MODELO1

Programming language

A programming language is any set of rules that converts strings, or graphical program elements in the case of visual programming languages, to various kinds of machine code output. Programming languages are one kind of computer language, and are used in computer programming to implement algorithms. Most programming languages consist of instructions for computers. There are programmable machines that use a set of specific instructions, rather than general programming languages. Thousands of different programming languages have been created, and more are being created every year. Many programming languages are written in an imperative form (i.e., as a sequence of operations to perform) while other languages use the declarative form (i.e. the desired result is specified, not how to achieve it). The description of a programming language is usually split into the two components of syntax (form) and semantics (meaning), which are usually defined by a formal language. Some languages are defined by a specification document (for example, the C programming language is specified by an ISO Standard) while other languages (such as Perl) have a dominant implementation that is treated as a reference. Some languages have both, with the basic language defined by a standard and extensions taken from the dominant implementation being common. Programming language theory is a subfield of computer science that deals with the design, implementation, analysis, characterization, and classification of programming languages.

Según lo interpretado en el párrafo conteste las siguientes preguntas en CASTELLANO:
1. What is a programming language?
2. What do most of the programming languages consist of?
3. How are they written?
4. How is the description of a programming language divided? 5. What is programming language theory and what does it deal with?

MODELO 2

Computer program

In imperative programming, a computer program is a sequence of instructions in a programming language that a computer can execute or interpret. In declarative programming, a computer program is a set of instructions.

A computer program in its human-readable form is called source code. Source code needs another computer program to execute because computers can only execute their native machine instructions. Therefore, source code may be translated to machine instructions using the language's compiler. The resulting file is called an executable. Alternatively, source code may execute within the language's interpreter.

Programming languages

Computer programming (also known as software development and software engineering) is the process of writing or editing source code. In a formal environment, a systems

analyst will gather information from managers about all the organization's processes to automate. This professional then prepares a detailed plan for the new or modified system. The plan is analogous to an architect's blueprint. A computer programmer is a specialist responsible for writing or modifying the source code to implement the detailed plan.

Según lo interpretado en el párrafo conteste las siguientes preguntas en CASTELLANO:

1. What is a computer program according to imperative programming and declarative programming?
2. what does the source code need?
3. What is computer programming?
4. What does a systems analyst do?
5. What does a computer programmer do?

MODELO 3

Programmable logic controller

A **programmable logic controller** (**PLC**) or **programmable controller** is an industrial computer that has been ruggedized and adapted for the control of manufacturing processes, such as assembly lines, machines, robotic devices, or any activity that requires high reliability, ease of programming, and process fault diagnosis. Dick Morley is considered as the father of PLC as he had invented the first PLC, the Modicon 084, for General Motors in 1968.

PLCs can range from small modular devices with tens of inputs and outputs (I/O), in a housing integral with the processor, to large rack-mounted modular devices with thousands of I/O, and which are often networked to other PLC and SCADA systems.

They can be designed for many arrangements of digital and analog I/O, extended temperature ranges, immunity to electrical noise, and resistance to vibration and impact. Programs to control machine operation are typically stored in battery-backed-up or non-volatile memory.

PLCs were first developed in the automobile manufacturing industry to provide flexible, rugged and easily programmable controllers to replace hard-wired relay logic systems. Since then, they have been widely adopted as high-reliability automation controllers suitable for harsh environments.

A PLC is an example of a hard real-time system since output results must be produced in response to input conditions within a limited time, otherwise unintended operation will result.

Según lo interpretado en el párrafo conteste las siguientes preguntas en CASTELLANO:

1. What does the acronym PLC mean and what is it?
2. Who is considered the father of PLCs and why?
3. How can PLCs vary?
4. Where were PLCs first developed and for what?

MODELO 4

Teleprocessing monitor

A teleprocessing monitor (also, Transaction Processing Monitor or TP Monitor) is a control program that monitors the transfer of data between multiple local and remote terminals to ensure that the transaction processes completely or, if an error occurs, to take appropriate actions.

The term is frequently used in mainframe-based wide area networks, where TP monitors manage the transfer of data between several clients making requests to a server. TP monitors will control and manage the data smoothly to available servers by detecting hardware failures and switching to another node.

Teleprocessing monitors were originally developed to allow several clients to connect to one server. However, they developed to what are now known as transaction processing monitors (TPMs). A TPM breaks down applications or code into transactions and ensures that all databases are updated in a single transaction. This is useful for airline reservations, car rentals, hotel accommodations, ATM transactions or other high volume transaction locations. TP monitors ensure that transactions are not lost or destroyed. Sometimes they are referred to as middleware, because the client sends the data for query or processing to the server database and then it is sent back to the user terminal. This can be accomplished remotely and by multiple users simultaneously. TP monitors are easily scalable allowing for increase in users and data processed.

Examples include the CICS (Customer Information Control System) for IBM mainframes introduced in July 1969, which can process thousands of transactions per second; IBM Information Management System (IMS, more specifically its IMS TM, also known as IMS DC, component); ACMS (Application Control Management System)

Según lo interpretado en el párrafo conteste las siguientes preguntas en CASTELLANO:

1. What is a teleprocessing monitor and what is it used for?
2. What does the acronym TPM mean? What does it do?
3. What is TPM useful for?
4. Why is it called middleware? How is this data transfer achieved?

MODELO 5

What is Data Storage?

Data storage essentially means that files and documents are recorded digitally and saved in a storage system for future use. Storage systems may rely on electromagnetic, optical or other media to preserve and restore the data if needed. Data storage makes it easy to back up files for safekeeping and quick recovery in the event of an unexpected computing crash or cyberattack.

Data storage can occur on physical hard drives, disk drives, USB drives or virtually in the cloud. The important thing is that your files are backed up and easily available should your systems ever crash beyond repair. Some of the most important factors to consider in terms of data storage are reliability, how robust the security features tend to be and the cost to implement and maintain the infrastructure. Browsing through different data storage solutions and applications can help you arrive at the choice that is the best fit for your business' needs.

Direct Attached Storage (DAS)

As the name might suggest, direct attached storage (DAS) includes types of data storage that are physically connected to your computer. This storage is generally accessible to only a single machine. DAS solutions are great for creating local backups and can be more affordable than NAS solutions, but sharing data between machines can be cumbersome.

Network Attached Storage (NAS)

Network attached storage (NAS) allows for multiple machines to share storage over a network. This is accomplished with multiple hard drives or other storage devices in a RAID configuration. One of the key benefits of NAS is the ability to centralize data and improve collaboration. Data can be easily shared among connected machines, and permission levels can be set to control access.

Según lo interpretado en el párrafo conteste las siguientes preguntas en CASTELLANO:

1. What is data storage? What do they depend on?
2. What are the most important factors to consider in terms of data storage?
3. What types of data storage does DAS include?
4. What does NAS enable, how is it achieved and what is one of the key benefits?

MODELO 6

Malware

Malicious software (malware) is any software code or computer program "intentionally written to harm a computer system or its users." Once present on a computer, it can leak sensitive details such as personal information, business information and passwords, can give control of the system to the attacker, and can corrupt or delete data permanently.

Types of malware include some of the following:

- **Viruses** are a specific type of malware, and are normally a malicious code that hijacks software with the intension to "do damage and spread copies of itself." Copies are made with the aim to spread to other programs on a computer.
- **Worms** are similar to viruses, however viruses can only function when a user runs (opens) a comprised program. Worms therefore are self-replicating malware that spread between programs, apps and devices without the need for human interaction.
- **Trojan horses** are programs that pretend to be helpful or hide themselves within desired or legitimate software to "trick users into installing them." Once installed, a RAT (remote access trojan) can create a secret backdoor on the affected device.
- **Spyware** is a type of malware that secretly gathers information on an infected computers and transmits the sensitive information back to the attacker.
- **Scareware,** as the name suggests, is a form of malware which uses social engineering (manipulation) to scare, shock, trigger anxiety, or suggest the perception of a threat in order to manipulate users into buying or installing unwanted software.

Phishing

Phishing is the attempt of acquiring sensitive information such as usernames, passwords, and credit card details directly from users by deceiving the users. Phishing is typically carried out by email spoofing, instant messaging, text message, or on a phone call, and it often directs users to enter details at a fake website whose look and feel are almost identical to the legitimate one. The fake website often asks for personal information, such as login details and passwords. This information can then be used to gain access to the individual's real account on the real website.

Según lo interpretado en el párrafo conteste las siguientes preguntas en CASTELLANO:

1. What is malware?

2. What are viruses?

3. What are Trojan horses?

4. What is phishing?

MODELO 7

Generative artificial intelligence

Generative artificial intelligence (also generative AI or GenAI) is artificial intelligence capable of generating text, images, or other media, using generative models. Generative AI models learn the patterns and structure of their input training data and then generate new data that has similar characteristics.

In the early 2020s, advances in transformer-based deep neural networks enabled a number of generative AI systems notable for accepting natural language prompts as input. These include large language model chatbots such as ChatGPT, Bing Chat, Bard, and LLaMA, and text-to-image artificial intelligence art systems such as Stable Diffusion, Midjourney, and DALL-E

Generative AI has uses across a wide range of industries, including art, writing, software development, product design, healthcare, finance, gaming, marketing, and fashion. Investment in generative AI surged during the early 2020s, with large companies such as Microsoft, Google, and Baidu as well as numerous smaller firms developing generative AI models. However, there are also concerns about the potential misuse of generative AI, including cybercrime or creating fake news which can be used to deceive or manipulate people.

Artificial intelligence art

Artificial intelligence art is any visual artwork created through the use of artificial intelligence (AI) programs.

Artists began to create AI art in the mid to late-20th century, when the discipline was founded. In the early 21st century, the availability of AI art tools to the general public increased, providing opportunities for use outside of academia and professional artists. Throughout its history, artificial intelligence art has raised many philosophical concerns, including those related to copyright, deception, and its impact on traditional artists, including their incomes.

Según lo interpretado en el párrafo conteste las siguientes preguntas en CASTELLANO:

1. What is generative artificial intelligence?

2. What do GenAI models learn?

3. What uses does generative AI have?

4. What are the concerns about misuse of GenAI?

5. What is the art of artificial intelligence?

MODELO 8

Database Normalization

In the field of relational database design, *normalization* is a systematic way of ensuring that a database structure is suitable for general-purpose querying and free of certain undesirable characteristics—insertion, update, and deletion anomalies that could lead to loss of data integrity.

The Normal Forms

The database community has developed a series of guidelines for ensuring that databases are normalized. These are referred to as normal forms and are numbered from one (1NF) through five (5NF).

First Normal Form (1NF)

First normal form sets the fundamental rules for an organized database:

Eliminate duplicative columns from the same table.

Create separate tables for each group of related data and identify each row with a unique column or set of columns (the primary key).

Second Normal Form (2NF)

Meet all the requirements of the first normal form.

Remove subsets of data that apply to multiple rows of a table and place them in separate tables.

Create relationships between these new tables and their predecessors through the use of foreign keys.

Third Normal Form (3NF)

Third normal form (3NF) goes one significant step further:

Meet all the requirements of the second normal form.

Remove columns that are not dependent upon the primary key.

Según lo interpretado en el párrafo conteste las siguientes preguntas en CASTELLANO:

1. What is database normalization?

2. What are the characteristics of the First Normal Form?

3. What are the properties of the 2NF?

4. Describe the 3NF.

MODELO 9

Data storage devices.

To store data, regardless of form, users need storage devices. Data storage devices come in two main categories: direct area storage and network-based storage.

Direct area storage, also known as direct-attached storage (DAS), is as the name implies. This storage is often in the immediate area and directly connected to the computing machine accessing it. Often, it's the only machine connected to it. DAS can provide decent local backup services, too, but sharing is limited. DAS devices include floppy disks, optical discs—compact discs (CDs) and digital video discs (DVDs)—hard disk drives (HDD), flash drives and solid-state drives (SSD).

Network-based storage allows more than one computer to access it through a network, making it better for data sharing and collaboration. Its off-site storage capability also makes it better suited for backups and data protection. Two common network-based storage setups are network-attached storage (NAS) and storage area network (SAN).

NAS is often a single device made up of redundant storage containers or a redundant array of independent disks (RAID). SAN storage can be a network of multiple devices of various types, including SSD and flash storage, hybrid storage, hybrid cloud storage, backup software and appliances, and cloud storage. Here are how NAS and SAN differ:

NAS: Single storage device or RAI, File storage system, TCP/IP Ethernet network, Limited users, Limited speed, Limited expansion options and Lower cost and easy setup

SAN: Network of multiple devices, Block storage system, , Optimized for multiple users, Faster performance, Higher cost and complex setup.

Según lo interpretado en el párrafo conteste las siguientes preguntas en CASTELLANO:

1. What is direct area storage? What does it do? Explain.
2. What is Network-Based Storage? What does it do? Explain.
3. Describe the features of NAS.
4. Describe the features of SAN.

MODELO 10

Data communication

Data communication or digital communications, including data transmission and data reception, is the transfer and reception of data in the form of a digital bitstream or a digitized analog signal transmitted over a point-to-point or point-to-multipoint communication channel. Examples of such channels are copper wires, optical fibers, wireless communication using radio spectrum, storage media and computer buses. The data are represented as an electromagnetic signal, such as an electrical voltage, radiowave, microwave, or infrared signal.

Analog transmission is a method of conveying voice, data, image, signal or video information using a continuous signal which varies in amplitude, phase, or some other property in proportion to that of a variable. The messages are either represented by a sequence of pulses by means of a line code (baseband transmission), or by a limited set of continuously varying waveforms (passband transmission), using a digital modulation method. The passband modulation and corresponding demodulation is carried out by modem equipment. According to the most common definition of digital signal, both baseband and passband signals representing bit-streams are considered as digital transmission, while an alternative definition only considers the baseband signal as digital, and passband transmission of digital data as a form of digital-to-analog conversion.

Data transmitted may be digital messages originating from a data source, for example, a computer or a keyboard. It may also be an analog signal such as a phone call or a video signal, digitized into a bit-stream, for example, using pulse-code modulation or more advanced source coding schemes. This source coding and decoding is carried out by codec equipment.

Según lo interpretado en el párrafo conteste las siguientes preguntas en CASTELLANO:

1. What is data communication?
2. What is analog transmission?
3. How are messages represented?
4. What is the data transmitted?

MODELO 11

Data analysis

Data analysis is the process of inspecting, cleansing, transforming, and modeling data with the goal of discovering useful information, informing conclusions, and supporting decision-making. Data analysis has multiple facets and approaches, encompassing diverse techniques under a variety of names, and is used in different business, science, and social science domains. In today's business world, data analysis plays a role in making decisions more scientific and helping businesses operate more effectively.

Data mining is a particular data analysis technique that focuses on statistical modeling and knowledge discovery for predictive rather than purely descriptive purposes, while business intelligence covers data analysis that relies heavily on aggregation, focusing mainly on business information. In statistical applications, data analysis can be divided into descriptive statistics, exploratory data analysis (EDA), and confirmatory data analysis (CDA). EDA focuses on discovering new features in the data while CDA focuses on confirming or falsifying existing hypotheses. Predictive analytics focuses on the application of statistical models for predictive forecasting or classification, while text analytics applies statistical, linguistic, and structural techniques to extract and classify information from textual sources, a species of unstructured data. All of the above are varieties of data analysis.

Data product

A data product is a computer application that takes data inputs and generates outputs, feeding them back into the environment. It may be based on a model or algorithm. For instance, an application that analyzes data about customer purchase history, and uses the results to recommend other purchases the customer might enjoy

Según lo interpretado en el párrafo conteste las siguientes preguntas en CASTELLANO:

1. What is data analysis and what is its objective?

2. What is data mining?

3. What does text analysis apply?

4. What is the data product?

MODELO 12

Programming language theory

Programming language theory (PLT) is a branch of computer science that deals with the design, implementation, analysis, characterization, and classification of formal languages known as programming languages. Programming language theory is closely related to other fields including mathematics, software engineering, and linguistics. There are a number of academic conferences and journals in the area.

Formal semantics is the formal specification of the behaviour of computer programs and programming languages. Three common approaches to describe the semantics or "meaning" of a computer program are denotational semantics, operational semantics and axiomatic semantics.

Type theory is the study of type systems; which are "a tractable syntactic method for proving the absence of certain program behaviors by classifying phrases according to the kinds of values they compute".[4] Many programming languages are distinguished by the characteristics of their type systems.

Program analysis is the general problem of examining a program and determining key characteristics (such as the absence of classes of program errors). Program transformation is the process of transforming a program in one form (language) to another form.

Comparative programming language analysis seeks to classify programming languages into different types based on their characteristics; broad categories of programming languages are often known as programming paradigms.

Metaprogramming is the generation of higher-order programs which, when executed, produce programs (possibly in a different language, or in a subset of the original language) as a result.

Según lo interpretado en el párrafo conteste las siguientes preguntas en CASTELLANO:

1. What is programming language theory?
2. What is formal semantics?
3. What is type study?
4. What is metagramming?