INTRODUCTION TO DATABASES

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ASSIGNMENT -1

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**Question #1 – 19 marks**

Thoroughly describe the concept of a database and why they are so important. Include examples.

ANSWER

Information gathered and organized to facilitate easy retrieval organization and modification is referred to as a database. Computer databases are typically used to store collections of data records or files containing a variety of information types, such as financial data, customer information sales truncation data, and product information.

They are used to store, maintain, and access any sort of data. It collects information about people, places, or things. Data is stored, managed, and retrieved with databases. Information about individuals, locations, or entities is gathered by them. All the relevant information is collected and stored in a single location to be observed and analyzed.

Databases are very crucial for the 21st century. They are used for storing the data of various businesses such as grocery stores, banks, restaurants, online stores, hospitals, and many more for making wise decisions in life. For instance, using applications for tracking their fitness, such as Fitbit wristband. The way this app or device works is that it tracks your daily activities. how far you have walked and run in a day , how many calories you have burned, and how long have you slept. They create the database of all your activity and can visualize it by making a graphical analysis that is viewed either through the app or website.

Lutkevich, B. (n.d.). DATABASE MANAGAMENT. TECHTARGET. https://www.techtarget.com/searchdatamanagement/definition/database#:~:text=A%20database%20is%20information%20that,data%2C%20financials%20and%20product%20information.

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Q 2 Using a diagram, explain the database system environment to your audience as well as the functions of a database management system (DBMS). Provide an effective example to complete your explanation.

A database environment is a collective system of components that comprise and regulate the group of data, management, and use of data which consist of software, hardware, people, techniques of handling the database, and the data also. Within a database environment, the computers and computer accessories used for database administration are referred to as hardware. Software, on the other hand, includes database management software like Microsoft SQL as well as the operating system and application programs. SQL and Access. again, people who administer and make use of the system are the people who are included in a database setting. the data, which consists of a collection of facts and information kept in the database system as well as the guidelines concepts and instructions given to both people and software, comprise the techniques.

**A diagram of software

Description automatically generated**

**(n.d.). Database environment. W3school. https://www.w3schools.in/dbms/database-environment#:~:text=A%20database%20environment%20is%20a,database%2C%20and%20the%20data%20also.**

A database management system, to put it simply does the following things: It organizes your database files and gives users more control and accessibility over their data. To do this, users can create, edit, and update data as needed by using a database mangement system (DBMS), which gives users the ability to change the data kept in their database files. For example, you are likely aware that sports stores(decathlon sports – I used to work there in the past) utilize databases to handle and oversee their inventories, keep track of sales, and provide personalized coupons by analyzing customers' purchase histories. You may not realize this, but both online streaming services and major chain sports stores have a habit of monitoring and collecting data on various things such as what type of sports equipment use are purchasing as well as how you paid for the item ( debit card, credit card or cash ). Organizing the events in the store to store your data like mail or numbers and then give coupons to them. Other than this, using a database department can know what are the needs of the customer and how we can attract the customers.by this we can conclude that a database is very important for large industries , small businesses and for personal use.

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**Question #3 – 19 marks**

Thoroughly discuss what business rules are, where they come from, how they are used, and why they are so important for database development. Provide and discuss a few examples.

A business rule is a brief precise and unambiguous description of a policy, policy, procedure, or principle within a specific organization. In a sense, business rules are misnamed: they apply to any organization large or small – a business a government, a religious group, or a research laboratory – that stores and uses data to generate information.

Business rules are derived from a detailed description of an organization’s operations help to create and enforce actions within that organization’s environment. Business rules must be rendered in writing and updated to reflect any change in the organization’s environment.

They are used to define the entities, attributes, relationships, and constraints. Whenever we see a relationship statement such as “an agent can serve many customers, and each customer can be served by only one agent,”.

They provide Data integrity – business rules help maintain the integrity of data by defining constraints and validation criteria. These rules ensure that the database is accurate consistent and complete preventing errors. Data transformation – business rules guide the process of transforming raw data into meaningful information. They define the calculation aggregation and other operations required to convert data into useful insights that can be leveraged for strategic decision–making and analysis. Workflow management is a business rule that dictates the flow of data through various processes and systems within an organization. they determine the sequence of tasks and events required to complete specific business processes ensuing that data moves efficiently and accurately between systems and stakeholders.

(n.d.). Database management. RelationalDBdesign. <https://www.relationaldbdesign.com/database-design/module4/business-rules-importance.php#:~:text=Database%20Business%20Rules%20Importance%201%20Data%20Integrity%3A%20Business,be%20accessed%2C%20modified%2C%20or%20deleted.%20...%20More%20items>

An example of business rules is dynamic pricing strategy it changes prices based on external factors. They are also constant. They also sometimes do the price fluctuation within a matter of a minute. Their main aim is to sell the same product at different prices under different circumstances. Airline industries commonly use this strategy. Furthermore, fraud protection in banks uses this rule-based automation to prevent suspicious activities transactions, and claims. authentication procedures in the bank are triggered using business rules. For instance, when large amounts of credit card transactions happen, the bank’s fraud prevention department needs to contact the client and ask them to authenticate the transactions.

Developer, W. (2023, August 16). *Business rules: How they work & How to use them*. Cflow. https://www.cflowapps.com/business-rules/#:~:text=An%20example%20of%20a%20business,avoiding%20confusion%20among%20your%20employees.&text=Businesses%20should%20have%20rules%20in%20place%20to%20ensure%20their%20success.

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| --- | --- | --- | --- | --- |
|  | | **Out Of** | **Self-Assess** | **Achieved** |
|  | **Question #1** |  |  |  |
|  | Quantity of meaningful details. | 5 | 4.5 | 5 |
|  | Effective description of the details, demonstrating knowledge. | 5 | 4 | 5 |
|  | Provided examples. | 5 | 4 | 5 |
|  | Written and/or spoken aspects are clear, concise and their delivery ensured effective communication of the facts. | 2 | 1.5 | 2 |
|  | Included visual aspects are meaningful, presented clearing and effectively support the written/spoken aspects. | 2 | 1.5 | 2 |
|  |  |  |  |  |
|  | **TOTAL** |  | / 19 | / 19 |
|  | **Question #2** |  |  |  |
|  | Quantity of meaningful details. | 5 | 5 | 5 |
|  | Effective description of the details, demonstrating knowledge. | 5 | 4.5 | 5 |
|  | Provided examples. | 5 | 4.5 | 5 |
|  | Written and/or spoken aspects are clear, and concise and their delivery ensured effective communication of the facts. | 2 | 1.5 | 2 |
|  | Included visual aspects are meaningful, presented clearly and effectively support the written/spoken aspects. | 2 | 1.5 | 2 |
|  |  |  |  |  |
|  | **TOTAL** |  | / 19 | / 19 |
|  | **Question #3** |  |  |  |
|  | Quantity of meaningful details. | 5 | 4.5 | 5 |
|  | Effective description of the details, demonstrating knowledge. | 5 | 4 | 5 |
|  | Provided examples. | 5 | 4 | 5 |
|  | Written and/or spoken aspects are clear and concise and their delivery ensures effective communication of the facts. | 2 | 1.5 | 2 |
|  | Included visual aspects are meaningful, presented clearly, and effectively support the written/spoken aspects. | 2 | 1.5 | 2 |
|  |  |  |  |  |
|  | **TOTAL** |  | / 19 | / 19 |
|  |  |  | 48 | / 57 |