**Tutorial 1**

**Tutorial Questions**

1. Compare and contrast between the main characteristics of the database and file-based approach.

Database is structured and reduces redundancy by relating the data with another data. But in the file-based approach we must duplicate files to relate the data which creates redundancy.

1. Describe four government sectors that would be expected to make use of database systems

NHS, Police Records, Birth Registration, Immigration

1. What is meant by the terms:
   1. Database – It is a collection of information which is processed.
   2. Database Management System – It is a software to interact with the database
   3. Database Application Program – It is the software which is created by a developer, and it interacts with the database.
   4. Data Independence – Separation of data which are not logically important for the database
   5. Security – Making sure the database is secured from unauthorized access
   6. Integrity – Validity and consistency of data and making sure the data is stored with a unique id
   7. Views – It is the representation of information in a organized way to make the data understandable
2. Describe the role of database management systems (DBMS) in the database approach. Discuss why knowledge of DBMS is important for database administrators.

DBMS provides a way to interact with the database which is database approach. This database approach helps the database administrators to manage the database.

1. Describe the five components of the DBMS environment.

Hardware, Software, Procedure, Data, and People

1. What are the advantages of database management systems? Are there any potential disadvantages?

Advantages:

Easy access, Data Sharing, Role Based Access Control, Data Validation, Consistency of data.

Disadvantages:  
Complexity, Costly, Data Breach Risk

1. Discuss the roles of the following personnel in the database environment:
2. Data Administrator – Designs the policy which data is essential
3. Database Administrator – The person who controls database and manage it
4. Logical Database Designer – The person who ensures collected data is logically corelated
5. Physical Database Designer – The person who decides the appearance of data in a organized way
6. Application Developer - The software developer who creates the program and interact with database
7. End-Users – users of the software
8. Discuss the three generations of DBMSs.

Hierarchical – It is like a tree one comes after another

Relational – It can relate one data with another data

Object-Oriented – It creates instances of an object and stores the data related to the object

1. Why are views an important aspect of database management systems?

Views are the appearance of the information in a structured way which helps the End-Users to understand the data.

**Directions**:

1. Avoid Plagiarism
2. Copy Pasting (each other work) is strictly prohibited (will be awarded ‘zero’)

**Test yourselves by answering the following MCQs :**

1. Which of the following is a characteristic of the database approach compared to the file-based approach?

a. Redundant data

b. Centralized data control

c. Limited data security

d. Inflexible data structure

2. In which government sector would you expect to find database systems commonly used?

a. Postal services

b. Department of Defence

c. Public libraries

d. All of the above

3. What does "Database" refer to in the context of information systems?

a. A collection of files

b. A structured set of data

c. A computer hardware component

d. A software application

4. Why is knowledge of Database Management Systems (DBMS) important for database administrators?

a. DBMS knowledge is not relevant for administrators.

b. DBMS automates all database tasks.

c. DBMS ensures data security but is not essential for administrators.

d. DBMS is used to create, maintain, and manage databases.

5. Which of the following is one of the components of the DBMS environment?

a. Database query

b. Database application

c. Database table

d. Database schema

6. Which of the following is a potential disadvantage of database management systems (DBMS)?

a. Improved data security

b. Enhanced data sharing

c. Data redundancy reduction

d. High initial setup costs

7. What is the primary role of End-Users in the database environment?

a. Designing database schemas

b. Developing database applications

c. Using the database to retrieve and input data

d. Managing database security

8. Which generation of DBMS introduced the concept of the relational data model?

a. First generation

b. Second generation

c. Third generation

d. Fourth generation

9. What is the primary purpose of database views?

a. To increase data redundancy

b. To simplify data retrieval for users

c. To eliminate the need for indexing

d. To improve data integrity

10. How is data integrity typically maintained in a relational database system?

a. By using unstructured data

b. Through data redundancy

c. Using primary keys, foreign keys, and constraints

d. By allowing direct access to the database files