Function and Services of DBMS

1. DDL Compiler:
   - Data Description Language compiler processes schema definitions specified in the DDL.
   - It includes metadata information such as the name of the files, data items, storage details of each file, mapping information and constraints etc.
2. DML Compiler and Query optimizer:
   - The DML commands such as insert, update, delete, retrieve from the application program are sent to the DML compiler for compilation into object code for database access.
   - The object code is then optimized in the best way to execute a query by the query optimizer and then send to the data manager.
3. Data Manager:
   - The Data Manager is the central software component of the DBMS also knows as Database Control System.
   - The Main Functions Of Data Manager Are:
     1. Convert operations in user's Queries coming from the application programs or combination of DML Compiler and Query optimizer which is known as Query Processor from user's logical view to physical file system.
     2. Controls DBMS information access that is stored on disk.
     3. It also controls handling buffers in main memory.
     4. It also enforces constraints to maintain consistency and integrity of the data.
     5. It also synchronizes the simultaneous operations performed by the concurrent users.
     6. It also controls the backup and recovery operations.
4. Data Dictionary:
   - Data Dictionary, which stores metadata about the database, in particular the schema of the database.
   - names of the tables, names of attributes of each table, length of attributes, and number of rows in each table.
   - Detailed information on physical database design such as storage structure, access paths, files and record sizes.
   - Usage statistics such as frequency of query and transactions.
   - Data dictionary is used to actually control the data integrity, database operation and accuracy. It may be used as a important part of the DBMS
5. Data Files:
   - Which store the database itself.
6. Compiled DML:
   - The DML complier converts the high level Queries into low level file access commands known as compiled DML.
7. End Users:
   - The second class of users then is end user, who interacts with system from online workstation or terminals.
   - Use the interface provided as an integral part of the database system software.
   3. User can request, in form of query, to access database either directly by using particular language, such as SQL, or by using some pre-developed application interface.
   4. Such request are sent to query evaluation engine via DML pre-compiler and DML compiler
   5. The query evaluation engine accepts the query and analyses it.
   6. It finds the suitable way to execute the compiled SQL statements of the query.
   7. Finally, the compiled SQL statements are executed to perform the specified operation
   8. Query Processor Units:

Interprets DDL statements into a set of tables containing metadata.

Translates DML statements into low level instructions that the query evaluation engine understands.

Converts DML statements embedded in an application program into procedure calls int he host language.

Executes low level instructions generated by DML compiler.

    a. DDL Interpreter
    b. DML Compiler
    c. Embedded DML Pre-compiler
    d. Query Evalution Engine

9. Storage Manager Units

Checks the authority of users to access data.

Checks for the satisfaction of the integrity constraints.

Preserves atomicity and controls concurrency.

Manages allocation of splace on disk.

Fetches data from disk storage to memory for being used.

    . Authorization Manager
    a. Integrity Manager
    b. Transaction Manager
    c. File manager
    d. Buffer Manager

- Functions of DBMS:
  - o DBMS free the programmers from the need to worry about the organization and location of the data i.e. it shields the users from complex hardware level details.
  - o DBMS can organize process and present data elements from the database. This capability enables decision makers to search and query database contents in order to extract answers that are not available in regular Reports.
  - o Programming is speeded up because programmer can concentrate on logic of the application.
  - o It includes special user friendly query languages which are easy to understand by non programming users of the system.
- The service provided by the DBMS includes :-
  - o Authorization services like log on to the DBMS start the database stop the Database etc.
  - o Transaction supports like Recovery, Rollback etc,
  - o Import and Export of Data.
  - o Maintaining data dictionary
  - o User's Monitoring