ST10231624 DBA6211 Assignment 1

Question 1

Description of DBMS

A database management system is a program designed to help with the storage, management and retrieval of data in a database.

Components of it

1. Hardware
   this refers to physically tangible tools that can be used to run programs necessary for the database management system.
2. Data
   This is the actual information that is going to be stored into the data base management system which has been loaded into the hardware like the computer or the server.
3. People
   These are the professionals with the necessary knowledge and skill to create, manage and use the data base.
4. Procedures
   These refers to the protocols processes that need to be followed in order to do anything to the data on the base management system program on hardware.
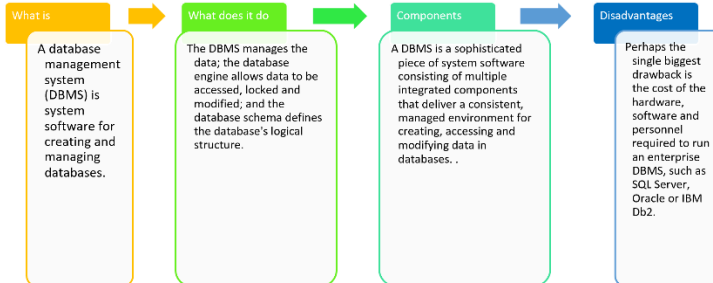5. Software

Examples of components

1. Hardware
   a. Computers and servers
2. Data
   a. Information about different subjects like people, organisations, objects,
3. People
   a. Data analysts
   b. Software engineers
   c. Web developers
   d. Projects managers
4. Procedures
   a. Uploading or storing data
   b. Managing data
   c. Retrieving data

Infographic In Landscape

Database Management System

Overview

| What is	What does it do	Components	Disadvantages
A database management system (DBMS) is system software for creating and managing databases.	The DBMS manages the data; the database engine allows data to be accessed, locked and modified; and the database schema defines the database's logical structure.	A DBMS is a sophisticated piece of system software consisting of multiple integrated components that deliver a consistent, managed environment for creating, accessing and modifying data in databases. .	Perhaps the single biggest drawback is the cost of the hardware, software and personnel required to run an enterprise DBMS, such as SQL Server, Oracle or IBM Db2.

Why have a DBMS'

It offers data abstraction and independence;

It provides an efficient handler to balance the needs of multiple applications using the same data;

A DBMS provide data security as the data is not easily retrieved as in most cases is protects by a passcode.

Components of a DBMS
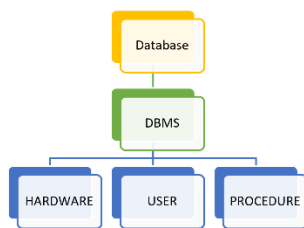
```
        Database
           |
         DBMS
     /     |     \
HARDWARE  USER  PROCEDURE
```

Description of components

1. Storage engine. This basic element of a DBMS is used to store data.
2. DBMS. This is a software system that will help manage the data
3. People. This is the person (hopefully a professional) who uses the DBMS to get the database.
4. Hardware. These are the physical devices to run the system.
5. Procedure. These are the steps that need to be followed to get, manipulate the data and its systems
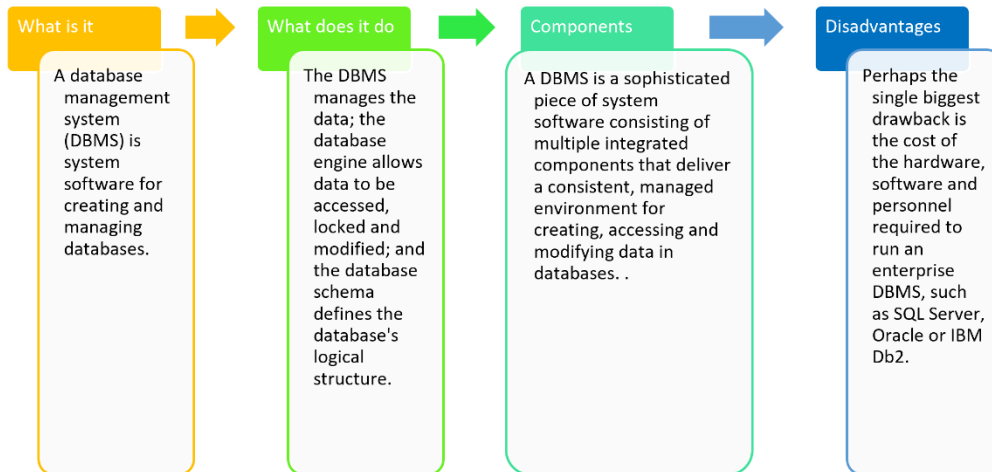
Usage of DBMS'

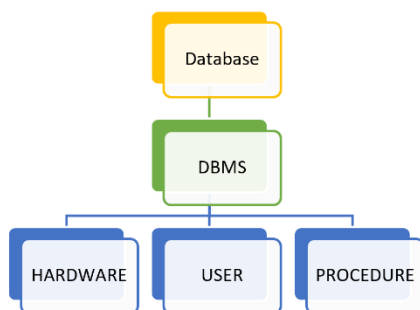■ MySQL   ■ Microsoft SQL server
■ Microsoft Access   ■ PostgreSQL
■ MongoDB

portrait version of the infographic

Database Management System

Overview

What is it	What does it do	Components	Disadvantages
A database management system (DBMS) is system software for creating and managing databases.	The DBMS manages the data; the database engine allows data to be accessed, locked and modified; and the database schema defines the database's logical structure.	A DBMS is a sophisticated piece of system software consisting of multiple integrated components that deliver a consistent, managed environment for creating, accessing and modifying data in databases. .	Perhaps the single biggest drawback is the cost of the hardware, software and personnel required to run an enterprise DBMS, such as SQL Server, Oracle or IBM Db2.

Components of a DBMS

Database
DBMS
HARDWARE   USER   PROCEDURE

Description of components

1. Storage engine. This basic element of a DBMS is used to store data.
2. DBMS. This is a software system that will help manage the data
3. People. This is the person (hopefully a professional) who uses the DBMS to get the database.
4. Hardware. These are the physical devices to run the system.
5. Procedure. These are the steps that need to be followed to get, manipulate the data and its systems

Why have a DBMS'

It offers data abstraction and independence;

It provides an efficient handler to balance the needs of multiple applications using the same data;

A DBMS provide data security as the data is not easily retrieved as in most cases is protects by a passcode.

Usage of DBMS'

- MySQL
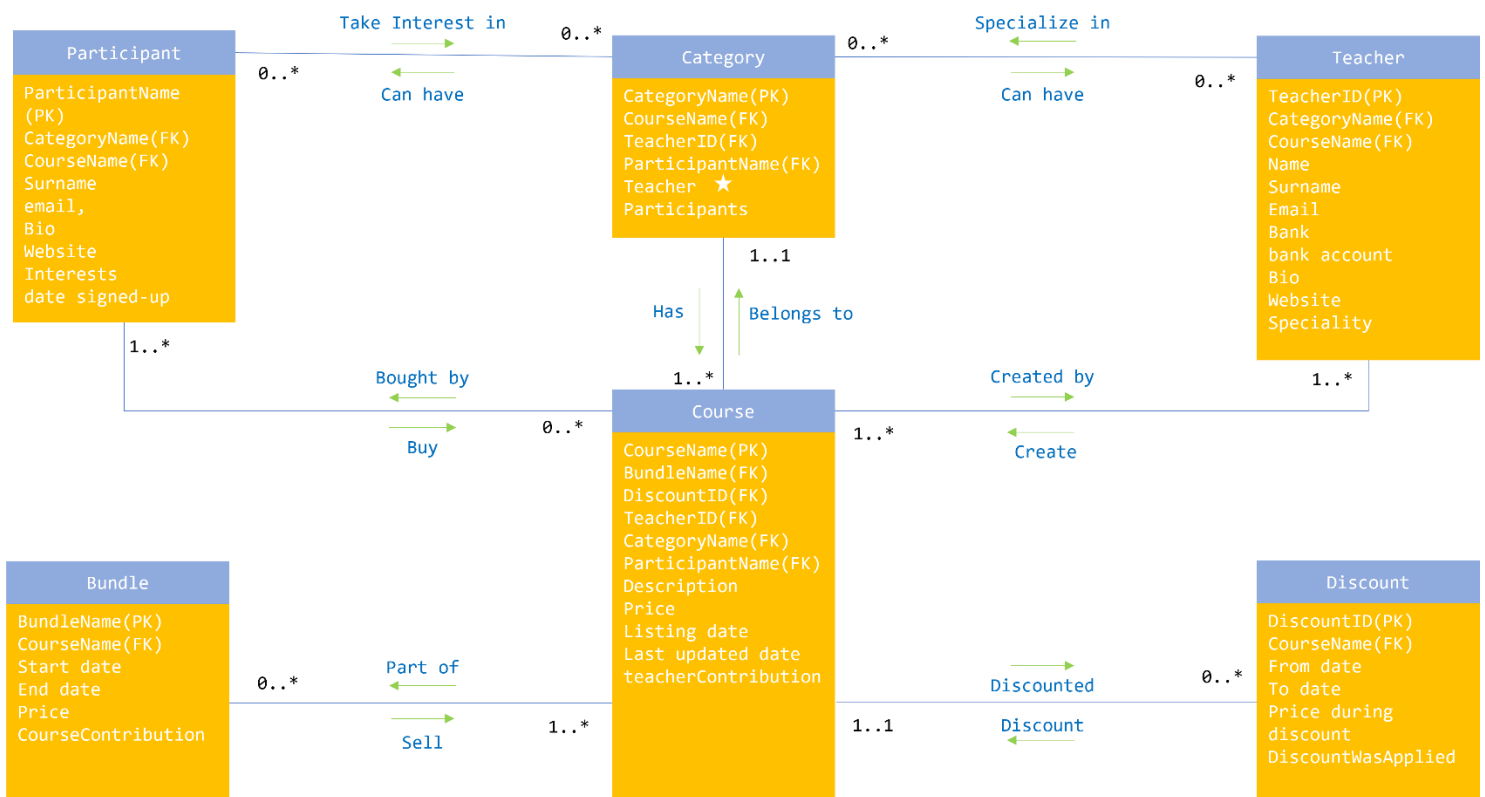- Microsoft SQL server
- Microsoft Access

Question 2

2.1
Relational data base, because the different variables relate and can thus be shown effectively in form of a hierarchy and or table. Moreover, the data that needs storing works with values of variable like name and course, which is depicted well in a table.

2.2
NoSQL because the data is based on courses that may not relate. Moreover, this data example a video or a document for students will not fit well in a table.

Question 3

Participant
ParticipantName (PK)
CategoryName(FK)
CourseName(FK)
Surname
email,
Bio
Website
Interests
date signed-up

Take Interest in   0..*

Can have   0..*

Category
CategoryName(PK)
CourseName(FK)
TeacherID(FK)
ParticipantName(FK)
Teacher ★
Participants

Specialize in   0..*

Can have   0..*

Teacher
TeacherID(PK)
CategoryName(FK)
CourseName(FK)
Name
Surname
Email
Bank
bank account
Bio
Website
Speciality

Has   1..1   Belongs to

1..*   Bought by   0..*

Buy   1..*

Course
CourseName(PK)
BundleName(FK)
DiscountID(FK)
TeacherID(FK)
CategoryName(FK)
ParticipantName(FK)
Description
Price
Listing date
Last updated date
teacherContribution

1..*   Created by   Create   1..*

1..*

Bundle
BundleName(PK)
CourseName(FK)
Start date
End date
Price
CourseContribution

Part of   0..*

Sell   1..*

Discounted   1..1   Discount   0..*

Discount
DiscountID(PK)
CourseName(FK)
From date
To date
Price during discount
DiscountWasApplied

Question 4

10 Changes Thato should make are:

1. Make sure you get all entities and relationships down, this is so that when its time to create a database all entities are accounted for.
2. Use entity names that are identical with those found on the business rules as opposed to using synonyms, because this will avoid confusion and create consistency.
3. Label foreign keys and use round brackets as that's the standard practice and because this ensures that records are valid in the database.
4. Label all primary keys and use round brackets as that's the standard practice, because these uniquely identify records in a database and without them it hard to.
5. Add multiplicity on both ends of all relationships of entities, because it gives an idea of how many instances an entity can associate with another.
6. Lebel the relationships entities have because this influences the cardinality after getting the business rule without it, it may be hard to understand cardinality if written down.
7. Centre the entity with the most relations with other entities. This helps create clarity and makes the ERD easier to read and understand especially when its time to create the database.
8. Add quantity attribute because it helps give an understanding of how many units of a component is needed.
9. Include a relationship between supplier and component because the business rule states that there is a relationship between the two (see bullet point 4).
10. Add name and address attribute to the supplier entity, so that the table resulting from supplier has attributes to put data into.
    - Add the product-line entity and relate the product-line to product (item), because it's the entity that creates products and it's a business rule (see bullet point 6).
    - Give the product line entity a colour attribute as its described in the business rules and cancel the entity colour and its relationships because it does not follow the business rule as it is listed as an attribute of a product line and not a standalone entity (see bullet point 7).
    - Use software, because it will make it neater, and easily distributed to another party when necessary.