МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ
ВІННИЦЬКИЙ НАЦІОНАЛЬНИЙ АГРАРНИЙ УНІВЕРСИТЕТ

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English for Computer Science Students

Методичні рекомендації для самостійної роботи з дисципліни «Іноземна мова» для студентів першого (бакалаврського) рівня вищої освіти галузі знань 12 «Інформаційні технології» спеціальності 122 «Комп'ютерні науки»

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Методичні рекомендації для самостійної роботи з дисципліни «Іноземна мова» для студентів першого (бакалаврського) рівня вищої освіти галузі знань 12 «Інформаційні технології » спеціальності 122 «Комп'ютерні науки» дають можливість перевірити ступінь засвоєння студентами основних граматичних і лексичних навичок, якість засвоєння студентами вивченого матеріалу за певний проміжок часу.

Методичні рекомендації формують навички читання, розуміння та перекладу фахових текстів, вивчення студентами термінології та лексичних одиниць в галузі інформаційних технологій. Рекомендації включають тексти для читання та словники для засвоєння лексичних одиниць.

Рекомендовано навчально-методичною комісією факультету
протокол №   від

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протокол №   від

Зміст

Передмова

Методичні рекомендації можуть бути використані для закладів вищої освіти, які здійснюють підготовку фахівців з комп'ютерних наук задля їхньої майбутньої роботи у галузі ІТ. Вони орієнтовані на студентів, які володіють англійською мовою у межах нормативної граматики й соціально-побутової лексики, і професійної лексики. Матеріали, які пропонуються для засвоєння, допоможуть удосконаленню умінь і навичок монологічного й діалогічного мовлення, оволодінню професійною лексикою, допоможуть отримати для такого спілкування інформацію з оригінальних англомовних джерел.

Методичні рекомендації складаються з 36 занять. Кожне заняття містить тексти за професійним спрямуванням та завдання. Навчальні завдання, які подані перед текстами, допомагають збудувати навички пошукового читання та спрямовані на обговорення прочитаного. Тексти, що знаходяться у методичних рекомендаціях, допоможуть оволодіти професійною лексикою, необхідною для спеціаліста з комп'ютерних наук, а також використовувати її у межах тем. Студенти вивчають мовленнєві формули, які допомагають їм у спілкуванні; розвивають вміння вести дискусію, переконати опонента у правильності своїх тверджень; вміння поставити запитання та дати правильну відвовідь з теми. Таким чином студенти навчаються працювати з незнайомими автентичними текстами.

Подані тексти відповідають вимогам програми дисципліни «Іноземна мова» і формують уміння студентів читати оригінальну літературу за спеціальностю для засвоєння нової інформації і подання її рідною мовою. До текстів створено завдання, спрямовані на розвиток умінь та навичок використання різних явищ іноземної мови. Методичне видання буде корисним для різних видів роботи. Воно призначине для того, щоб допомогти студентам у позааудиторній та аудиторній роботі над розвитком практичних навичок оволодіння іноземною мовою.

Методичні рекомендації розроблено на основі сучасних принципів навчання іноземній мові з урахуванням когнітивних і комунікативних потреб майбутнього фахівця з комп'ютерних наук.

Lesson 1. Information Technology: An Overview

1. Find the new words and word combinations.

2. Put different questions to the text.

3. Read, translate and retell the text.

4. Write the resume of the text in English.

Information technology (IT) is the use of computers, software, networks, and other devices to store, process, transmit, and access data and information. IT is a broad field that encompasses many aspects of human activity, such as communication, education, entertainment, business, health care, and security. IT has transformed the world in many ways, enabling faster and easier communication, access to vast amounts of information, automation of tasks, innovation of products and services, and improvement of quality of life. IT also poses some challenges, such as privacy, security, ethical, social, and environmental issues.

Some of the main areas of IT are:

Hardware: the physical components of a computer system, such as the central processing unit (CPU), memory, disk drives, keyboard, mouse, monitor, printer, scanner, etc. Software: the programs or applications that run on a computer system, such as the operating system (OS), word processor, spreadsheet, browser, game, etc. Networks: the systems that connect computers and other devices to each other and to the internet, using cables, wireless signals, routers, switches, servers, etc. Database: the organized collection of data that can be stored, retrieved, manipulated, and analyzed by software applications. Web: the global network of interconnected web pages and web applications that can be accessed by browsers using the internet protocol (IP).

Cloud computing: the delivery of computing services over the internet on demand, such as storage, processing, software, platforms, etc. Artificial intelligence (AI): the branch of computer science that deals with creating machines or systems that can perform tasks that normally require human intelligence or reasoning. Machine learning: a subset of AI that involves creating algorithms or models that can learn from data and improve their performance without explicit programming. Data science: the interdisciplinary field that combines mathematics, statistics, computer science, and domain knowledge to extract insights from data using various methods and tools. Internet of things (IoT): the network of physical objects or devices that are embedded with sensors, software, and connectivity to collect and exchange data over the internet.

Cybersecurity: the practice of protecting computer systems and networks from unauthorized access or attack by hackers or malicious software. These are just some examples of IT topics that are relevant and important in today's world. IT is constantly evolving and expanding as new technologies emerge and new applications are developed. IT professionals need to keep up with the latest trends and skills to stay competitive and innovative in their fields. IT also offers many opportunities for learning and career development for anyone who is interested in technology and its applications [16].

Lesson 2. Computer games.
1. Find the new words and word combinations.
2. Put different questions to the text.
3. Read, translate and retell the text.
4. Write the resume of the text in English.

In recent years, computer games have become an integral part of modern entertainment. With their immersive graphics, captivating storylines, and engaging gameplay, computer games have captured the hearts and minds of millions worldwide. In this article, we will delve into the fascinating world of computer games, exploring their history, the impact they have had on society, and the reasons why they continue to be a beloved form of entertainment.

A Brief History of Computer Games:

Computer games have come a long way since their humble beginnings. The roots of computer gaming can be traced back to the early 1950s when researchers at universities and tech companies began experimenting with simple games on mainframe computers. However, it was not until the 1970s that computer games gained popularity with the introduction of arcade games like Pong and Space Invaders. The advent of personal computers in the 1980s further propelled the growth of computer games, with titles like Pac-Man and Tetris captivating a wide audience. Since then, computer games have evolved dramatically, embracing advancements in technology, graphics, and gameplay mechanics, giving rise to an industry that generates billions of dollars in revenue each year.

The Impact of Computer Games:

Computer games have had a profound impact on society. They are no longer just a form of entertainment but have also become a medium for storytelling, social interaction, and even education. Through the immersive nature of computer games, players can explore fantastical worlds, solve complex puzzles, and engage in thrilling

adventures. Games have also become a platform for social interaction, with multiplayer experiences enabling players to connect and collaborate with others from around the globe. Moreover, computer games have found their way into educational settings, as they can be used to teach various subjects, enhance problem-solving skills, and foster creativity.

The Appeal of Computer Games:

What makes computer games so appealing? Firstly, they offer a form of escapism, allowing players to temporarily step into a different reality and become someone else, whether it's a fearless warrior, a cunning detective, or a talented sports star. Additionally, computer games provide a sense of achievement and progression as players overcome challenges and unlock new levels, abilities, or items. The competitive nature of many games also fuels the desire to improve and outperform others, driving players to master their skills. Furthermore, the multiplayer aspect of computer games fosters social connections, enabling players to forge friendships and collaborate on shared objectives.

Conclusion:

Computer games have revolutionized the entertainment industry, providing an immersive and interactive experience for players of all ages. From their humble beginnings to the present-day gaming industry, computer games have continuously evolved and captivated audiences worldwide. They offer a unique blend of storytelling, creativity, and social interaction, making them much more than a simple pastime. As technology continues to advance, it is exciting to ponder what the future holds for computer games and the endless possibilities they offer. So, grab your controller, embark on a virtual adventure, and let the captivating world of computer games unfold before your eyes![2]

Lesson 3. C++: The Powerful Language Shaping Modern Programming
1. Find the new words and word combinations.
2. Put different questions to the text.
3. Read, translate and retell the text.
4. Write the resume of the text in English.

C++ is a versatile and powerful programming language that has played a significant role in shaping the world of software development. Known for its efficiency, performance, and extensive features, C++ has become a popular choice among programmers. In this article, we will explore the origins of C++, its key features, and its impact on the programming landscape.

The Origins and Evolution of C++:

C++ traces its roots back to the early 1980s when Bjarne Stroustrup, a Danish computer scientist, sought to enhance the existing C programming language. Stroustrup aimed to introduce object-oriented programming (OOP) concepts into C to create a more robust and flexible language. The result was C++, which initially served as an extension of C. Over time, C++ evolved with the development of standardized versions, such as C++98, C++03, C++11, and subsequent iterations. These updates introduced new features, improved syntax, and enhanced the overall functionality of the language.

Key Features and Advantages of C++:

C++ offers a wide range of features that contribute to its popularity among programmers. Here are some key aspects:

a) Object-Oriented Programming (OOP): C++ supports OOP principles, allowing developers to create classes and objects, encapsulate data, and define relationships between them. This promotes code reusability, modularity, and easier maintenance.

b) Performance and Efficiency: C++ is known for its high performance and efficiency. It provides direct hardware access, manual memory management through pointers, and efficient compilation. These features make it an ideal choice for resource-intensive applications like gaming, graphics rendering, and system-level programming.

c) Standard Library: C++ comes with a comprehensive standard library that provides a vast array of pre-built functions and templates. This library covers a wide range of functionalities, including input/output operations, algorithms, data structures, and concurrency support, making development faster and more convenient.

d) Low-Level Control: C++ allows programmers to have precise control over hardware resources, memory allocation, and optimization. This level of control is particularly beneficial for tasks that demand fine-grained management and performance optimization.

The Impact of C++ on the Programming Landscape:

C++ has had a significant impact on various areas of software development:

a) Systems Programming: C++ is widely used for systems programming, where low-level control, performance, and efficient resource utilization are critical. It is the language of choice for developing operating systems, device drivers, embedded systems, and other software that interacts directly with hardware.

b) Game Development: The gaming industry heavily relies on C++ for its ability to handle complex graphics rendering, physics simulations, and real-time performance requirements. Many popular game engines, such as Unreal Engine and Unity, are built using C++.

c) High-Performance Computing: C++ is favored in domains like scientific computing, numerical analysis, and simulation. Its efficiency and ability to work with low-level memory access make it well-suited for computationally intensive applications.

d) Large-Scale Projects: C++ is often used in large-scale software projects that demand performance, scalability, and maintainability. Its support for modular programming and libraries enables the development of complex systems with multiple components.

Conclusion:

C++ stands as a powerful programming language that has shaped modern software development. Its ability to combine the advantages of low-level control with the flexibility and productivity of object-oriented programming makes it a versatile tool for a wide range of applications. As technology continues to evolve, C++ remains a vital language, providing programmers with the tools they need to build efficient, high-performance software solutions.[3]

Lesson 4. Python: Empowering Developers with Simplicity and Versatility
1. Find the new words and word combinations.
2. Put different questions to the text.
3. Read, translate and retell the text.
4. Write the resume of the text in English.

Python has emerged as one of the most popular programming languages in recent years. Known for its simplicity, readability, and versatility, Python has captured the hearts of developers worldwide. In this article, we will explore the origins of Python, its unique features, and the reasons why it has become the go-to language for a wide range of applications.

The Birth of Python:

Python was created in the late 1980s by Guido van Rossum, a Dutch programmer. Van Rossum aimed to develop a language that was easy to learn and use, with a focus on code readability and simplicity. The name "Python" was inspired by the British comedy series Monty Python's Flying Circus, showcasing the language's quirky and fun nature. Python's initial release in 1991 marked the

beginning of its journey towards becoming a powerful and widely adopted programming language.

Key Features and Advantages of Python:

Python offers several key features that contribute to its popularity among developers:

a) Readability and Simplicity: Python's syntax is designed to be easily readable and understandable, making it an excellent choice for both beginners and experienced programmers. Its use of indentation and clean syntax encourages code consistency and reduces the likelihood of errors.

b) Versatility: Python is a versatile language that can be used for various purposes. It provides extensive libraries and frameworks for web development (Django, Flask), scientific computing (NumPy, SciPy), data analysis (Pandas), machine learning (TensorFlow, PyTorch), and more. This versatility makes Python a preferred language across different domains.

c) Rich Ecosystem: Python has a vibrant and active community that continuously contributes to its ecosystem. The Python Package Index (PyPI) hosts a vast collection of open-source libraries and modules, which can be easily installed and integrated into projects. This ecosystem promotes code reuse, accelerates development, and facilitates collaboration among developers.

d) Cross-Platform Compatibility: Python is available on major operating systems, including Windows, macOS, and various Linux distributions. This cross-platform compatibility ensures that Python code can run seamlessly on different environments, expanding its reach and applicability.

Applications and Impact:

Python's versatility has led to its extensive usage across various domains:

a) Web Development: Python frameworks like Django and Flask have revolutionized web development, providing efficient tools for building robust and scalable web applications. Python's simplicity and ease of use make it a popular choice for both backend and frontend development.

b) Data Science and Machine Learning: Python has become the language of choice for data scientists and machine learning practitioners. Libraries such as NumPy, Pandas, and scikit-learn enable efficient data manipulation, analysis, and modeling. Frameworks like TensorFlow and PyTorch provide a foundation for building and training neural networks.

c) Automation and Scripting: Python's scripting capabilities make it ideal for automation tasks, such as file operations, system administration, and repetitive

processes. Its readability and simplicity enhance productivity and reduce development time for such tasks.

d) Education: Python's beginner-friendly nature and extensive learning resources have made it a popular language for teaching programming concepts. Its simplicity allows new programmers to quickly grasp fundamental concepts and build their skills.

Python has emerged as a powerful programming language that empowers developers with its simplicity, versatility, and rich ecosystem. Whether you're a beginner or an experienced programmer, Python offers a delightful coding experience, making it easier to turn ideas into reality. Its applications in web development, data science, machine learning, and automation continue to shape industries and drive innovation. With its ever-growing community and extensive libraries, Python is poised to remain a dominant force in the programming world for years to come. [24]

Lesson 5. Databases in IT: The Powerhouse of Data Management
1. Find the new words and word combinations.
2. Put different questions to the text.
3. Read, translate and retell the text.
4. Write the resume of the text in English.

In the vast landscape of information technology (IT), databases play a pivotal role in managing and organizing vast amounts of data. From small-scale applications to large enterprise systems, databases serve as the backbone of data storage, retrieval, and manipulation. This article explores the significance of databases in IT and their essential role in powering modern-day data management.

Databases are critical components of IT infrastructure, providing a structured and efficient way to store and manage data. They offer a centralized repository where information can be organized, accessed, and updated. Databases enable businesses to make informed decisions, streamline operations, and enhance productivity by ensuring data integrity and reliability.

There are various types of databases, each designed to cater to specific needs and use cases. Relational databases, the most commonly used type, organize data into tables with defined relationships between them. NoSQL databases, on the other hand, provide flexible data models suitable for handling unstructured or semi-structured data. Additionally, there are graph databases, document databases, and columnar databases, each optimized for specific data management requirements.

To interact with databases effectively, organizations utilize Database Management Systems (DBMS). These software applications provide a set of tools and interfaces to manage databases, perform queries, enforce security measures, and ensure data consistency. Popular DBMSs include MySQL, Oracle Database, Microsoft SQL Server, and PostgreSQL, among others.

In the realm of IT, data security and integrity are of utmost importance. Databases employ robust security measures to protect sensitive information from unauthorized access, ensuring data privacy and compliance with regulations. Additionally, features such as data backups, replication, and disaster recovery mechanisms help maintain data integrity and availability even in the face of unexpected events.

As data volumes continue to grow exponentially, databases must be scalable to handle increasing workloads. Scalability ensures that databases can accommodate additional data and users without compromising performance. Techniques such as database partitioning, clustering, and distributed architectures enable organizations to scale their databases as needed, ensuring optimal performance even under high-demand scenarios.

In the ever-expanding world of IT, databases serve as the powerhouse of data management. Their ability to store, organize, and retrieve information efficiently is essential for businesses to thrive in the digital age. By leveraging the right database technologies, organizations can unlock the full potential of their data, drive innovation, and gain a competitive edge. As data continues to fuel the IT landscape, the importance of robust database management practices will only continue to grow. [37]

Lesson 6. The Role of UX Design in Creating User-Centric Digital Experiences
    1. Find the new words and word combinations.
    2. Put different questions to the text.
    3. Read, translate and retell the text.
    4. Write the resume of the text in English.

In today's digital landscape, user experience (UX) design plays a pivotal role in shaping the success of digital products and services. UX design focuses on understanding the needs, behaviors, and preferences of users to create intuitive, engaging, and enjoyable experiences. Whether it's a website, mobile app, or software interface, the goal of UX design is to ensure that users can easily navigate, interact with, and derive value from digital platforms.

One of the key principles of UX design is user research. By conducting thorough research, UX designers gather insights into user demographics, motivations, and pain points. This information serves as a foundation for designing user personas and user journey maps, which help guide the creation of tailored digital experiences. By empathizing with users and understanding their goals, UX designers can design interfaces that meet their needs and exceed their expectations.

Another crucial aspect of UX design is information architecture. This involves organizing and structuring content in a logical and intuitive manner. UX designers focus on creating clear navigation systems, intuitive menus, and meaningful categorization to help users easily find the information they need. By simplifying complex information and providing clear pathways, UX designers enhance the usability of digital platforms.

Visual design is also a vital component of UX design. By leveraging principles of graphic design, color theory, and typography, UX designers create visually appealing interfaces that align with the brand's identity and resonate with the target audience. Attention is given to aesthetics, layout, and visual hierarchy to guide users' attention and create a visually pleasing experience. Effective use of visuals, such as icons, images, and illustrations, can enhance understanding, evoke emotions, and improve overall engagement.

Usability testing and user feedback are integral parts of the UX design process. By conducting usability tests, UX designers can identify usability issues, gather insights, and validate design decisions. User feedback, whether through surveys, interviews, or analytics data, provides valuable input for refining and iterating on the design. UX designers continuously strive to improve the digital experience based on real user feedback, ensuring that the end product meets users' needs and expectations.

In conclusion, UX design plays a crucial role in creating user-centric digital experiences. By understanding user needs, designing intuitive interfaces, and continuously iterating based on user feedback, UX designers ensure that digital products and services provide exceptional user experiences, increase customer satisfaction, and drive business success.[25]

Lesson 7. C#: Empowering Developers with Versatility and Productivity

1. Find the new words and word combinations.

2. Put different questions to the text.

3. Read, translate and retell the text.

4. Write the resume of the text in English.

C# (pronounced "C sharp") is a versatile and modern programming language that has gained significant popularity in the software development industry. Developed by Microsoft, C# provides a robust and efficient framework for building a wide range of applications. In this article, we will explore the features, applications, and advantages of C# in empowering developers to create powerful and scalable software solutions.

Key Features and Advantages of C#:

C# offers several key features that make it a preferred choice among developers:

a) Object-Oriented Programming (OOP): C# supports OOP principles, allowing developers to create classes, objects, and encapsulate data and behavior. This promotes code reusability, modularity, and easier maintenance.

b) Platform Independence: C# is designed to be platform-independent, thanks to the .NET framework. Applications written in C# can be run on various platforms, including Windows, macOS, and Linux. This cross-platform compatibility enables developers to target a wide range of devices and environments.

c) Memory Management: C# utilizes automatic memory management through a process called garbage collection. This eliminates the need for manual memory management, making it easier to write secure and efficient code.

d) Extensive Frameworks and Libraries: C# benefits from the extensive .NET framework and a rich ecosystem of libraries and frameworks. This ecosystem provides developers with pre-built components, tools, and APIs for tasks such as user interface development, database access, networking, and more. It accelerates development, improves productivity, and ensures code quality.

Applications and Use Cases:

C# finds application in various domains, including:

a) Desktop Applications: C# is commonly used for developing desktop applications, leveraging frameworks like Windows Presentation Foundation (WPF) and Windows Forms. These frameworks provide developers with powerful tools for creating visually appealing and interactive user interfaces.

b) Web Development: C# can be used for web development through frameworks like ASP.NET and ASP.NET Core. These frameworks enable developers to build scalable and high-performance web applications and APIs. C# integrates seamlessly with HTML, CSS, and JavaScript, facilitating a smooth client-server interaction.

c) Game Development: C# is a popular choice for game development, especially with the Unity game engine. Unity offers extensive support for C#, allowing developers to create cross-platform games with ease. The combination of C#'s performance and Unity's features makes it a compelling option for game developers.

d) Mobile Development: C# is utilized in mobile development through frameworks like Xamarin and .NET MAUI. These frameworks enable developers to build cross-platform mobile applications for iOS and Android using C#. Code sharing and reuse across platforms reduce development time and effort.

Community Support and Future Prospects:

C# has a vibrant and active developer community. Developers can access extensive documentation, tutorials, forums, and open-source projects. This community support fosters collaboration, knowledge sharing, and continuous learning.

C# continues to evolve with new language features and improvements introduced in each version. Microsoft's commitment to the language ensures its relevance and continued adoption in the future. The strong integration with the .NET ecosystem and the support of Microsoft make C# a promising choice for developers.[4]

Lesson 8. JavaScript: Computer Components: Building Blocks of Modern Computing

1. Find the new words and word combinations.

2. Put different questions to the text.

3. Read, translate and retell the text.

4. Write the resume of the text in English.

Computers have become an integral part of our daily lives, powering everything from personal devices to complex server systems. Behind the sleek exteriors and user-friendly interfaces lie a multitude of components that work together to make computing possible. Understanding the key components of a

computer is essential to grasp the inner workings and unleash the full potential of these machines.

Central Processing Unit (CPU):

The CPU is often referred to as the brain of the computer. It carries out instructions and performs calculations required for running software and executing tasks. The CPU consists of an arithmetic logic unit (ALU) for mathematical operations, control unit for instruction interpretation, and cache memory for temporary data storage. Random Access Memory (RAM):

RAM, or system memory, serves as the computer's short-term storage. It stores data that the CPU needs to access quickly, such as running applications, operating system processes, and temporary files. RAM is volatile memory, meaning its contents are lost when the computer is powered off or restarted.

Hard Disk Drive (HDD) or Solid State Drive (SSD):

HDDs and SSDs are the primary storage devices in computers. HDDs use spinning magnetic disks to store data, while SSDs rely on flash memory technology. Both provide long-term storage for operating systems, software, files, and documents. HDDs generally offer larger storage capacities, while SSDs provide faster data access speeds.

Motherboard: The motherboard is a circuit board that serves as the foundation for all computer components. It houses connectors, slots, and sockets for connecting the CPU, RAM, storage devices, and other peripherals. The motherboard also includes chipset components that facilitate communication between different parts of the computer.

Graphics Processing Unit (GPU):

The GPU is responsible for rendering images, videos, and animations. It excels at parallel processing, making it essential for gaming, video editing, and other graphically intensive tasks. Modern GPUs also support general-purpose computing, enabling their utilization in artificial intelligence, machine learning, and scientific simulations. Power Supply Unit (PSU):

The PSU converts electrical power from the outlet into usable energy for the computer. It provides stable and regulated voltages to all components, ensuring their proper functioning. The PSU's wattage should be appropriate for the power requirements of the computer to avoid instability or insufficient power supply.

Input and Output Devices:

Input devices, such as keyboards and mice, allow users to interact with the computer by providing input. Output devices, such as monitors and printers, display

or produce information generated by the computer. Other input and output devices include scanners, speakers, webcams, and microphones, expanding the capabilities of computer systems. Expansion Cards:

Expansion cards are optional components that can be added to enhance a computer's functionality. Graphics cards, sound cards, network interface cards, and storage controllers are common examples. These cards are inserted into expansion slots on the motherboard, allowing users to upgrade or customize their systems according to specific needs.[21]

Lesson 9. 3D Modeling: 3d modeling as a way to display objects, people, etc. in the form of a 3D model

1. Find the new words and word combinations.

2. Put different questions to the text.

3. Read, translate and retell the text.

4. Write the resume of the text in English.

3D modeling is the process of creating three-dimensional digital representations of objects or environments using specialized software. It involves constructing and manipulating geometric shapes, textures, and materials to create realistic or stylized 3D models. These models can be used in various industries such as video games, film and animation, architecture, product design, and more.

3D modeling allows artists and designers to bring their ideas to life in a virtual space. By sculpting and shaping digital objects, they can create intricate details, realistic textures, and complex animations. The process typically involves using a combination of tools and techniques, including polygonal modeling, NURBS modeling, sculpting, and procedural modeling.

In the world of 3D modeling, artists often start with a concept or reference image and then begin creating a basic shape or structure using primitive shapes like cubes, spheres, or cylinders. They refine and add detail to the model by manipulating vertices, edges, and faces. Texturing involves applying images or materials to the surface of the model to enhance its appearance and realism. Lighting and shading techniques are used to create realistic lighting conditions and simulate the interaction of light with different materials.

The resulting 3D models can be further enhanced with the application of rigging and animation. Rigging involves creating a digital skeleton for the model, enabling it to be posed and animated. Animators can then bring the model to life by creating movement and sequences of actions.[10]

Lesson 10. The internet has revolutionized the way we live

1. Find the new words and word combinations.

2. Put different questions to the text.

3. Read, translate and retell the text.

4. Write the resume of the text in English.

The Internet has revolutionized the way we communicate, access information, and interact with the world. It is a vast global network of interconnected computers, enabling seamless connectivity and facilitating the exchange of data and ideas. Let's explore the significance of the Internet:

Global Connectivity:

The Internet has bridged the geographical divide, connecting individuals, communities, businesses, and governments across the globe. It has transformed the way we communicate, allowing instant messaging, video calls, and social media interactions. The Internet has made the world a smaller place, fostering a sense of global community and enabling collaboration on an unprecedented scale.

Access to Information:

The Internet is an immense repository of information, providing access to a wealth of knowledge at our fingertips. Search engines, online encyclopedias, digital libraries, and educational platforms have democratized information, empowering individuals to learn, explore, and broaden their horizons. The Internet has transformed the way we acquire knowledge, conduct research, and stay informed about global events.

E-Commerce and Online Services:

The Internet has revolutionized the way we shop and access services. E-commerce platforms allow us to purchase products from around the world with a few clicks, while online services provide convenience in areas such as banking, entertainment streaming, food delivery, and travel bookings. The Internet has transformed traditional business models, creating new opportunities and enhancing consumer experiences.

Communication and Social Networking:

Social media platforms and communication apps have become an integral part of our lives, connecting us with friends, family, and like-minded individuals. The Internet has transformed how we interact, share experiences, and build communities. It has given individuals a voice and a platform to express themselves, fostering connectivity and fostering social change.

Digital Entertainment and Media:

The Internet has revolutionized entertainment and media consumption. Streaming services offer instant access to a vast library of movies, TV shows, music, and podcasts. Online gaming has become a global phenomenon, connecting players from different parts of the world in immersive virtual worlds. The Internet has transformed the way we consume and create content, blurring the lines between creators and consumers.

Collaboration and Innovation:

The Internet has facilitated collaboration and innovation on a global scale. Online platforms and tools enable teams to collaborate remotely, driving productivity and creativity. Open-source communities encourage developers to contribute to shared projects, resulting in rapid technological advancements. The Internet has become a hub for innovation, providing a platform for individuals and organizations to collaborate and bring ideas to life.

Empowerment and Digital Divide:

While the Internet has brought numerous benefits, it is essential to address the digital divide, ensuring that everyone has access to its opportunities. Efforts are being made to bridge this gap and provide equal access to education, information, and online services. Bridging the digital divide is crucial for empowering individuals, reducing inequalities, and creating a more inclusive society.

The Internet has transformed the way we live, work, and connect with others. Its global reach, vast information resources, and transformative power have made it an integral part of our daily lives. As we continue to navigate the digital landscape, the Internet will play an increasingly central role, shaping our future and fostering new possibilities in communication, innovation, and global connectivity.[5]

Lesson 11. Computer Technologies in Agriculture
1. Find the new words and word combinations.
2. Put different questions to the text.
3. Read, translate and retell the text.
4. Write the resume of the text in English.

Computer technologies have revolutionized various industries, including agriculture. The integration of computers, software, and advanced sensors has transformed traditional farming practices, making them more efficient, precise, and sustainable. From crop management to livestock monitoring, computer technologies play a crucial role in modern agricultural processes.

One of the key applications of computer technologies in agriculture is precision farming. Farmers utilize GPS systems, remote sensing, and geographic information systems (GIS) to analyze and map their fields. This data enables them to optimize the use of resources, such as water, fertilizers, and pesticides, based on the specific needs of different areas within the field. By precisely targeting inputs, farmers can reduce waste, improve crop yields, and minimize environmental impact.

Another area where computer technologies have made significant advancements is in the realm of agricultural machinery and automation. Farm equipment now comes equipped with sophisticated sensors, actuators, and onboard computers that enable precise operations, such as automated planting, spraying, and harvesting. These technologies enhance productivity, reduce labor requirements, and ensure consistent and accurate farm operations.

Furthermore, computer technologies play a vital role in livestock management. Farmers can utilize software systems to monitor animal health, track feeding schedules, and optimize breeding programs. Automated data collection and analysis help identify potential health issues, optimize feed formulas, and improve overall animal welfare.

In addition, computer-based decision support systems provide farmers with real-time information and analysis for making informed decisions. Weather forecasting, pest and disease modeling, and market trends analysis assist farmers in optimizing planting schedules, disease prevention strategies, and market positioning.

The benefits of computer technologies in agriculture extend beyond individual farms. Data collection and analysis across multiple farms and regions enable the development of large-scale predictive models and decision support systems. This data-driven approach allows for better resource allocation, risk management, and policy planning at the regional and national levels.

While computer technologies bring numerous advantages to the agricultural sector, it's important to ensure access and training for all farmers, regardless of their resources or location. Bridging the digital divide and providing technical support are crucial for maximizing the potential of computer technologies in agriculture and ensuring sustainable and equitable growth in the industry.[6]

Lesson 12. Security in the Internet of Things: Protecting against cyberattacks and data breaches

1. Find the new words and word combinations.

2. Put different questions to the text.

3. Read, translate and retell the text.

4. Write the resume of the text in English.

The rapid growth of the Internet of Things (IoT) has brought numerous benefits and convenience to our daily lives. From smart homes and wearable devices to industrial sensors and autonomous vehicles, IoT technology has revolutionized how we interact with the world around us. However, this interconnectedness also presents significant security challenges. With billions of devices collecting and exchanging data, the risk of cyberattacks and data breaches is a pressing concern. In this article, we will explore the importance of security in the Internet of Things and discuss strategies to protect against these threats.

Understanding the IoT Security Landscape:

The IoT ecosystem encompasses a wide range of devices, networks, and platforms, creating a complex security landscape. Each device, from smart thermostats to medical implants, can potentially become an entry point for cyberattacks. Therefore, it is crucial to understand the various components and vulnerabilities within the IoT infrastructure to implement effective security measures.

Common IoT Security Risks:

Cyberattacks in the IoT realm can lead to severe consequences, including privacy breaches, unauthorized access, and disruption of critical systems. Some common security risks include:

a. Weak Authentication and Authorization: Many IoT devices lack robust authentication mechanisms, making them vulnerable to unauthorized access.

b. Inadequate Encryption: Insufficient encryption can expose sensitive data during transmission, making it susceptible to interception and manipulation.

c. Firmware Vulnerabilities: Outdated or insecure firmware in IoT devices can be exploited by attackers to gain control over the device or launch attacks on other systems.

d. Lack of Security Updates: The long lifespan of IoT devices often leads to a lack of regular security updates, leaving them exposed to known vulnerabilities.

Strategies for IoT Security:

To mitigate the risks associated with the IoT, robust security measures must be implemented. Some essential strategies include:

a. Strong Authentication and Access Control: Implementing secure authentication mechanisms and access control protocols ensures that only authorized entities can interact with IoT devices.

b. Data Encryption and Integrity: Encrypting data at rest and in transit, as well as verifying its integrity, prevents unauthorized access and tampering.

c. Regular Security Updates: Manufacturers should provide regular firmware updates to patch vulnerabilities and address security flaws.

d. Intrusion Detection and Prevention Systems: Deploying intrusion detection and prevention systems helps identify and mitigate attacks in real-time.

e. Security Audits and Risk Assessments: Conducting regular security audits and risk assessments helps identify potential vulnerabilities and develop appropriate mitigation strategies.

As the Internet of Things continues to evolve and expand, ensuring robust security measures is paramount. By understanding the IoT security landscape, recognizing common risks, and implementing effective strategies, we can protect against cyberattacks and data breaches. With a proactive approach to IoT security, we can harness the full potential of this transformative technology while safeguarding our privacy and digital assets.[26]

Lesson 13. The Rise of Cybersecurity: Protecting Data in the Digital Age
1. Find the new words and word combinations.
2. Put different questions to the text.
3. Read, translate and retell the text.
4. Write the resume of the text in English.

In the era of rapid digital transformation, the importance of cybersecurity has reached unprecedented heights. With the increasing volume of data generated and exchanged online, protecting sensitive information has become a paramount concern for individuals, organizations, and governments alike. The rise of cybersecurity has emerged as a crucial defense mechanism against the ever-evolving landscape of cyber threats. This article delves into the significance of cybersecurity and the measures taken to safeguard data in the digital age.

Cybersecurity refers to the practice of protecting computer systems, networks, and data from unauthorized access, theft, damage, or disruption. In today's interconnected world, where information flows across borders and devices, the stakes for safeguarding sensitive data have never been higher. Cybersecurity plays a pivotal role in preserving the integrity, confidentiality, and availability of digital assets. It

encompasses a range of technologies, processes, and best practices aimed at mitigating risks and ensuring a secure digital environment.

As technology advances, so do the tactics employed by cybercriminals. The digital landscape is plagued by a myriad of cyber threats, including malware, ransomware, phishing attacks, data breaches, and identity theft. These threats pose significant risks to individuals, businesses, and critical infrastructure systems. Cybersecurity measures are constantly evolving to combat these emerging threats and prevent potential damage.

To combat cyber threats effectively, organizations and individuals must implement robust cybersecurity measures. This includes adopting secure authentication mechanisms, employing encryption to protect data in transit and at rest, implementing firewalls and intrusion detection systems, regularly updating software and operating systems, and conducting cybersecurity awareness and training programs. Additionally, proactive monitoring, incident response plans, and regular security assessments are crucial components of a comprehensive cybersecurity strategy.

Addressing the complex and ever-changing cybersecurity landscape requires collaboration among stakeholders. Governments, private sector entities, and international organizations are working together to develop cybersecurity frameworks, standards, and regulations. These initiatives aim to establish guidelines for secure practices, promote information sharing, and enhance incident response capabilities. Collaboration is key to staying ahead of cyber threats and ensuring the protection of data on a global scale

In the digital age, cybersecurity has become an imperative aspect of our daily lives. The rise of cyber threats necessitates robust measures to protect sensitive data from unauthorized access and malicious activities. As technology continues to evolve, the importance of cybersecurity will only grow. By implementing effective cybersecurity practices, embracing collaboration, and staying informed about emerging threats, we can navigate the digital landscape with confidence, safeguard our data, and embrace the countless opportunities offered by the digital world. [29]

Lesson 14. Software Testing and Quality Assurance: Ensuring Reliable, Error-Free Applications

1. Find the new words and word combinations.

2. Put different questions to the text.

3. Read, translate and retell the text.

4. Write the resume of the text in English.

In the rapidly evolving world of software development, the demand for reliable and high-quality applications has never been greater. This is where software testing and quality assurance play a crucial role. They are essential processes that ensure the integrity, functionality, and performance of software, ultimately delivering a seamless user experience.

Software testing involves systematically examining and evaluating software components to identify any defects or errors. It aims to uncover bugs, glitches, and inconsistencies that may impact the functionality or user experience of the application. By conducting thorough testing, developers can identify and rectify issues before the software is released to the end-users.

Quality assurance, on the other hand, is a broader discipline that encompasses the entire software development lifecycle. It focuses on establishing and implementing standards, processes, and methodologies to ensure the overall quality of the software. Quality assurance activities include defining quality metrics, conducting audits, and enforcing best practices to maintain consistency and reliability throughout the development process.

The importance of software testing and quality assurance cannot be overstated. They help mitigate risks and prevent costly errors by identifying and addressing issues early in the development cycle. Through a comprehensive range of testing techniques, such as functional testing, performance testing, security testing, and user acceptance testing, software quality is assured across various dimensions.

Effective software testing and quality assurance require a well-defined strategy and a range of tools and frameworks. Testers utilize automated testing tools, test management systems, and defect tracking systems to streamline the testing process and ensure efficient collaboration among team members. Continuous integration and continuous testing methodologies further enhance the effectiveness and agility of the testing process.

By ensuring the reliability and quality of software, organizations can build trust with their users and deliver products that meet or exceed their expectations. Robust testing practices lead to improved customer satisfaction, reduced support costs, and

enhanced brand reputation. Furthermore, in industries with strict regulatory requirements, such as healthcare or finance, software testing and quality assurance are critical for compliance and data security.

In conclusion, software testing and quality assurance are indispensable processes in the software development lifecycle. They ensure the delivery of reliable, error-free applications by identifying and resolving issues before deployment. By investing in thorough testing practices and implementing robust quality assurance methodologies, organizations can create software products that inspire confidence and deliver exceptional user experiences.[22]

Lesson 15. JavaScript: The Language of Web Development
1. Find the new words and word combinations.
2. Put different questions to the text.
3. Read, translate and retell the text.
4. Write the resume of the text in English.

JavaScript, often abbreviated as JS, is a high-level, interpreted programming language. It was created by Brendan Eich in 1995 and has since become one of the most widely used languages for web development. JavaScript allows developers to add functionality and interactivity to web pages by manipulating the Document Object Model (DOM) and responding to user events.

Key Features and Capabilities:

Client-Side Scripting: JavaScript is primarily used as a client-side scripting language, meaning it runs on the user's web browser rather than the server. This enables dynamic content updates, form validation, and user interaction without requiring page reloads.

Cross-Platform Compatibility: JavaScript works seamlessly across different platforms and browsers, including Chrome, Firefox, Safari, and Edge. This versatility makes it an ideal choice for building responsive and user-friendly web applications. Frameworks and Libraries: JavaScript has a vast ecosystem of frameworks and libraries that enhance its capabilities. Popular libraries like React.js, Angular.js, and Vue.js enable developers to build complex and scalable web applications efficiently. Asynchronous Programming: JavaScript supports asynchronous programming through its event-driven, non-blocking nature. This allows developers to write code that can handle multiple tasks simultaneously, improving performance and responsiveness.

Integration with HTML and CSS: JavaScript seamlessly integrates with HTML and CSS, allowing developers to manipulate and modify the structure, style, and content of web pages. This trio of technologies (HTML, CSS, and JavaScript) forms the foundation of modern web development.

Use Cases:

JavaScript finds application in various domains and use cases, including: Dynamic Web Pages: JavaScript enables real-time updates and interactivity on websites, providing a richer user experience.

Web Applications: JavaScript, along with frameworks like React and Angular, powers the development of sophisticated web applications, including single-page applications (SPAs) and progressive web apps (PWAs).

Browser Extensions: JavaScript can be used to create browser extensions that enhance the functionality of web browsers. Server-Side Development: With the advent of Node.js, JavaScript can also be used for server-side development, allowing developers to build full-stack applications using a single language.

JavaScript is a versatile and powerful programming language that revolutionizes the way we interact with websites and web applications. With its extensive capabilities and vibrant ecosystem, JavaScript empowers developers to create dynamic, responsive, and engaging web experiences. Whether you're a beginner or an experienced developer, mastering JavaScript is essential to thrive in the ever-evolving world of web development.[20]

Lesson 16. The Significance of Computers: Empowering the Digital Age
1. Find the new words and word combinations.
2. Put different questions to the text.
3. Read, translate and retell the text.
4. Write the resume of the text in English.

Computers have become indispensable tools in our modern world, transforming the way we live, work, communicate, and access information. Their significance cannot be overstated, as they have revolutionized numerous industries and have become an integral part of our daily lives. Here are some key aspects highlighting the importance of computers.

Enhanced Efficiency and Productivity:

Computers have dramatically increased efficiency and productivity across various sectors. Tasks that once required hours or even days to complete can now be done in minutes or seconds. From data analysis and complex calculations to

document creation and communication, computers have streamlined processes and empowered individuals and organizations to achieve more in less time.

Global Connectivity:

Computers, coupled with the power of the internet, have connected people from different corners of the world like never before. They have transformed communication, enabling instant messaging, video calls, and social media interactions that transcend geographical boundaries. Computers have made it possible to share knowledge, collaborate on projects, and connect with individuals from diverse backgrounds, fostering a global community.

Access to Information:

The advent of computers has revolutionized information access. With just a few clicks, we can access vast amounts of information and resources from around the globe. From online encyclopedias and digital libraries to educational platforms and research databases, computers have democratized knowledge and provided opportunities for lifelong learning.

Transformation of Industries:

Computers have transformed industries across the board. From manufacturing and logistics to healthcare and finance, computers have automated processes, optimized operations, and enabled innovations. They have facilitated precision in manufacturing, accelerated research and development, improved patient care, revolutionized financial transactions, and opened up new avenues for creativity and entrepreneurship.

Creative Expression and Entertainment:

Computers have unleashed the potential for creative expression and entertainment. From graphic design and digital art to music production and video editing, computers have provided tools and platforms for individuals to showcase their talents. Additionally, computers have revolutionized the entertainment industry, enabling immersive gaming experiences, online streaming, and digital content consumption.

Scientific and Technological Advancements:

Computers have played a pivotal role in scientific and technological advancements. They have facilitated complex simulations, data analysis, and modeling, leading to breakthroughs in various fields such as medicine, engineering, and environmental science. Computers have also driven innovation in emerging technologies like artificial intelligence, machine learning, and robotics, pushing the boundaries of what is possible.

The significance of computers in our lives cannot be overstated. They have revolutionized the way we work, communicate, learn, and entertain ourselves. Computers continue to drive innovation and shape our future, offering endless possibilities and empowering individuals and societies to thrive in the digital age.[30]

Lesson 17. The Internet: Connecting the World in a Digital Web

1. Find the new words and word combinations.

2. Put different questions to the text.

3. Read, translate and retell the text.

4. Write the resume of the text in English.

The Internet has revolutionized the way we communicate, access information, and interact with the world. It is a vast global network of interconnected computers, enabling seamless connectivity and facilitating the exchange of data and ideas. Let's explore the significance of the Internet:

Global Connectivity:

The Internet has bridged the geographical divide, connecting individuals, communities, businesses, and governments across the globe. It has transformed the way we communicate, allowing instant messaging, video calls, and social media interactions. The Internet has made the world a smaller place, fostering a sense of global community and enabling collaboration on an unprecedented scale.

Access to Information:

The Internet is an immense repository of information, providing access to a wealth of knowledge at our fingertips. Search engines, online encyclopedias, digital libraries, and educational platforms have democratized information, empowering individuals to learn, explore, and broaden their horizons. The Internet has transformed the way we acquire knowledge, conduct research, and stay informed about global events.

E-Commerce and Online Services:

The Internet has revolutionized the way we shop and access services. E-commerce platforms allow us to purchase products from around the world with a few clicks, while online services provide convenience in areas such as banking, entertainment streaming, food delivery, and travel bookings. The Internet has transformed traditional business models, creating new opportunities and enhancing consumer experiences.

Communication and Social Networking:

Social media platforms and communication apps have become an integral part of our lives, connecting us with friends, family, and like-minded individuals. The Internet has transformed how we interact, share experiences, and build communities. It has given individuals a voice and a platform to express themselves, fostering connectivity and fostering social change.

Digital Entertainment and Media:

The Internet has revolutionized entertainment and media consumption. Streaming services offer instant access to a vast library of movies, TV shows, music, and podcasts. Online gaming has become a global phenomenon, connecting players from different parts of the world in immersive virtual worlds. The Internet has transformed the way we consume and create content, blurring the lines between creators and consumers.

Collaboration and Innovation:

The Internet has facilitated collaboration and innovation on a global scale. Online platforms and tools enable teams to collaborate remotely, driving productivity and creativity. Open-source communities encourage developers to contribute to shared projects, resulting in rapid technological advancements. The Internet has become a hub for innovation, providing a platform for individuals and organizations to collaborate and bring ideas to life.

Empowerment and Digital Divide:

While the Internet has brought numerous benefits, it is essential to address the digital divide, ensuring that everyone has access to its opportunities. Efforts are being made to bridge this gap and provide equal access to education, information, and online services. Bridging the digital divide is crucial for empowering individuals, reducing inequalities, and creating a more inclusive society.

The Internet has transformed the way we live, work, and connect with others. Its global reach, vast information resources, and transformative power have made it an integral part of our daily lives. As we continue to navigate the digital landscape, the Internet will play an increasingly central role, shaping our future and fostering new possibilities in communication, innovation, and global connectivity.[31]

Lesson 18. Drones: Revolutionizing the Way We Explore and Innovate

1. Find the new words and word combinations.

2. Put different questions to the text.

3. Read, translate and retell the text.

4. Write the resume of the text in English.

Drones, also known as unmanned aerial vehicles (UAVs), have emerged as game-changers in various industries, transforming the way we gather information, capture breathtaking visuals, and conduct tasks that were once deemed challenging or dangerous. Let's delve into the world of drones and their profound impact:

Aerial Exploration and Photography:

Drones have revolutionized aerial exploration, providing a bird's-eye view of our surroundings. Equipped with high-resolution cameras and stabilizing technologies, drones capture stunning aerial photographs and videos. They enable photographers, filmmakers, and hobbyists to capture perspectives that were previously only accessible by helicopters or planes. Drones have opened up new creative possibilities in visual storytelling and have become indispensable tools in industries such as filmmaking, real estate, and tourism.

Precision Agriculture and Environmental Monitoring:

Drones have transformed the agricultural landscape by enhancing precision farming techniques. Equipped with sensors and imaging technology, drones can assess crop health, detect pests, and monitor irrigation systems. This data-driven approach optimizes crop yield, reduces resource usage, and improves sustainability. Drones also contribute to environmental monitoring by surveying landscapes, detecting forest fires, and tracking wildlife populations, aiding in conservation efforts.

Infrastructure Inspection and Maintenance:

Drones have revolutionized infrastructure inspection, making it safer, more efficient, and cost-effective. They can navigate complex structures such as bridges, power lines, and pipelines, capturing detailed imagery and identifying areas that require maintenance or repair. By replacing manual inspections that often involve risks and time-consuming processes, drones minimize downtime, enhance worker safety, and reduce costs in industries like construction, energy, and transportation.

Emergency Response and Disaster Management:

Drones have proven invaluable in emergency response and disaster management scenarios. Equipped with thermal cameras and specialized sensors, they can quickly survey disaster-stricken areas, identify survivors, and assess damage.

Drones provide real-time situational awareness, enabling first responders to make informed decisions and coordinate rescue operations more effectively. They play a vital role in search and rescue missions, post-disaster assessments, and environmental monitoring during emergencies.

Delivery and Logistics:

The use of drones in delivery and logistics has gained significant attention in recent years. With the ability to navigate challenging terrains and bypass traffic, drones offer a promising solution for last-mile deliveries. They can transport small packages, medical supplies, and even food to remote or inaccessible areas, providing faster and more efficient services. Drones have the potential to revolutionize the logistics industry by reducing delivery times, minimizing carbon emissions, and reaching previously underserved locations.

Recreational and Competitive Drone Racing:

Drones have captured the imagination of hobbyists and enthusiasts worldwide. Drone racing has emerged as a popular sport, combining piloting skills, speed, and technology. Enthusiasts build and customize their drones, compete in thrilling races, and showcase their piloting abilities. Recreational drone flying has become a favorite pastime for many, offering a unique perspective and an adrenaline-fueled experience.

Ethical Considerations and Regulation:

As the use of drones continues to expand, ethical considerations and regulatory frameworks play a crucial role. Privacy concerns, airspace regulations, and safety protocols need to be carefully addressed to ensure responsible drone usage. Governments and aviation authorities are actively developing guidelines to maintain safety standards, protect privacy rights, and facilitate the integration of drones into existing airspace systems.

Drones have revolutionized industries, expanded possibilities, and provided innovative solutions to complex challenges. As technology continues to advance, the potential for drones is vast, with applications ranging from entertainment and exploration to humanitarian aid and scientific research. Embracing responsible drone usage and fostering innovation will pave the way for a future where drones continue to shape our world for the better.[11]

Lesson 19. CNC Machine Programming: Precision in Motion

1. Find the new words and word combinations.

2. Put different questions to the text.

3. Read, translate and retell the text.

4. Write the resume of the text in English.

CNC (Computer Numerical Control) machines have revolutionized the manufacturing industry by providing precise and automated control over various machining operations. CNC machine programming is the art of creating instructions that guide these machines to perform specific tasks with accuracy and efficiency. It involves a combination of technical skills, knowledge of machining principles, and proficiency in programming languages.

Key Components of CNC Machine Programming:

CAD/CAM Software: CNC programming begins with the use of Computer-Aided Design (CAD) and Computer-Aided Manufacturing (CAM) software. CAD software allows engineers and designers to create 2D or 3D digital models of the desired part or product. CAM software then translates these models into machine-readable code, generating toolpaths and instructions for the CNC machine.

G-Code: G-Code is the standard programming language used to control CNC machines. It consists of a series of commands that specify the machine's movements, tooling operations, feed rates, and other parameters. CNC programmers must have a deep understanding of G-Code and its syntax to effectively program the machines.

Tooling Selection: CNC machine programming involves selecting the appropriate tools for each machining operation. This includes choosing the right cutting tools, drill bits, end mills, and other tooling accessories based on the material being machined and the desired outcome. The programmer must consider factors such as tool geometry, tool life, and cutting parameters to ensure optimal performance.

Machining Parameters: CNC machine programmers must define the machining parameters for each operation, including cutting speeds, spindle speeds, feed rates, and depth of cuts. These parameters are crucial for achieving the desired accuracy, surface finish, and overall productivity. Optimization of these parameters requires a deep understanding of material properties and machining principles.

Benefits of CNC Machine Programming:

Precision and Accuracy: CNC machine programming enables precise and repeatable machining operations, resulting in high-quality finished products. The

automated nature of CNC machines eliminates the potential for human error, ensuring consistent and accurate results.

Increased Efficiency: CNC machine programming allows for efficient utilization of machine time and resources. With optimized toolpaths and programming techniques, manufacturers can minimize setup and changeover times, increase production rates, and reduce waste.

Versatility and Flexibility: CNC machine programming offers versatility in machining various materials, from metals to plastics and composites. The ability to program complex geometries and perform multiple operations in a single setup enhances flexibility and widens the range of possible applications.

Cost-Effectiveness: By automating machining processes, CNC machine programming reduces labor costs and improves overall productivity. It also minimizes material waste and rework, leading to cost savings and increased profitability.

Conclusion:

CNC machine programming plays a pivotal role in modern manufacturing, enabling the creation of intricate and precise parts with efficiency and accuracy. The combination of technical expertise, programming skills, and knowledge of machining principles empowers programmers to unlock the full potential of CNC machines. As technology advances, CNC machine programming continues to evolve, opening new possibilities and driving innovation in the manufacturing industry.[7]

Lesson 20. The Role of Cloud Storage in Data Management and Accessibility
   1. Find the new words and word combinations.
   2. Put different questions to the text.
   3. Read, translate and retell the text.
   4. Write the resume of the text in English.

In today's digital age, the volume of data generated by individuals and businesses is growing exponentially. With this data explosion comes the need for efficient data management and seamless accessibility. This is where cloud storage plays a pivotal role.

Cloud storage refers to the practice of storing data on remote servers that can be accessed over the internet. It offers numerous advantages over traditional local storage solutions. One of the key benefits is scalability. Cloud storage providers offer virtually unlimited storage capacity, allowing organizations to scale their data storage as per their needs without the hassle of physical infrastructure upgrades.

Another crucial aspect of cloud storage is data management. Cloud storage platforms often provide advanced tools and features to organize, categorize, and manage data effectively. Users can create folders, apply tags, and establish access controls to ensure data security and streamline collaboration.

Accessibility is another major advantage of cloud storage. With data stored in the cloud, users can access their files and documents from anywhere, at any time, using various devices such as computers, smartphones, or tablets. This level of flexibility and convenience empowers individuals and teams to work remotely, collaborate seamlessly, and stay productive.

Cloud storage also enhances data security. Cloud providers invest heavily in robust security measures, including encryption, firewalls, and intrusion detection systems, to protect data from unauthorized access and cyber threats. Additionally, regular backups and data redundancy practices ensure data durability and minimize the risk of data loss.

The use of cloud storage is prevalent across various industries. Businesses can leverage cloud storage for cost-effective data storage, simplified data backup and recovery, and streamlined data sharing among employees and stakeholders. Educational institutions can use cloud storage to store and share educational resources, enabling easy access for students and educators. Individuals can benefit from cloud storage to store personal files, photos, and videos, freeing up local storage space on their devices.

In conclusion, cloud storage plays a crucial role in modern data management and accessibility. It offers scalable storage solutions, efficient data organization and management tools, seamless accessibility from any device or location, enhanced data security, and cost-effective storage options. As the volume of data continues to grow, leveraging cloud storage becomes increasingly vital for individuals and organizations alike.[32]

Lesson 21. Creating Social Networks

1. Find the new words and word combinations.

2. Put different questions to the text.

3. Read, translate and retell the text.

4. Write the resume of the text in English.

In today's digital age, social networks have become an integral part of our daily lives. They connect people from different corners of the world, enable communication, and provide platforms for sharing ideas, content, and experiences.

The creation of social networks involves a combination of technological expertise, user-centered design, and effective networking strategies.

Understanding User Needs:

The first step in creating a successful social network is understanding the needs and preferences of the target audience. Conducting user research and gathering insights about user behaviors, interests, and motivations will help shape the features and functionality of the social network.

Planning and Design:

Once user needs are identified, the next step is planning the structure and design of the social network. This includes defining the core features such as user profiles, news feeds, messaging systems, privacy settings, and content sharing capabilities. Creating a visually appealing and intuitive user interface is crucial for attracting and retaining users.

Backend Development:

The backend development involves building the server-side infrastructure to handle user authentication, data storage, and communication between users. It also includes implementing algorithms for personalized content recommendations, friend suggestions, and real-time updates. Security measures, such as encryption and secure data transmission, are essential to protect user information.

Mobile Compatibility:

Given the widespread use of smartphones, it is essential to create social networks that are accessible and optimized for mobile devices. Developing native mobile applications or responsive web designs ensures a seamless user experience across different platforms and screen sizes.

Community Building and Engagement:

A successful social network relies on a thriving community. Implementing features that encourage user engagement, such as likes, comments, and sharing options, fosters interaction and content discovery. Moderation tools and content guidelines help maintain a safe and respectful environment for users.

Continuous Improvement:

Creating a social network is an ongoing process. Regular updates, bug fixes, and feature enhancements based on user feedback are crucial for keeping the platform relevant and competitive. Monitoring user metrics and analyzing data can provide insights for future improvements and growth strategies.

Creating a social network requires a multidisciplinary approach, combining technical expertise, user-centered design, and effective community building. By

understanding user needs, planning meticulously, and continuously improving the platform, developers can create engaging and successful social networks that connect people, foster communication, and shape the way we interact in the digital world.[28]

Lesson 22. The role of blockchain technologies in building decentralized financial systems

1. Find the new words and word combinations.

2. Put different questions to the text.

3. Read, translate and retell the text.

4. Write the resume of the text in English.

Blockchain technology has emerged as a disruptive force in the world of finance, revolutionizing the way transactions are conducted and financial systems are organized. With its decentralized nature and inherent security features, blockchain has the potential to reshape the traditional financial landscape and empower individuals with greater control over their own financial assets.

One of the key roles of blockchain technologies is in the creation of decentralized financial systems. Unlike traditional centralized financial systems that rely on intermediaries such as banks or financial institutions, decentralized financial systems operate on a peer-to-peer network powered by blockchain. This eliminates the need for intermediaries and allows for direct transactions between participants, reducing costs and increasing efficiency.

Blockchain enables the creation of digital currencies, commonly known as cryptocurrencies, which serve as the foundation for decentralized financial systems. Cryptocurrencies, such as Bitcoin and Ethereum, are built on blockchain technology and offer secure, transparent, and tamper-resistant transactions. They provide a decentralized alternative to traditional fiat currencies, allowing individuals to have full control over their funds without the need for intermediaries or central authorities.

Another important role of blockchain in decentralized finance is the facilitation of smart contracts. Smart contracts are self-executing contracts with the terms of the agreement directly written into code. These contracts are stored on the blockchain, ensuring transparency and immutability. Smart contracts enable automation and eliminate the need for intermediaries, reducing costs and potential risks associated with human error or fraud.

Decentralized finance, often referred to as DeFi, is an emerging sector within blockchain technology that aims to provide traditional financial services in a decentralized manner. DeFi applications include lending and borrowing platforms,

decentralized exchanges, and yield farming protocols, among others. These applications leverage blockchain's transparency, security, and programmability to offer financial services that are accessible to anyone with an internet connection, without the need for a traditional financial intermediary.

In conclusion, blockchain technologies play a crucial role in the development of decentralized financial systems. By leveraging blockchain's decentralized nature, security features, and smart contract capabilities, it becomes possible to build financial systems that are more inclusive, transparent, and efficient. The rise of blockchain has the potential to reshape the future of finance, empowering individuals with greater financial sovereignty and opening up new opportunities for innovation.[33]

Lesson 23. Military Computer Technologies in Ukraine
1. Find the new words and word combinations.
2. Put different questions to the text.
3. Read, translate and retell the text.
4. Write the resume of the text in English.

Military computer technologies play a crucial role in modern warfare, and Ukraine is no exception. The use of advanced computer systems and software has significantly enhanced the capabilities of the Ukrainian Armed Forces, allowing for more efficient communication, strategic planning, and decision-making on the battlefield.

One area where military computer technologies have made a significant impact is in surveillance and reconnaissance. Sophisticated surveillance systems equipped with high-resolution cameras, sensors, and radars provide real-time intelligence to military commanders, enabling them to gather crucial information about enemy positions, movements, and intentions. This information is crucial for making informed tactical decisions and ensuring the safety and success of military operations.

Furthermore, computer technologies have greatly improved command and control systems in the Ukrainian military. Integrated communication networks, satellite systems, and secure data transmission channels facilitate seamless communication and coordination between different units and branches of the military. This enhanced connectivity enables faster and more effective response times, better situational awareness, and improved overall operational efficiency.

Cybersecurity is another crucial aspect of military computer technologies. As the threat of cyber attacks continues to grow, protecting sensitive military

information and infrastructure is of paramount importance. Ukraine has invested in developing robust cybersecurity measures and technologies to safeguard its military systems from potential threats. This includes advanced firewalls, intrusion detection systems, encryption protocols, and continuous monitoring and response mechanisms.

In recent years, Ukraine has also been focusing on the development of unmanned aerial systems (UAS) or drones. These autonomous or remotely piloted aircraft have become invaluable tools in reconnaissance, surveillance, target acquisition, and even combat operations. Equipped with advanced sensors and cameras, drones provide real-time video footage and intelligence, minimizing the risks to human personnel and enhancing the effectiveness of military operations.

The advancement of military computer technologies in Ukraine reflects the country's commitment to modernizing its armed forces and strengthening its defense capabilities. By harnessing the power of computer systems, software, and network infrastructure, Ukraine is better equipped to respond to evolving security challenges and protect its national interests.[17]

Lesson 24. Smart Cities: Technologies and Innovations
1. Find the new words and word combinations.
2. Put different questions to the text.
3. Read, translate and retell the text.
4. Write the resume of the text in English.

In recent years, the concept of smart cities has gained significant traction worldwide. A smart city leverages cutting-edge technologies and innovative solutions to improve the quality of life for its citizens, enhance sustainability, and streamline urban operations.

Internet of Things (IoT):

At the heart of smart cities lies the Internet of Things (IoT), which enables seamless connectivity between devices, sensors, and infrastructure. IoT plays a pivotal role in collecting and analyzing real-time data, allowing cities to make informed decisions regarding traffic management, energy consumption, waste management, and public safety.

Smart cities generate massive amounts of data from various sources. Big data analytics empowers city authorities to derive valuable insights, identify patterns, and predict future trends. This information enables efficient resource allocation, optimized urban planning, and evidence-based policy-making.

Sustainable Energy Solutions:

Smart cities prioritize sustainability and embrace renewable energy sources. Technologies such as solar panels, wind turbines, and smart grids contribute to efficient energy generation, distribution, and consumption. Energy management systems ensure optimal utilization of resources while reducing carbon footprint.

Intelligent Transportation Systems (ITS):

Transportation is a critical aspect of urban life, and smart cities focus on improving mobility and reducing congestion. Intelligent Transportation Systems integrate advanced technologies like real-time traffic monitoring, smart parking systems, and electric vehicle infrastructure to enhance efficiency, reduce emissions, and enhance overall transportation experiences.

Modern cities require intelligent infrastructure to meet the needs of their citizens. Smart buildings equipped with energy-efficient systems, automated waste management systems, and advanced water management technologies contribute to resource conservation and sustainable living.

Smart cities emphasize citizen engagement and participation in decision-making processes. Digital platforms, mobile applications, and smart city portals enable residents to report issues, access public services, and engage with local authorities. This fosters a sense of community and enables cities to address the specific needs of their citizens.

Smart cities represent the future of urban living, utilizing advanced technologies and innovative approaches to create sustainable, efficient, and livable environments. The integration of IoT, big data analytics, sustainable energy solutions, intelligent transportation systems, smart infrastructure, and citizen engagement empowers cities to enhance the well-being of their residents and address complex urban challenges.[14]

Lesson 25. Text Data Analysis: From Search to Semantic Understanding
1. Find the new words and word combinations.
2. Put different questions to the text.
3. Read, translate and retell the text.
4. Write the resume of the text in English.

Text data analysis plays a vital role in extracting valuable insights from the vast amount of textual information available today.

Text Retrieval and Information Retrieval:

This section covers the basics of text retrieval and information retrieval techniques. It discusses search engines, indexing methods, and ranking algorithms

that enable efficient retrieval of relevant textual information from large collections. It also explores techniques for query expansion and relevance feedback to enhance search accuracy.

Text Preprocessing and Feature Extraction:

Text data often requires preprocessing to improve its quality and make it suitable for analysis. This section discusses techniques such as tokenization, stemming, stop-word removal, and normalization. It also explores feature extraction methods, including bag-of-words, term frequency-inverse document frequency (TF-IDF), and word embeddings.

Sentiment Analysis and Opinion Mining:

Sentiment analysis aims to understand the emotions, attitudes, and opinions expressed in text data. This section delves into techniques for sentiment analysis, including lexicon-based approaches, machine learning models, and deep learning methods. It also explores the application of sentiment analysis in social media monitoring, customer feedback analysis, and brand reputation management.

Text Classification and Topic Modeling:

Text classification involves categorizing text documents into predefined classes or topics. This section explores popular algorithms for text classification, such as Naive Bayes, Support Vector Machines (SVM), and deep learning models like Convolutional Neural Networks (CNN) and Recurrent Neural Networks (RNN). Additionally, it covers topic modeling techniques like Latent Dirichlet Allocation (LDA) for discovering latent themes in text data.

Natural Language Processing and Semantic Understanding:

This section dives into advanced techniques in text data analysis, focusing on natural language processing (NLP) and semantic understanding. It explores concepts like named entity recognition, part-of-speech tagging, syntactic parsing, and semantic role labeling. It also discusses semantic analysis methods, including semantic similarity, entity linking, and knowledge graph-based approaches.

Text data analysis has become a critical field in extracting valuable information and insights from textual sources. By applying various techniques and methodologies, such as text retrieval, sentiment analysis, text classification, and semantic understanding, IT professionals can uncover patterns, extract knowledge, and make data-driven decisions across domains like social media analysis, customer feedback, market research, and more.[18]

Lesson 26. Algorithmization in Programming

1. Find the new words and word combinations.

2. Put different questions to the text.

3. Read, translate and retell the text.

4. Write the resume of the text in English.

Algorithmization is a fundamental concept in programming that involves the process of designing and developing step-by-step instructions to solve a specific problem or task. It is the foundation upon which software development is built, enabling programmers to create efficient and reliable solutions.

At its core, algorithmization involves breaking down complex problems into smaller, more manageable sub-problems. This decomposition allows programmers to focus on solving individual components, making the overall problem more approachable. By identifying the inputs, desired outputs, and intermediate steps, programmers can devise logical sequences of operations that lead to the desired outcome.

The process of algorithmization requires careful analysis and planning. Programmers need to understand the problem domain, gather requirements, and identify any constraints or limitations. They must then devise a suitable algorithm that can be implemented using a programming language. This algorithm should be clear, unambiguous, and capable of producing correct results for all valid inputs.

Once the algorithm is defined, programmers can proceed to implement it using their chosen programming language. This involves translating the logical steps of the algorithm into code, which the computer can understand and execute. During implementation, programmers need to consider factors such as efficiency, readability, and maintainability to ensure that the code is robust and easy to work with.

Testing and debugging are crucial steps in algorithmization. Programmers need to verify that their algorithm produces the expected results and handles different scenarios correctly. They need to identify and fix any errors or bugs that may arise during the testing process, ensuring the reliability and correctness of the solution.

In conclusion, algorithmization is a vital aspect of programming that enables developers to solve complex problems systematically. It involves breaking down problems into smaller components, designing logical sequences of operations, and implementing them in code. Through careful planning, implementation, and testing, programmers can create efficient and reliable solutions that meet the requirements of the problem domain.[1]

Lesson 27. HTTP and HTTPS: Securing Web Communication

1. Find the new words and word combinations.

2. Put different questions to the text.

3. Read, translate and retell the text.

4. Write the resume of the text in English.

HTTP (Hypertext Transfer Protocol) and HTTPS (Hypertext Transfer Protocol Secure) are two fundamental protocols used for communication between web browsers and web servers. They define how data is transmitted and displayed on the World Wide Web. However, there is a significant difference between the two in terms of security.

HTTP is the standard protocol used for transmitting data over the internet. When you enter a website's URL in your browser, it sends an HTTP request to the server, which then responds with the requested data. This data is transmitted in plain text, making it vulnerable to interception and manipulation by malicious entities.

To address this security concern, HTTPS was developed. HTTPS uses an additional layer of security called SSL/TLS (Secure Sockets Layer/Transport Layer Security) to encrypt the data transmitted between the browser and the server. This encryption ensures that the data remains confidential and integral, making it extremely difficult for attackers to eavesdrop or tamper with the communication.

The key difference between HTTP and HTTPS lies in the use of encryption. In an HTTPS connection, the data is encrypted using SSL/TLS certificates, which are issued by trusted third-party entities known as Certificate Authorities (CAs). These certificates verify the authenticity of the server and establish a secure connection.

HTTPS provides several benefits over HTTP. Firstly, it ensures the privacy and integrity of user data, which is crucial when transmitting sensitive information like passwords, credit card details, or personal data. Secondly, HTTPS enhances trust and credibility for websites by displaying a padlock icon or a green address bar, indicating that the connection is secure. This helps users identify legitimate websites and protects them from phishing attacks or fraudulent activities.

Moreover, HTTPS is now considered a ranking factor by search engines like Google. Websites using HTTPS are given preference in search engine results, boosting their visibility and organic traffic. It also helps protect the reputation of websites, as users are more likely to trust a secure connection.

In Ukraine, the adoption of HTTPS has gained momentum in recent years. With increasing awareness of cybersecurity risks and the need for data protection, many organizations and website owners have transitioned from HTTP to HTTPS.

Government websites, e-commerce platforms, online banking, and social media platforms are among those prioritizing HTTPS to ensure secure communication with their users.

The transition to HTTPS involves obtaining an SSL/TLS certificate, configuring web servers, and updating website URLs. While it may require some technical knowledge, there are tools and resources available to simplify the process. Additionally, web hosting providers and certificate authorities offer various options to acquire and manage SSL/TLS certificates.

In conclusion, HTTP and HTTPS are protocols that facilitate communication between web browsers and servers. While HTTP transmits data in plain text, HTTPS encrypts data using SSL/TLS certificates, providing a secure and trustworthy connection. The adoption of HTTPS is essential to safeguard sensitive information, enhance user trust, and improve website visibility. As cybersecurity becomes increasingly important, transitioning from HTTP to HTTPS is a crucial step for websites in Ukraine and globally.[15]

Lesson 28. PHP as a backend language
1. Find the new words and word combinations.
2. Put different questions to the text.
3. Read, translate and retell the text.
4. Write the resume of the text in English.

PHP (Hypertext Preprocessor) is a widely used scripting language that is specifically designed for web development. It is a server-side language, meaning that it runs on the web server before the content is delivered to the client's browser. PHP is known for its versatility and is one of the most popular languages for building dynamic websites and web applications.

One of the key features of PHP is its simplicity and ease of use. The syntax is similar to other languages like C and JavaScript, making it relatively easy for developers to learn and start coding. Additionally, PHP has a large and active community, which means there are ample resources, tutorials, and libraries available to help developers solve problems and enhance their projects.

PHP offers a wide range of functionality for web development. It supports various databases, including MySQL, PostgreSQL, and Oracle, allowing developers to interact with databases and retrieve or store data. PHP also provides extensive support for handling forms, processing user input, and performing various server-side

operations. It enables the creation of dynamic web pages that can generate content based on user interactions or data retrieved from databases.

One of the major advantages of PHP is its compatibility with different operating systems and web servers. It can run on Windows, Linux, macOS, and other platforms, and it can be used with popular web servers like Apache and Nginx. This flexibility makes PHP a versatile choice for developers, allowing them to work with their preferred tools and environments.

Furthermore, PHP integrates well with HTML and CSS, making it seamless to embed PHP code within web pages. This enables developers to create dynamic content, generate HTML on the fly, and create reusable templates for consistent page layouts. With PHP, developers have the ability to create interactive and engaging websites that can deliver personalized experiences to users.

In summary, PHP is a powerful scripting language for web development. Its simplicity, extensive functionality, compatibility, and integration capabilities make it a popular choice among developers. With PHP, developers can create dynamic, database-driven websites and web applications that meet the demands of modern web development.[27]

Lesson 29. Data Analytics: Methods and Tools
1. Find the new words and word combinations.
2. Put different questions to the text.
3. Read, translate and retell the text.
4. Write the resume of the text in English.

Data analytics is a field that focuses on extracting valuable insights and knowledge from large sets of data. It involves various techniques and tools to process, analyze, and interpret data to support decision-making processes. In the context of information technology, data analytics plays a crucial role in uncovering patterns, trends, and correlations that can drive business growth and innovation.

Descriptive Analytics: Descriptive analytics involves analyzing historical data to understand what has happened in the past. It provides a summary of key metrics, trends, and patterns in the data, allowing organizations to gain a better understanding of their operations and performance.

Predictive Analytics: Predictive analytics leverages statistical models and algorithms to forecast future outcomes based on historical data. By identifying patterns and relationships in the data, predictive analytics helps organizations make informed predictions and take proactive actions.

Prescriptive Analytics: Prescriptive analytics goes beyond predicting future outcomes and suggests optimal courses of action to achieve desired outcomes. It uses advanced algorithms and optimization techniques to recommend the best decisions based on various constraints and objectives.

Data Visualization: Data visualization tools and techniques help represent complex data sets in the form of charts, graphs, and interactive dashboards. Visualizing data enables users to explore information visually, uncover patterns, and effectively communicate findings and insights.

Machine Learning: Machine learning algorithms enable systems to automatically learn from data and improve their performance without explicit programming. They can detect patterns, classify data, and make predictions. Machine learning tools such as scikit-learn, TensorFlow, and R provide a wide range of algorithms and frameworks for data analysis and modeling.

Big Data Analytics: With the advent of large data volumes, specialized tools and technologies have emerged for processing, storing, and analyzing big data. Big data analytics platforms such as Apache Hadoop, Spark, and NoSQL databases enable organizations to efficiently handle, store, and analyze large volumes of data.

Data analytics has become critically important for organizations seeking a competitive edge and data-driven decision-making. By employing descriptive, predictive, and prescriptive analytics methods, utilizing data visualization tools, and leveraging machine learning algorithms, businesses can extract valuable insights from data and drive innovation in a world where data-based decision-making is paramount.[12]

Lesson 30. AI technologies

1. Find the new words and word combinations.

2. Put different questions to the text.

3. Read, translate and retell the text.

4. Write the resume of the text in English.

Artificial Intelligence (AI) is a rapidly evolving field within computer science that focuses on the development of intelligent machines that can perform tasks that typically require human intelligence. These tasks include but are not limited to learning, reasoning, problem-solving, perception, language understanding, and decision-making.

AI encompasses a wide range of techniques, methodologies, and approaches, including machine learning, neural networks, deep learning, natural language

processing (NLP), computer vision, robotics, and more. These techniques enable AI systems to analyze large amounts of data, recognize patterns, make predictions, and continuously improve their performance over time.

One of the key components of AI is machine learning, which involves training algorithms to learn from data and make predictions or decisions without being explicitly programmed for each task. Supervised learning, unsupervised learning, and reinforcement learning are common approaches used in machine learning.

Natural language processing (NLP) is another critical area of AI that focuses on enabling computers to understand, interpret, and generate human language. NLP techniques are used in applications such as virtual assistants, chatbots, language translation, sentiment analysis, and text summarization.

Computer vision is another important subfield of AI that enables computers to interpret and understand visual information from the real world. Computer vision techniques are used in applications such as image recognition, object detection, facial recognition, and autonomous vehicles.

AI technologies have a wide range of applications across various industries, including healthcare, finance, transportation, manufacturing, entertainment, and more. They are used to improve efficiency, automate tasks, make better decisions, enhance user experiences, and drive innovation.

While AI has the potential to bring significant benefits to society, including improving healthcare outcomes, increasing productivity, and addressing societal challenges, it also raises ethical, social, and economic concerns. These include issues related to data privacy, algorithmic bias, job displacement, and the potential misuse of AI technologies.

Overall, AI represents a transformative force that has the potential to reshape industries, economies, and societies in profound ways. It is essential for researchers, policymakers, and stakeholders to work together to ensure that AI is developed and deployed in a responsible and ethical manner that benefits humanity as a whole.[23]

Lesson 31. Development of E-commerce Systems: Trends and Optimization
1. Find the new words and word combinations.
2. Put different questions to the text.
3. Read, translate and retell the text.
4. Write the resume of the text in English.

The development of e-commerce systems is an important task for many businesses today. In a world where customers increasingly choose online shopping, it

is important to have an efficient and user-friendly e-commerce platform. Here, we will discuss some trends in the development of e-commerce systems and strategies for their optimization.

One of the trends is mobile commerce. More and more people are using mobile devices to make purchases, so having a mobile-responsive version of your platform is crucial. Another trend is social commerce, where businesses use social media to attract customers and increase sales. Optimizing for a multi-channel experience is also becoming increasingly important as customers interact with a brand through various channels such as websites, mobile apps, and physical stores.

The architecture and infrastructure of an e-commerce system play a crucial role in its efficiency and scalability. Traditional monolithic architectures are gradually being replaced by microservices or headless architectures that allow for greater flexibility and scalability. Additionally, leveraging cloud technologies, containerization, and serverless computing enables rapid expansion and scalability of the system.

Optimizing the user experience is key in the development of e-commerce systems. Providing a convenient and intuitive user interface, quick product search capabilities, personalized recommendations, and secure transaction processes are essential elements of user experience optimization.

Security is another important aspect of e-commerce system development. Protecting customer personal data, preventing fraud, and ensuring secure payments are crucial considerations. Compliance with data protection regulations and transparent privacy policies contribute to building trust in the platform.

Performance optimization also plays a vital role in the development of e-commerce systems. Utilizing caching, content delivery networks (CDNs), optimizing databases, and implementing efficient coding practices can significantly improve page load times and overall system performance, even under high traffic conditions.

Overall, the development of e-commerce systems requires attention to trends and the implementation of optimization strategies. By providing a convenient user experience, ensuring security, and optimizing performance, businesses can attract more customers and leverage the opportunities offered by the digital marketplace.[13]

Lesson 32. Computer Technologies in the Future: Trends and Optimization

1. Find the new words and word combinations.

2. Put different questions to the text.

3. Read, translate and retell the text.

4. Write the resume of the text in English.

In the modern world, computer technologies are rapidly evolving and shaping our environment. However, when we think about the future, we can anticipate that computer technologies will play an even greater role in our lives. They are penetrating various domains, from medicine and education to manufacturing and entertainment.

One key trend in the future is the expansion of the Internet of Things (IoT). Through IoT, various devices will be able to communicate with each other, collecting and exchanging data. This opens up countless opportunities for automation and optimization in homes, cities, and industries.

Another significant trend is the development of Artificial Intelligence (AI). AI is already being applied in many areas, from automating routine tasks to image recognition and voice control. In the future, AI will continue to advance, becoming smarter and capable of analyzing large volumes of data for decision-making.

Augmented Reality (AR) and Virtual Reality (VR) are also important topics. AR allows for the merging of virtual objects with the real world, while VR creates fully immersive environments. These technologies have the potential to transform how we perceive information, learn, and interact with the world.

In the field of cybersecurity, significant progress is expected as well. The increasing number of connected devices creates new threats to data security. Therefore, developing new technologies and methods to protect information from cyber attacks will become increasingly important.

We must also consider the environmental aspect of computer technologies. In the future, progressive companies will actively work on creating more energy-efficient devices and reducing their impact on the environment.

The future of computer technologies promises numerous new possibilities and innovations. From the expansion of IoT and the development of AI to the utilization of AR and VR, we stand on the threshold of a new era. However, along with all the advantages, new challenges arise, such as cybersecurity and environmental issues. Therefore, it is crucial to continuously improve technologies and seek solutions that ensure security, resilience, and sustainability.[8]

Lesson 33. Virtual Reality

1. Find the new words and word combinations.

2. Put different questions to the text.

3. Read, translate and retell the text.

4. Write the resume of the text in English.

Virtual Reality (VR) is a technology that creates an immersive environment, simulating the real world or creating an imaginary one. In VR, users can feel as if they are in a different place or time, thanks to special virtual objects and scenes presented to them through various devices such as virtual headsets, goggles, or gloves.

VR technology is rapidly evolving and finding applications in various aspects of life. In video games, for example, VR allows players to immerse themselves in virtual worlds and interact with them like never before. In education, VR can be used to create interactive lessons and simulations that help students better understand complex concepts. In medicine, VR is used for training surgical procedures and treating phobias and PTSD.

One of the most exciting prospects of VR is its potential in entertainment and the arts. From virtual museums and exhibitions to immersive concerts and theatrical performances, VR can change the way we perceive and interact with art and culture.

Alongside the great potential of VR, there are also challenges and questions, such as issues related to security and data privacy, potential health risks, as well as social and ethical concerns.

In conclusion, VR opens up new horizons in various fields and contributes to our greater understanding of the world around us. It encourages further research, innovation, and development that can benefit humanity as a whole.[19]

Lesson 34. Computer Viruses: Understanding the Threats

1. Find the new words and word combinations.

2. Put different questions to the text.

3. Read, translate and retell the text.

4. Write the resume of the text in English.

Computer viruses are malicious programs designed to replicate and spread, often with the intention of causing harm to computers, networks, and data. These digital pathogens can infiltrate systems through various means, such as infected email attachments, compromised websites, or software vulnerabilities. Once inside a host

system, viruses can execute unwanted actions, corrupt files, steal sensitive information, or even render a computer inoperable.

Types of Computer Viruses:

File Infectors:

These viruses attach themselves to executable files, spreading when the infected file is executed. They can modify or overwrite the content of the host file, making it difficult to detect and eliminate the virus.

Boot Sector Viruses:

Boot sector viruses target the boot sector of storage devices like hard drives and USB drives. They replace the legitimate boot code with their malicious code, allowing them to activate whenever the infected device is booted.

Macro Viruses:

Macro viruses infect documents, spreadsheets, and other files that contain macros. They exploit the macros' programming capabilities to spread the virus when the infected file is opened or edited.

Polymorphic Viruses:

Polymorphic viruses constantly change their appearance to evade detection by antivirus software. They alter their code structure while maintaining the same functionality, making it challenging to detect and eliminate them.

Ransomware:

Ransomware is a type of virus that encrypts files on a victim's computer, rendering them inaccessible. The attackers then demand a ransom payment in exchange for the decryption key, holding the victim's data hostage.

Protecting Against Computer Viruses:

Install Antivirus Software:

Use reputable antivirus software to scan and detect viruses, malware, and other threats. Keep the software updated to ensure it can identify the latest virus signatures.

Regularly Update Software:

Keep your operating system, web browsers, and other software up to date with the latest security patches. These updates often address vulnerabilities that viruses can exploit.

Exercise Caution Online:

Be mindful of the websites you visit, the files you download, and the emails you open. Avoid clicking on suspicious links or opening attachments from unknown sources.

Enable Firewall Protection:

Enable and configure a firewall to monitor and control incoming and outgoing network traffic. A firewall acts as a barrier between your computer and potential threats.

Backup Your Data:

Regularly back up your important files to an external storage device or a cloud-based service. In the event of a virus infection or ransomware attack, having backups can help you recover your data without paying a ransom.

Stay Informed and Vigilant:

Computer viruses pose a constant threat in our interconnected world. It is essential to stay informed about the latest security practices, educate yourself on safe online behavior, and remain vigilant in protecting your digital assets. Explore our page for more information, tips, and insights on computer viruses, and empower yourself with the knowledge to safeguard your computer systems from these insidious threats.[9]

Lesson 35. Understanding How Sensors Work
1. Find the new words and word combinations.
2. Put different questions to the text.
3. Read, translate and retell the text.
4. Write the resume of the text in English.

Sensors play a vital role in our modern lives, enabling the detection, measurement, and monitoring of various physical quantities. Here, we delve into the principles behind sensor technology and how they contribute to the advancement of countless industries.

A sensor is a device or module that detects and responds to a physical stimulus or environmental change. It converts these inputs into measurable electrical or optical signals that can be processed and analyzed by electronic systems. Sensors are capable of capturing a wide range of information, including temperature, pressure, light, motion, proximity, and much more.

Principles of Sensor Operation:

Sensing Element:

At the core of every sensor lies a sensing element, which interacts with the physical stimulus and generates a corresponding electrical or optical signal. The sensing element may utilize various phenomena such as resistance, capacitance, inductance, or light absorption to convert the physical input into a measurable output.

Transduction:

The process of converting the physical stimulus into an electrical or optical signal is known as transduction. Different types of sensors employ different transduction mechanisms. For example, a temperature sensor may use a thermistor, which exhibits changes in resistance with temperature, while a light sensor may utilize a photodiode that converts light intensity into a current or voltage signal.

Signal Conditioning:

Once the sensor generates the raw signal, it often requires conditioning to enhance its accuracy, resolution, or compatibility with the subsequent electronic systems. Signal conditioning may involve amplification, filtering, linearization, or calibration processes to ensure the output accurately represents the measured quantity.

Output and Interface:

The processed signal from the sensor is then provided as an output, typically in a format suitable for the intended application. This can be an analog voltage, current, or frequency, or a digital representation such as binary or serial data. Sensors often interface with microcontrollers, embedded systems, or other electronic devices to transmit the output for further processing, analysis, or control.

Applications of Sensors:

Sensors find application in a vast array of industries and domains. Here are some common examples:

Automotive:

Sensors are extensively used in automotive systems for measuring parameters like temperature, pressure, speed, and proximity. They contribute to safety features, engine performance, fuel efficiency, and driver assistance systems.

Healthcare:

In healthcare, sensors are employed for monitoring vital signs, such as heart rate, blood pressure, and oxygen levels. They play a crucial role in medical imaging, diagnostic devices, and prosthetics.

Environmental Monitoring:

Sensors help in monitoring and managing environmental factors, including air quality, humidity, radiation levels, and water quality. They aid in pollution control, weather forecasting, and resource management.

Industrial Automation:

Sensors enable precise control and monitoring of various industrial processes. They are used for measuring parameters like temperature, pressure, level, and flow, ensuring efficient operation and quality control.

Consumer Electronics:

Sensors are integral to numerous consumer electronic devices, including smartphones, wearables, and smart home systems. They enable features such as touchscreens, gesture recognition, motion tracking, and ambient light adjustment.

The Future of Sensor Technology:

As technology advances, sensors continue to evolve, becoming smaller, more accurate, and capable of measuring increasingly complex parameters. Emerging fields like Internet of Things (IoT), robotics, and artificial intelligence heavily rely on sensor data for intelligent decision-making and automation [35].

Lesson 36. The World of Displays: Unveiling Visual Technology
1. Find the new words and word combinations.
2. Put different questions to the text.
3. Read, translate and retell the text.
4. Write the resume of the text in English.

A display, also known as a screen or monitor, is an electronic device that presents visual content to the viewer. It is the interface between humans and electronic systems, enabling us to interact with information, entertainment, and digital media. Displays come in various forms, including liquid crystal displays (LCDs), organic light-emitting diodes (OLEDs), e-paper displays, and more.

Display Technologies:

Liquid Crystal Displays (LCD):

LCDs are widely used in a range of devices, from smartphones and televisions to computer monitors and automotive displays. They work by utilizing liquid crystals that change their orientation in response to an electric field, controlling the passage of light and creating images.

Organic Light-Emitting Diodes (OLED):

OLED displays offer vibrant colors, deep blacks, and high contrast ratios. They consist of organic compounds that emit light when an electric current passes through them. Unlike LCDs, OLEDs do not require a separate backlight, resulting in thinner and more flexible display panels.

E-Paper Displays:

E-paper displays, also known as electronic ink displays, are designed to mimic the appearance of ink on paper. They are commonly used in e-readers, digital signage, and electronic shelf labels. E-paper displays consume minimal power,

provide excellent visibility in different lighting conditions, and maintain a static image even when power is disconnected.

MicroLED Displays:

MicroLED displays are considered the future of visual technology. They consist of an array of microscopic LEDs that emit their own light. MicroLEDs offer high brightness, wide color gamut, and superior energy efficiency. They have the potential to deliver incredibly sharp images and are being explored for applications in large-scale displays, virtual reality (VR), and augmented reality (AR) devices.

Applications of Displays:

Consumer Electronics:

Displays are integral to our everyday consumer electronics, such as smartphones, tablets, laptops, and televisions. They provide us with immersive visual experiences for gaming, streaming content, communication, and productivity.

Automotive Displays:

Displays play a crucial role in modern automotive systems, including instrument clusters, infotainment screens, heads-up displays (HUDs), and rear-seat entertainment. They enhance the driving experience and provide critical information to the driver and passengers.

Medical Displays:

High-resolution displays are essential in medical imaging applications, such as X-rays, MRI scans, and ultrasounds. They enable accurate diagnoses, surgical planning, and medical education.

Industrial and Commercial Displays:

Displays find application in industrial control systems, public information displays, digital signage, and interactive kiosks. They facilitate communication, information sharing, and user interaction in various environments.

Virtual Reality and Augmented Reality:

Displays are integral to immersive technologies like VR and AR, enabling users to visualize virtual objects and interact with virtual environments. High-resolution and low-latency displays are critical for creating convincing and engaging experiences [34].

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English for Computer Science Students

Методичні рекомендації для самостійної роботи з дисципліни «Іноземна мова» для студентів першого (бакалаврського) рівня вищої освіти галузі знань 12 «Інформаційні технології» спеціальності 122 «Комп'ютерні науки»

Набір і наукове редагування авторські