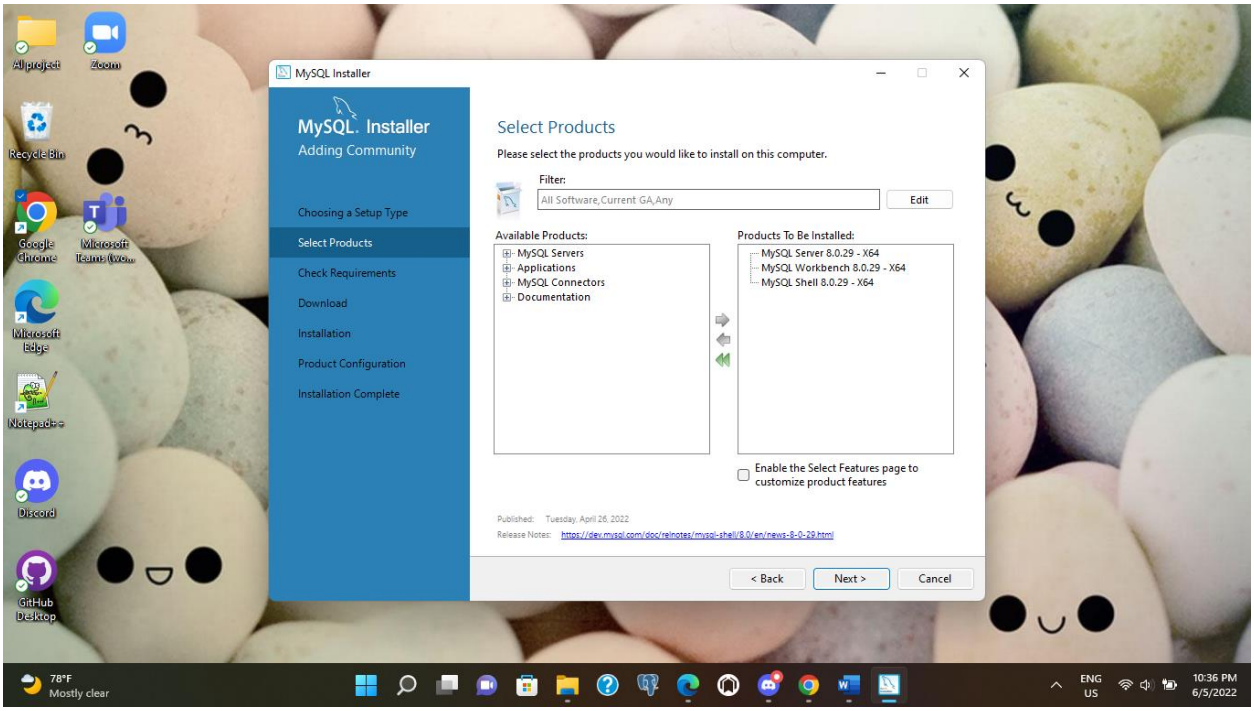
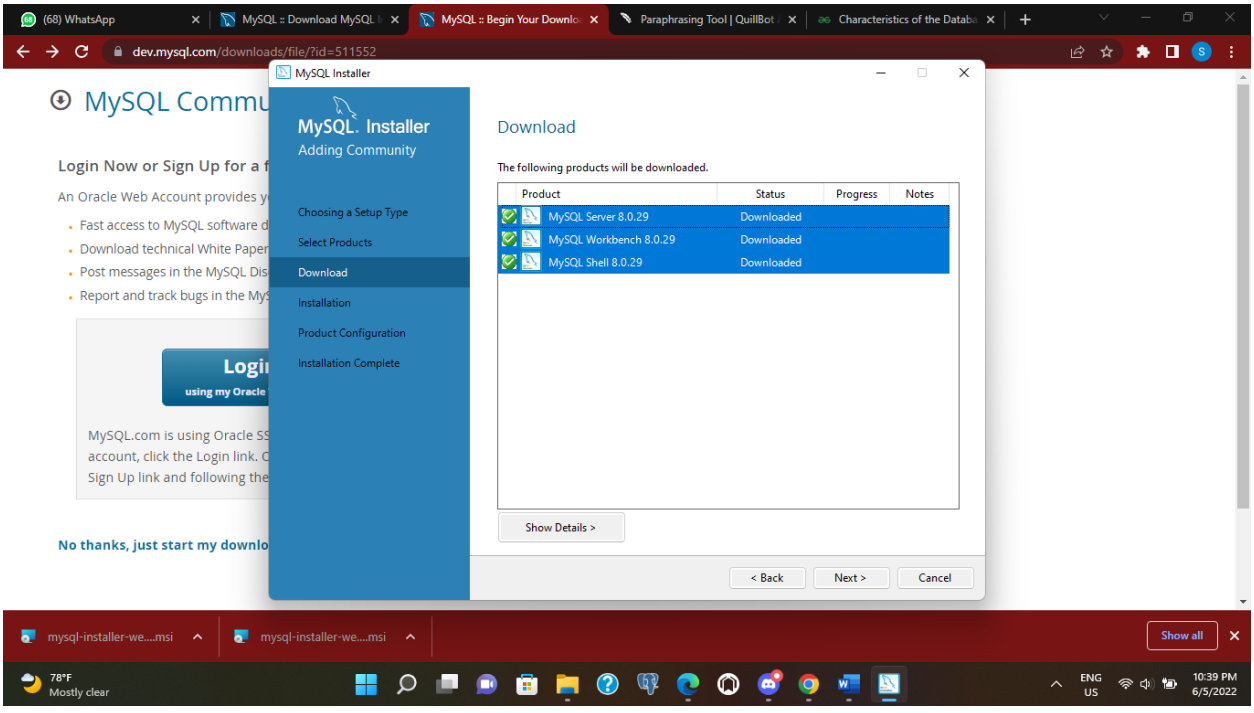
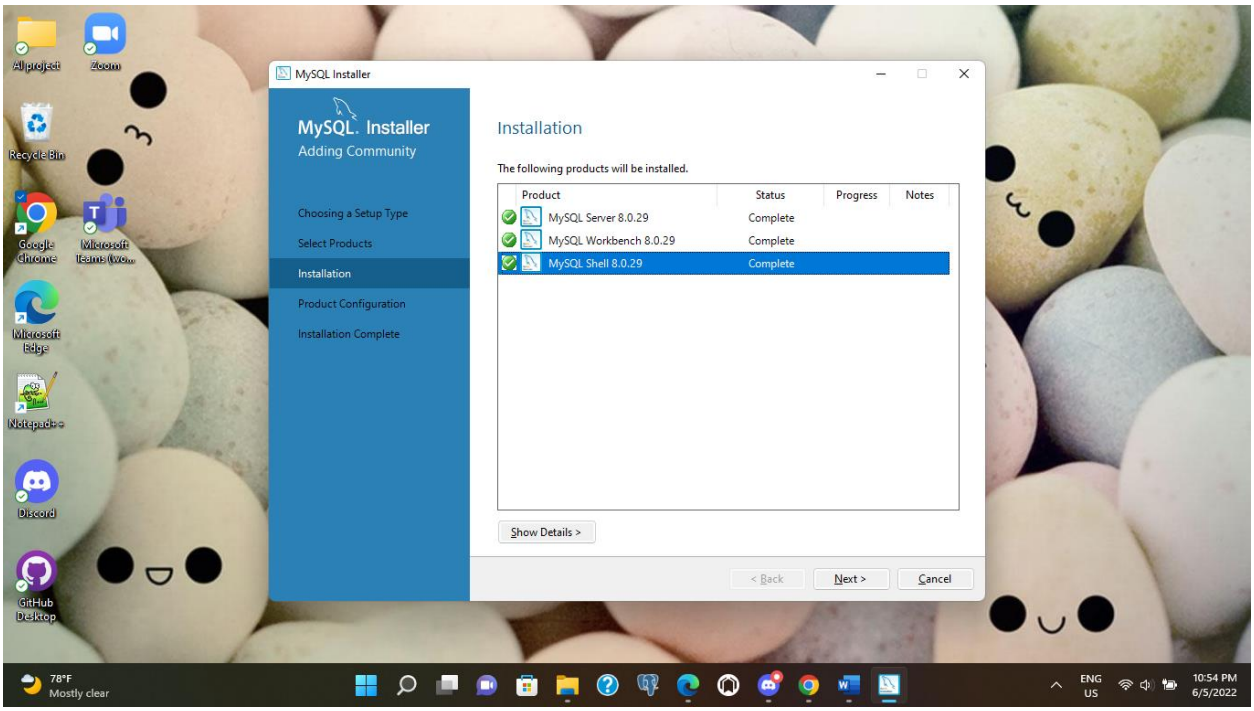
Database Systems Assignment 1

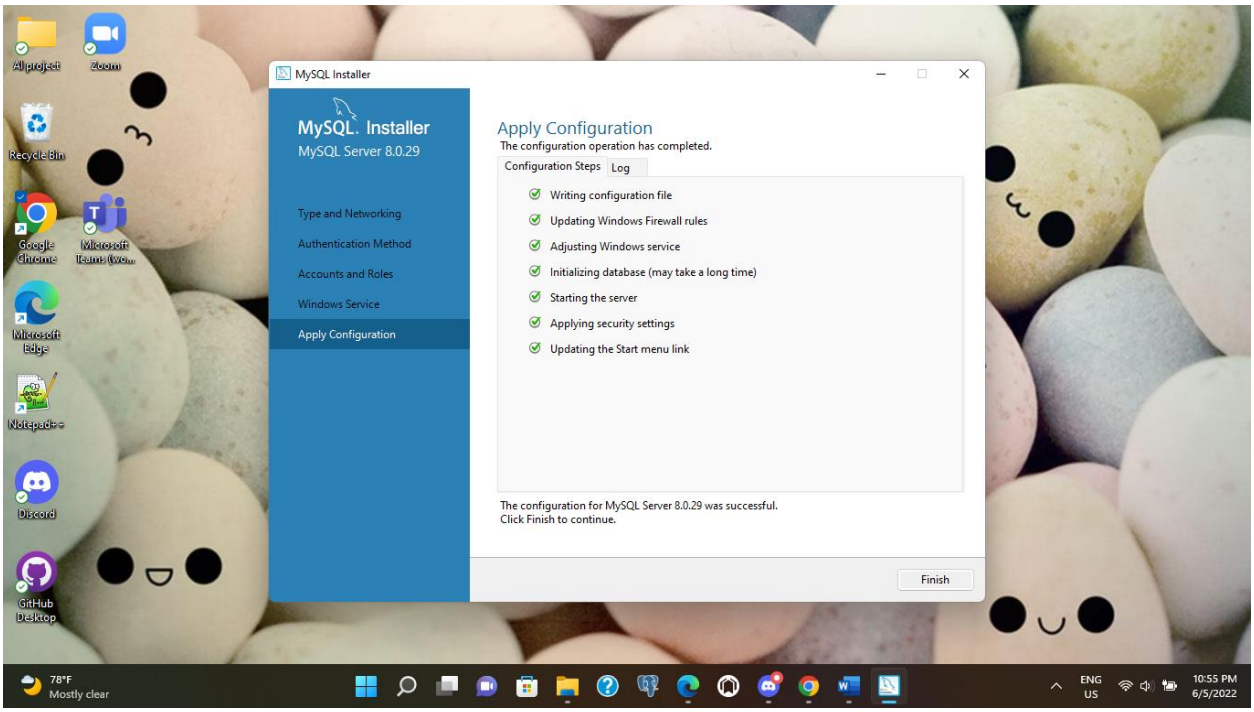
U00839259 (syrrmlla)

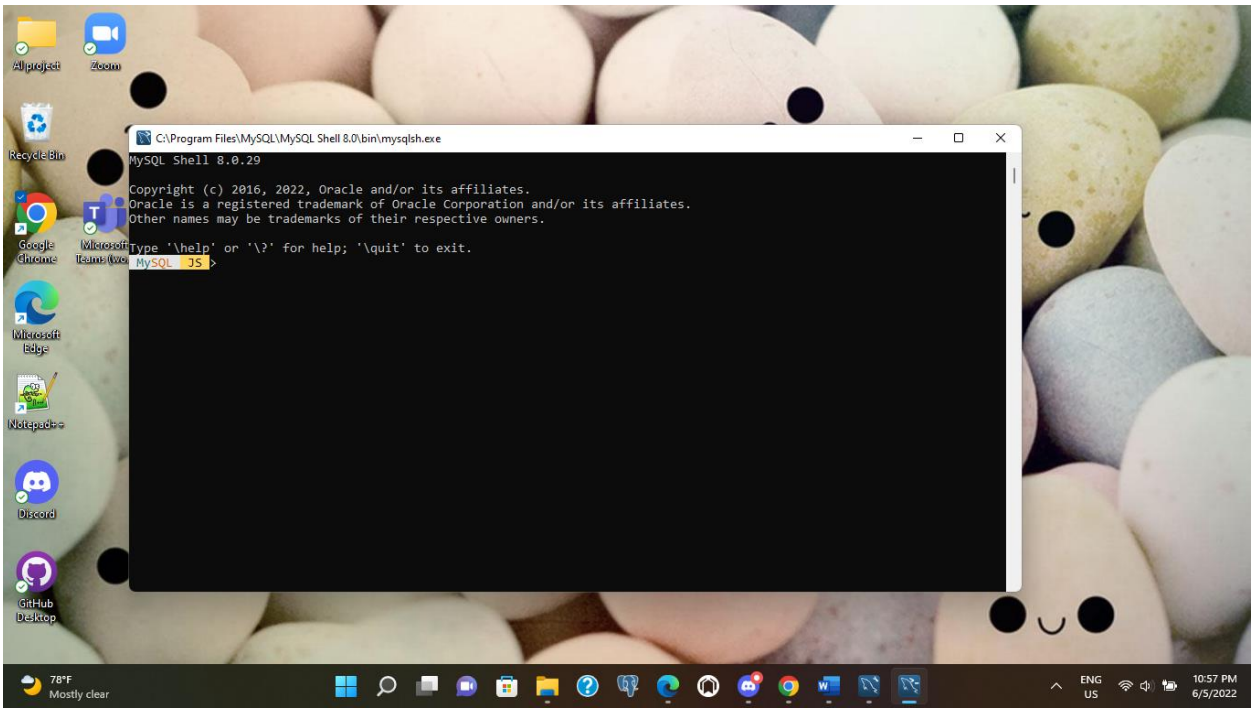
1.

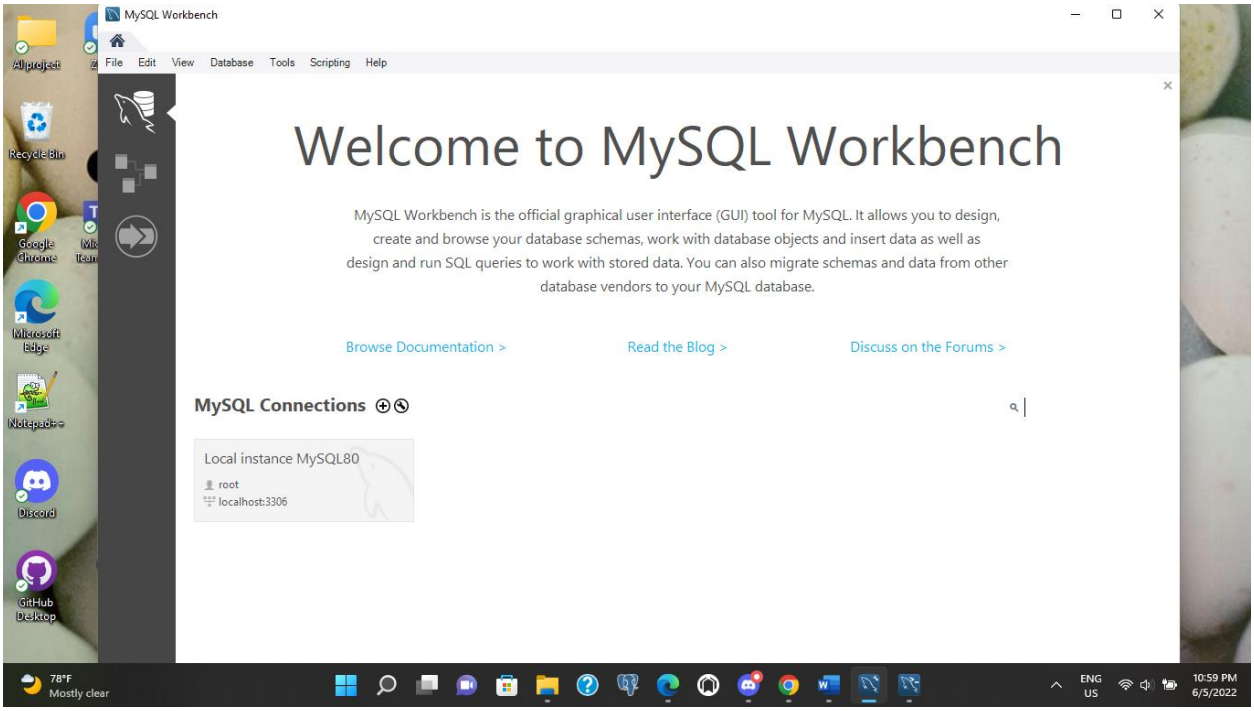


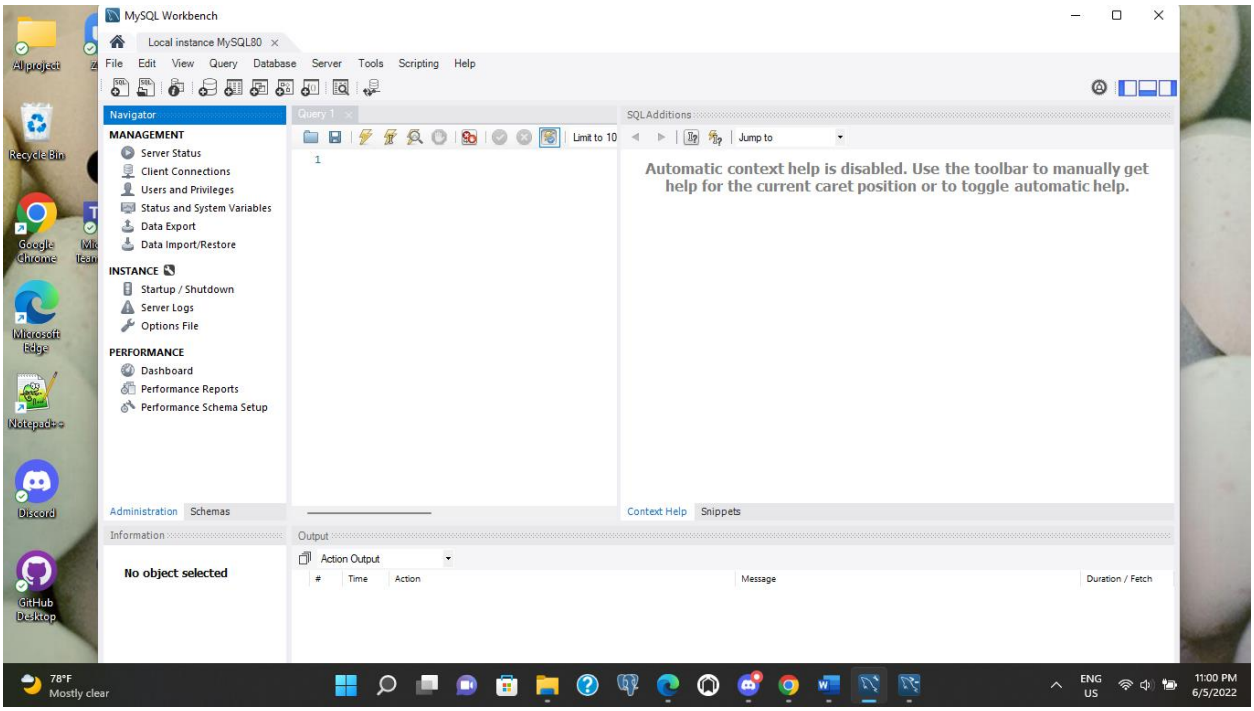



MySQL Installer
MySQL. Installer
Adding Community
Choosing a Setup Type
Select Products
Installation
Product Configuration
Installation Complete
Installation
The following products will be installed.
Product
Status
Progress
Notes
MySQL Server 8.0.29
Complete
MySQL Workbench 8.0.29
Complete
MySQL Shell 8.0.29
Complete
Show Details >
< Back
Next >
Cancel
78°F
Mostly clear
ENG
US
10:54 PM
6/5/2022


MySQL Installer
MySQL. Installer
MySQL Server 8.0.29
Type and Networking
Authentication Method
Accounts and Roles
Windows Service
Apply Configuration
Apply Configuration
The configuration operation has completed.
Configuration Steps
Log
Writing configuration file
Updating Windows Firewall rules
Adjusting Windows service
Initializing database (may take a long time)
Starting the server
Applying security settings
Updating the Start menu link
The configuration for MySQL Server 8.0.29 was successful.
Click Finish to continue.
Finish
78°F
Mostly clear
ENG
US
10:55 PM
6/5/2022


C:\Program Files\MySQL\MySQL Shell 8.0\bin\mysqlsh.exe
MySQL Shell 8.0.29
Copyright (c) 2016, 2022, Oracle and/or its affiliates.
Oracle is a registered trademark of Oracle Corporation and/or its affiliates.
Other names may be trademarks of their respective owners.
Type '\help' or '\?' for help; '\quit' to exit.
MySQL JS


MySQL Workbench
File Edit View Database Tools Scripting Help
Welcome to MySQL Workbench
MySQL Workbench is the official graphical user interface (GUI) tool for MySQL. It allows you to design, create and browse your database schemas, work with database objects and insert data as well as design and run SQL queries to work with stored data. You can also migrate schemas and data from other database vendors to your MySQL database.
Browse Documentation >
Read the Blog >
Discuss on the Forums >
MySQL Connections
Local instance MySQL80
root
localhost:3306



2. The Four main types of actions involved in database are:
    - **Define Database**: Defining database is nothing but define the data like database type, database structure to store data into database. The database descriptive information is also stored by the DBMS in the form of a database catalog or dictionary. It is also called metadata.
    - **Construct Database:** Construct database is the process of storing data in a database so that it can be maintained by the DBMS.
    - **Manipulate Database**: It includes functions such as retrieve the database, inserting the new record into the database, updating, and deleting the database by using appropriate queries.
    - **Share Database:** Share database means to share a database to multiple users so that more than one user or program can access the database at the same time.

3. The Main characteristics of the database approach are:

    - **Self-Describing Nature of a Database system:** The database system contains not only the database itself but also a complete definition or description of the database structure and constraints. This definition is stored is the DBMS catalog, which contains information like structure, type, and storage format of each data.
    - **Insulation between program and data:** The data in database systems is stored independently of the programs that access it. That is, you can change data without affecting the programs; this is known as program operation independence.

- **Support of multiple views of the data:** The database is shared by multiple users, and each user may require different information from the database based on their needs. Each user requirement is a database view.
- **Sharing of data transaction processing:** Using concurrency control software, a multiuser DBMS allows multiple users to access the database at the same time.
- **Security:** DBMS provides methods for improving security by using constraints when entering data into the database and retrieving it later.
- **Query Language:** The query language makes it easier to retrieve and manipulate data. The user can use as many different filtering options as they want.
- **Control of data redundancy:** Each data item in the database approach is kept in only one location. Duplication still exists in certain cases to improve system performance, but it is managed by application programming and kept to a minimum by instituting as little redundancy as possible when creating the database.
- **Data Sharing:** The integration of all data for administration within the database system has numerous advantages. For starters, it enables data sharing between users and others who have access to the system. Second, it enables users to generate more data from a given amount of data than would otherwise be possible.

Difference from traditional file system:

A traditional file system typically stores data in files. Most offer a privilege scheme to limit who can access files.

They frequently include features such as keyed access, partitioning, and encryption. Only a few offers secondary indexes. Some even include transaction manager integration.

All of this and more is provided by a database management system.

A database management system is typically installed on top of a conventional file system (or perhaps several).

It offers a table abstraction, complete with rows and columns. The information is strongly typed. A query language is provided by a database management system that can be used to query and maintain tables.

A query's results are a table that can be stored back into the database if desired.

The database has a protected file system that prevents data loss in the event of an unexpected attack.

4. Redundancy: Redundancy means duplicacy of data in the same database.

Controlled Redundancy:

- It refers to sorting the redundancy as soon as the input is given.
- This speed ups the database access and also improves the performance of queries.

Un-Controlled Redundancy:

- It is an inconsistent state which cannot be sorted or controlled.
- Reduces the performance, no db size, speed will also be less.

The main difference between controlled and uncontrolled redundancy is that with controlled redundancy, methods can be used to combine data that is automatically input, with uncontrolled redundancy, various issues can happen including inconsistent data such as different methods of data structure such as order of DOB information, waste of storage space and the duplication of input data.

5. Types of relationships:

ONE-TO-ONE: A relationship in which a record in one table is exactly linked with only one record in another table.
ONE-TO-MANY: A relationship in which a record in one table is linked to multiple records in another table
MANY-TO-MANY: A relationship in which multiple records in one table are linked to multiple records in another table.
MANY-TO-ONE: A relationship in which multiple records in one table are linked to only one record in another table.

- PREREQUISITE has MANY-TO-ONE relationship with COURSE, because the PREREQUISITE_NUMBER remains different for same COURSE_NUMBER.
- SECTION has ONE-TO-ONE relationship with GRADE_REPORT, because the SECTION_IDENTIFIER remains the same than any other columns.
- COURSE has ONE-TO-MANY relationship with SECTION, because the COURSE_NUMBER remains same for many SECTION_IDENTIFIER.
- STUDENT has ONE-TO-MANY relationship with GRADE_REPORT, because the STUDENT_NUMBER remains same for different SECTION_IDENTIFIER.

6. Traditional file processing makes sense when memory size is small, transaction files are busy, batch processing delays are acceptable and in cases like control totals are important. It is also followed in such applications like where batch processing delays are acceptable.
   Example 1: Traditional file processing system is also used in payroll generating application.
   Example 2: Inventory control, If some stores want manage their Inventory or perform serial audits, traditional file processing system is used.

Example 3: Microsoft NTFS and Apple’s Hierarchical File system also follows traditional file processing system.