Tutorial 1 & 2

1. Explain TWO (2) application areas of the database system.

-(alex)Education, for schools and colleges use databases for course registration and record of results.

-(danny) Sales, use for storing customers, products & sales information.

1. Recommend **TWO (2)** factors when choosing the types of databases.

* **number of users can access at a time**
* **system responding time** in which time taken by the database system to react to users’ instructions
* (cc) Functionality. The modules should be able to meet business requirements like extract and filter data, insight, analysis, or can help in forecasting strategy.
* (xiaozu) Efficiency. Data is added all the time, so the system must be able to store huge data along the time and it wouldn’t affect the response time.

1. File-based systems were first developed to store, manipulate and retrieve data but as business applications become more complex, it was evident to have a number of limitations. Describe any **TWO (2)** disadvantages of using a file-based system.

(Liana) **Requires extensive programming** - every task must be done by coding in a third-generation language (3GL), where the programmer must specify the task and how it must be done. It is time-consuming and the access paths become difficult to manage as the system becomes complex, which might produce malfunctions.

(Ching Sheng)**Data inconsistency** -Because of data redundancy, the data may not be in consistent state.

No sharing of files between departments.

1. How can a Database system overcome the problems of File-Based systems?

(kaiyang)

* **No redundant data**: Data redundancy can be removed by data normalization. Without redundant data, more storage can be saved and access time will be greatly improved.
* **Data Security:** Not every user has access to all data from the DBMS, access constraints can be easily applied so that only authorized users can access the data.

(shi xuan)

* **Easy recovery**:It is to do a full recovery data in case of failure since the database system keeps the backup of the data.
* **Privacy**:Limited access means privacy of data.
* **Flexible**: Database systems are more flexible than file processing systems.

(Ram)

* **Data storage management**: It translates the logical requests into commands to physically locate and retrieve the requested data.

1. Describe FIVE (5) main components needed in the database system environment.

(Dennis + Alex + Wai Yi + Amirul) Feel free to make changes~

* **Hardware**
  + Computers are a fundamental requirement for setting up a database.
  + Inputs/Output Devices were required for a database to perform data transmitting.
  + Networking Component allows the data going online.
* **Software**
  + Operating System was a fundamental part of setting up a database server.
  + The Data Management System enables the management of datas.
* **People**
  + End-Users is the data consumer or origin of datas.
  + IT personnels perform computer-based tasks.
* **Data**
  + Database was the host of database system environment factors.
  + Company Information keeps the computer-based information.
  + Users Data keeps the end-users data.
* **Procedure** 
  + Rules, policy and enforcement.

1. A database management system (DBMS) performs several important functions to ensure the integrity and consistency of a data in the database. Briefly **explain** any FOUR (4) functions of a DBMS. (Jordan, Esther)

* **Data integrity management**
  + promotes and enforces integrity rules to eliminate data integrity problems
* **Database access languages and application programming interfaces**
  + provides data access through a query language
* **Database communication interfaces**
  + allows database to accept end-user requests within a computer network environment
* **Security management**
  + enforces user security and data privacy within the database
* **Multi-user access control**
  + creates structures that allow multiple users to access the data
* **Backup and recovery management**
  + provides backup and data recovery procedures
* **Data dictionary management**
  + defines data elements and their relationships
* **Data storage management**
  + store data and related data entry forms, report definitions, etc.
* **Data transformation and presentation**
  + translates logical requests into commands to physically locate and retrieve the requested data