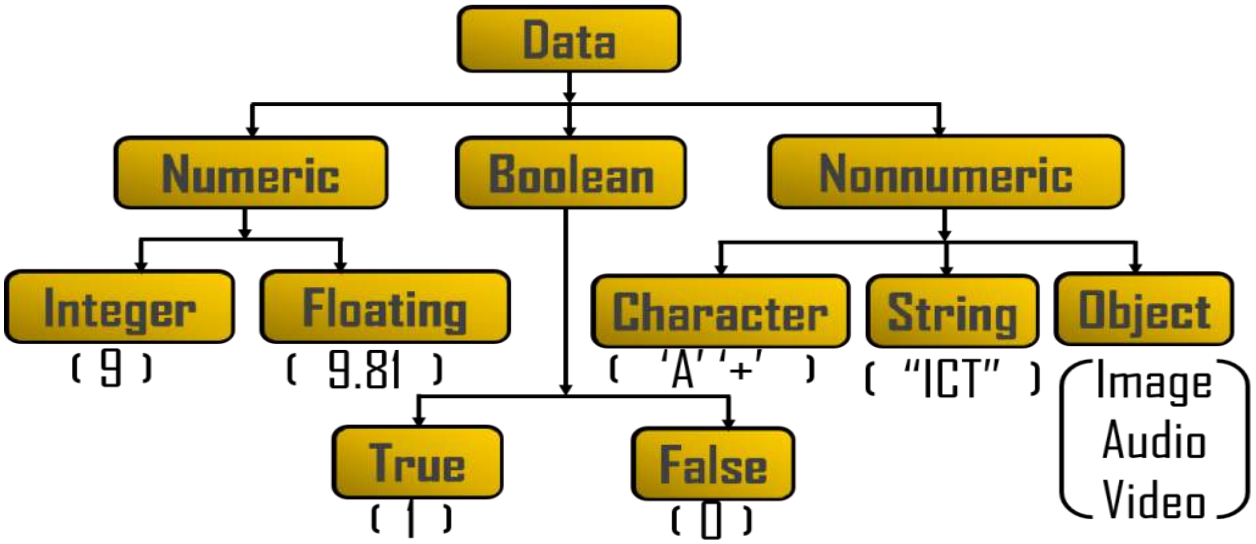
Sixth Chapter Lesson-1: Concept of Database.

At the end of this lesson-

- 1. You will be able to explain data and information.
- 2. You will be able to distinguish data over information.
- 3. You will be able to explain data hierarchy.
- 4. You will be able to explain the advantages and disadvantages of database.
- 5. You will be able to describe the application areas of database.

Data: Data is raw, unorganized facts that need to be processed. For getting desired output in a processing data is used as input. Data can be defined as a representation of facts and it is the smallest part of information. Data is represented with the help of characters such as alphabets (A-Z, a-z), digits(0-9) or special characters (+,-,/,*,<,>,=).

Classification of data:



Information: When data is processed, organized, structured or presented in a given context so as to make it useful, it is called information. Information is the processed data on which decisions and actions are taken.

Examples of data and information: The marks of every subject of a student is called data. On the other hand, the report or result of a student by calculating the marks of all subjects is called information.

Difference between data and information:

Data	Information
For getting desired output in a processing data is used as input.	Information is the processed data on which decisions and actions are taken.
Data is a single concept.	Information is a collective concept.
Data doesn't give a complete idea about an object.	Information gives a complete idea about an object.
Data cannot be used directly.	Human being use information directly according to their needs.
There are some classifications of data.	There is no such classification of information.

Database: A database is an organized collection of related data, stored and accessed electronically. A database is used by an organization as a method of storing, managing and retrieving information. Modern databases are managed using a database management system (DBMS). It may have single or related multiple tables in a database.

Data Hierarchy: Data hierarchy is a systematic organization of data mainly in a hierarchical form. Data organization basically involves bit, byte, field, record, file, and database.

<table>
<tr><th>Hierarchy</th><th>Example</th></tr>
<tr><td>Database</td><td>Student Database
Basic info file
Tuition fees file
Result file</td></tr>
<tr><td>File</td><td>Student info files
Name | Section | GPA
Monir | A | 4:50
Kobir | B | 4:60
Rahat | C | 5:00</td></tr>
<tr><td>Record</td><td>Student Record
Name | Section | GPA
Monir | A | 5:00</td></tr>
<tr><td>Field</td><td>Student Name field
Name
Monir</td></tr>
<tr><td>Byte</td><td>01001101 (Letter M in ASCII)</td></tr>
<tr><td>Bit</td><td>0</td></tr>
</table>

Advantages of database:

- 1. Reduced data redundancy.
- 2. Reduced updating errors and increased consistency.
- 3. Greater data integrity and independence from applications programs.
- 4. Improved data access to users through use of host and query languages.
- 5. Improved data security.
- 6. Reduced data entry, storage, and retrieval costs.
- 7. Facilitated development of new applications program.

Disadvantages of database:

- 1. Database systems are complex, difficult, and time-consuming to design.
- 2. Substantial hardware and software start-up costs.
- 3. Damage to database affects virtually all applications programs.
- 4. Extensive conversion costs in moving form a file-based system to a database system.
- 5. Initial training required for all programmers and users.

Application areas of database:

- 1. Banking
- 2. Airlines
- 3. Library
- 4. Educational Institution
- 5. Credit Card
- 6. Telecommunication
- 7. Production and distribution
- 8. Human Resource (HR)
- 9. Automated Teller Machine (ATM)
- 10. Stock/Share Market

Lesson Evaluation-

Knowledge Based Questions:

- a. What is data?
- a. What is information?
- a. What is database?
- a. What is data hierarchy?