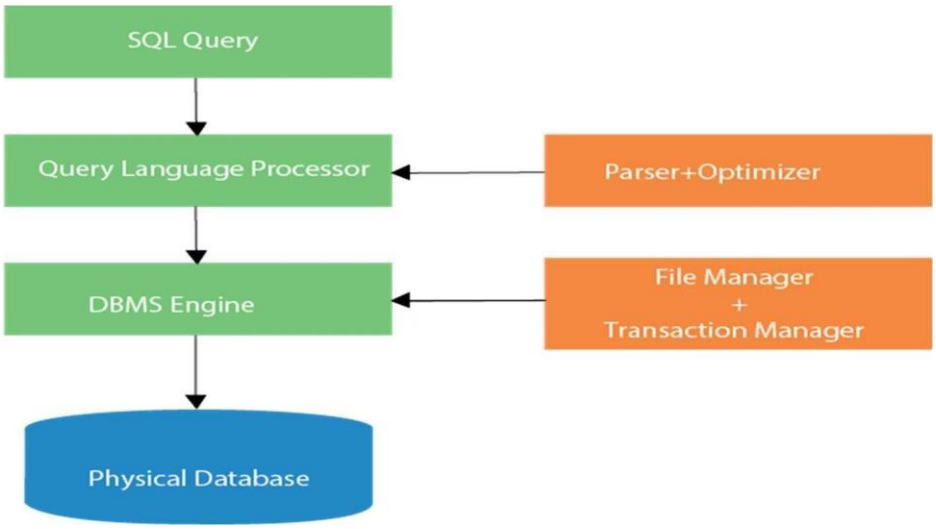
EXPERIMENT 1

- **Aim:**Introduction to SQL and installation of SQL server/Oracle.
- **Intruduction:**SQL stands for Structured Query Language. It is used for storing and managing data in relational database management system (RDMS).It is a standard language for Relational Database System. It enables a user to create, read, update and delete relational databases and tables.All the RDBMS like MySQL, Informix, Oracle, MS Access and SQL Server use SQL as their standard database language.SQL allows users to query the database in a number of ways, using English-like statements.
- **Rules:**

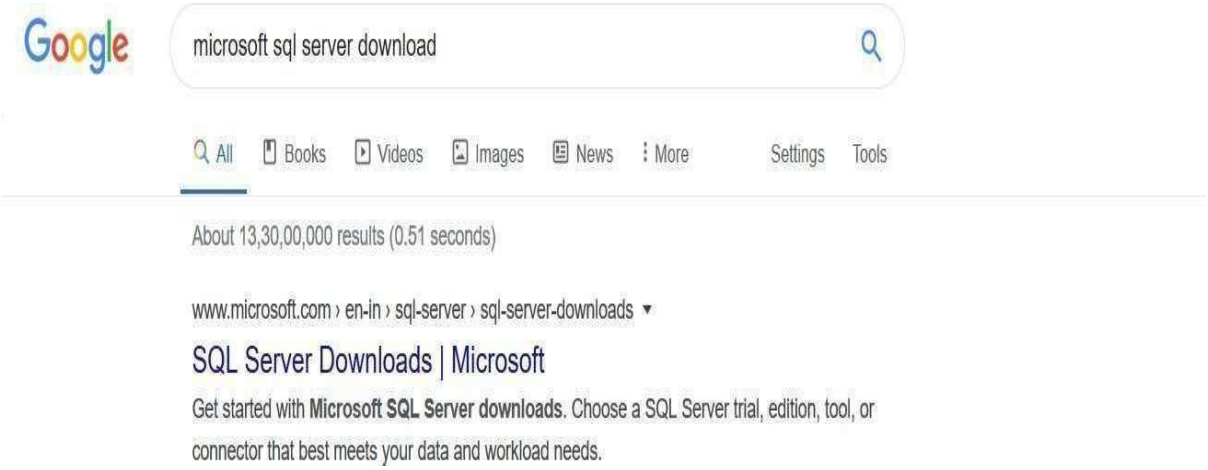
1. Structure query language is not case sensitive. Generally, keywords of SQL are written inuppercase.
2. Statements of SQL are dependent on text lines. We can use a single SQL statement on one or multiple text line.
3. Using the SQL statements, you can perform most of the actions in a database.
4. SQL depends on tuple relational calculus and relational algebra.

- **SQL process:**When an SQL command is executing for any RDBMS, then the system figure out the best way to carry out the request and the SQL engine determines that how tointerpret the task.In the process, various components are included. These components can be optimization Engine, Query engine, Query dispatcher, classic, etc.All the non-SQL queries are handled by the classic query engine, but SQL query engine won't handle logical files.

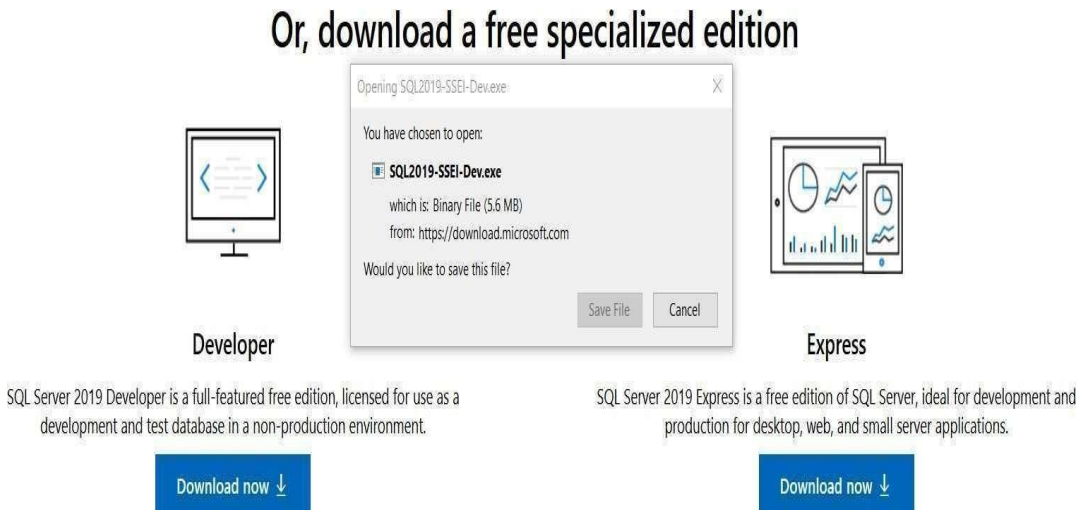


- **Installing SQL**

1. Firstly you have to search on google SQL server download and click on the very first linkthat it shows as shown below. Make sure it is a Microsoft website and not any other third-party site.



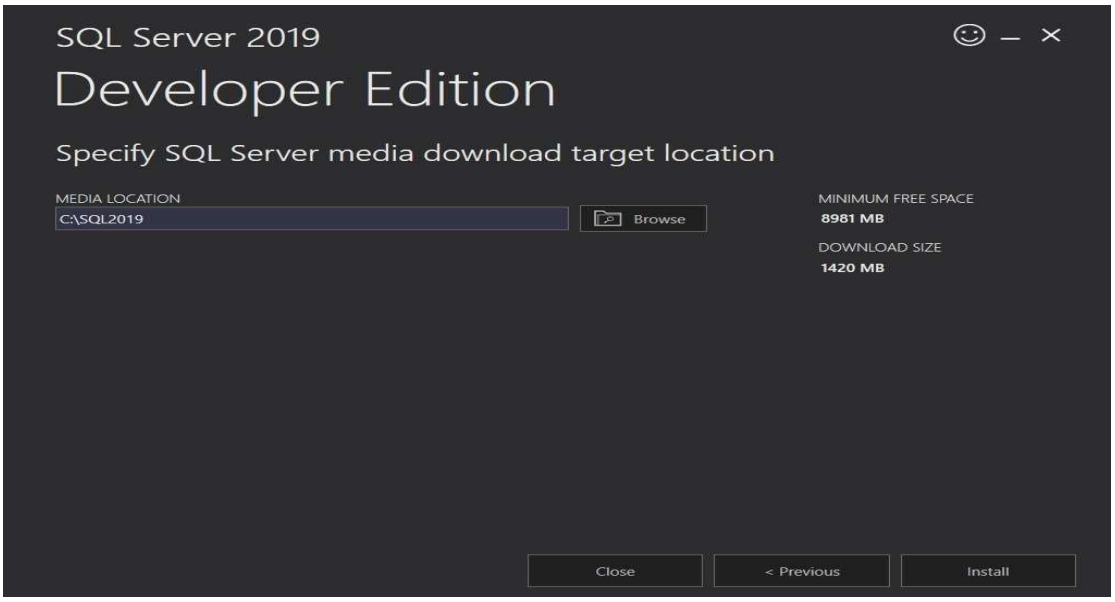
2. Then scroll down and look for Developer edition, click Download Now, and save the file. The developer edition is a full version and comes packaged with a fully featured free editionspecially designed for developers.



3. Once the download is successful, go to the downloaded folder and look forthe SQLServer2017-SSEI-Dev.exe file. Double click on that file, and you should see Getting things ready, which means everything is going smoothly.

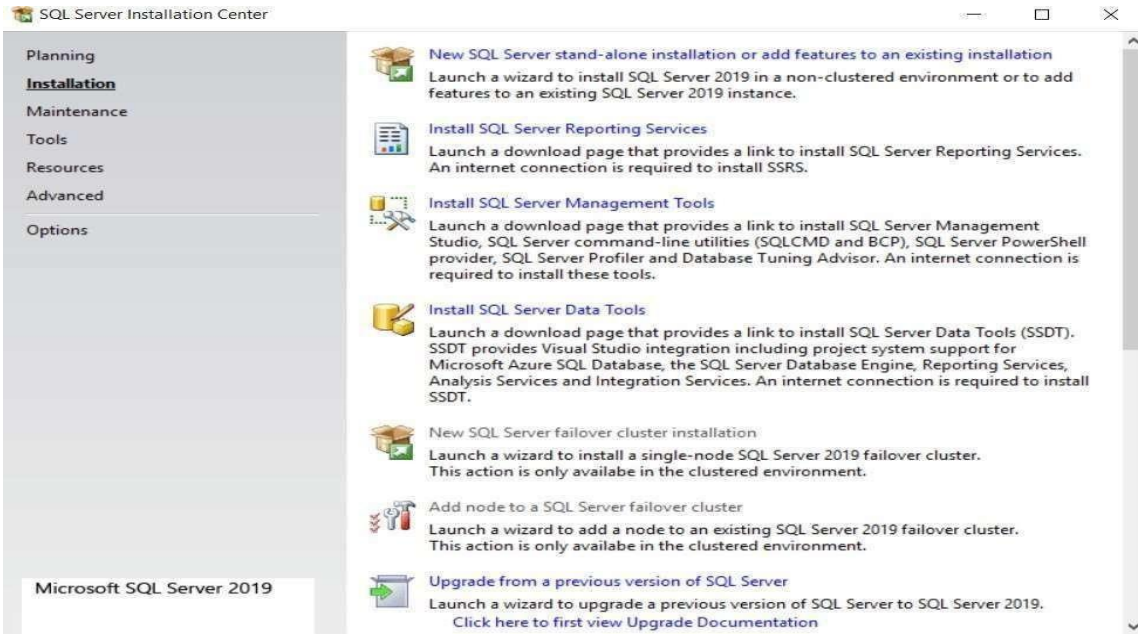
4. After that, it will show you three options Basic, Custom, and Download Media. You needto select the second option, which is Custom.

5. Then you will be asked where you would like your MS SQL installation files to reside, choose accordingly, and click on Install. Make sure you have good internet connectivity.In the meantime, feel free to take a short nap since it will take some time to install.

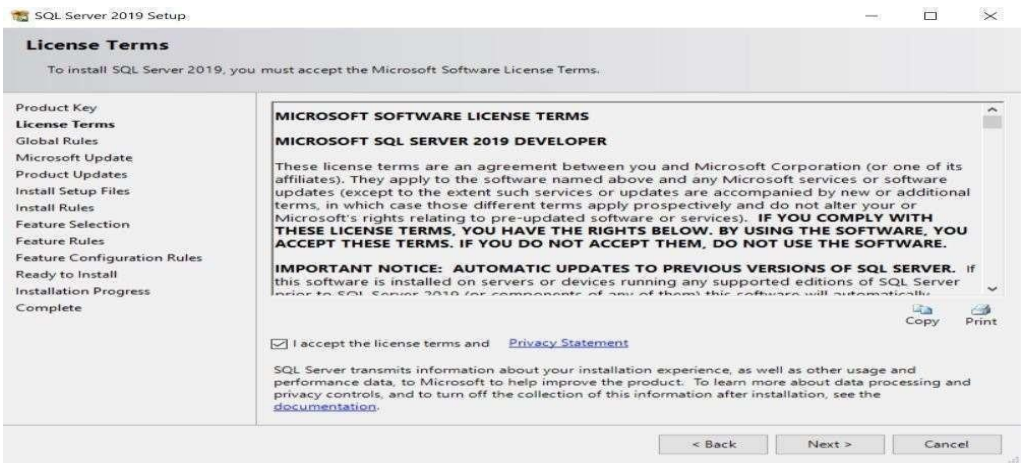


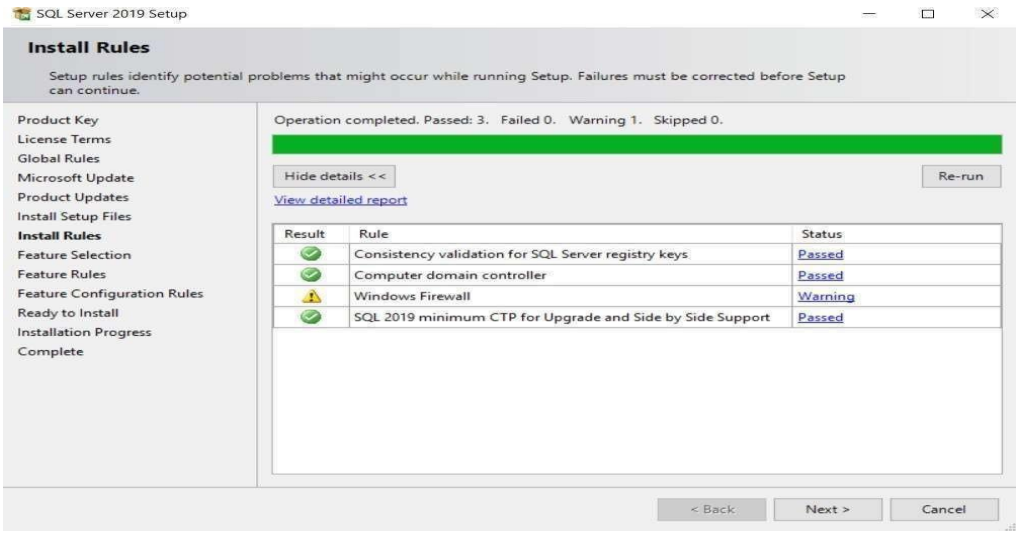
6. Once the download is complete, you shall see download success. It will take you to the next steps that are necessary. A new window with the SQL Server Installation Center will open,

which will have planning, installation, maintenance, etc. You need to click on installation and then on the right side of the panel you will find multiple options, youneed to select New SQL Server stand-alone installation or add features to existing installation.

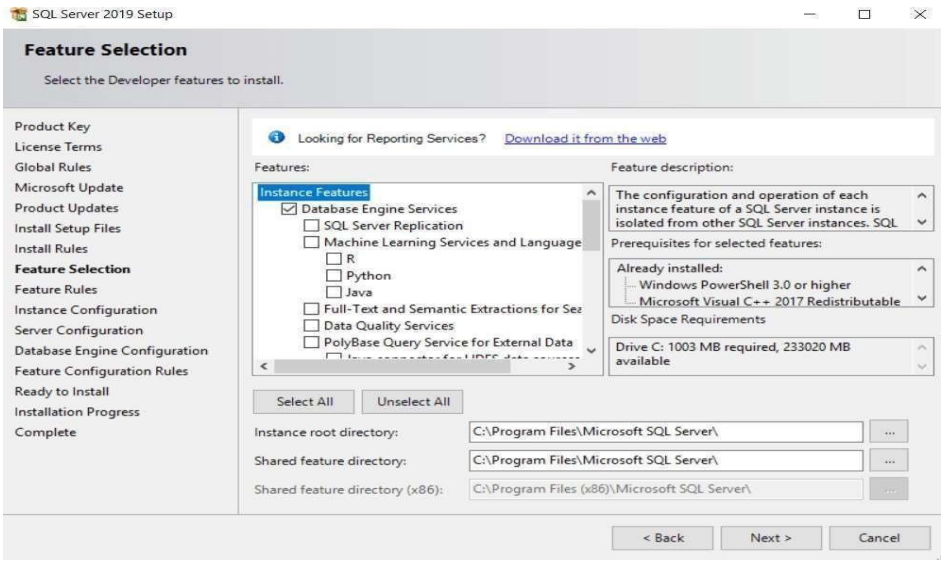


7. Then it will open the SQL Server 2017 setup window in which, by default, the checkboxwith specify a free edition to Developer would be selected. All you need to do is click nextand accept the license terms and again click on next. It will install the setup files and moveto the next step, which is install rules. You might get a warning of windows firewall, which you can safely ignore.

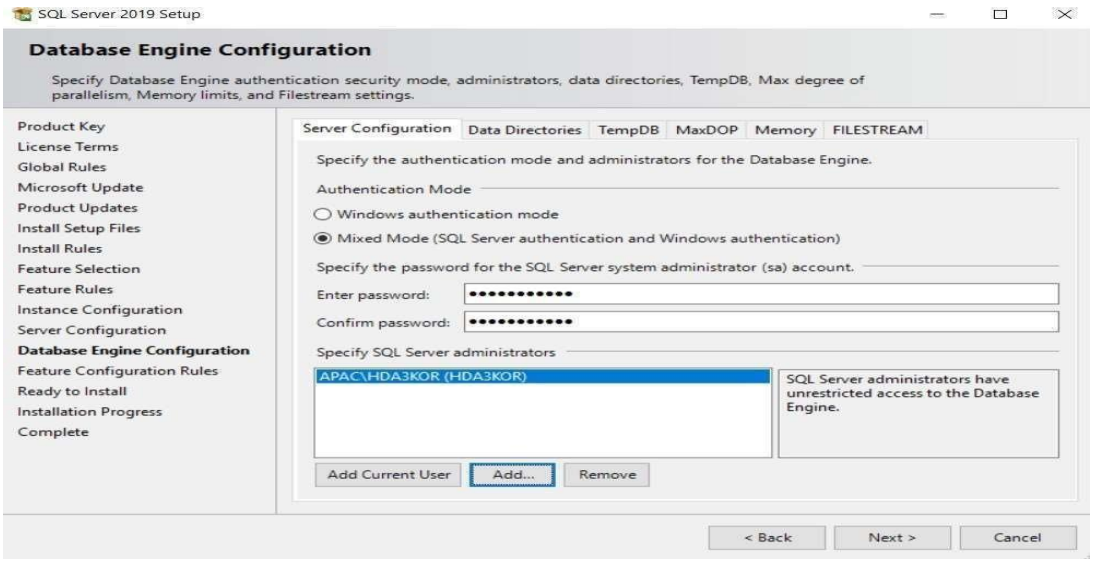




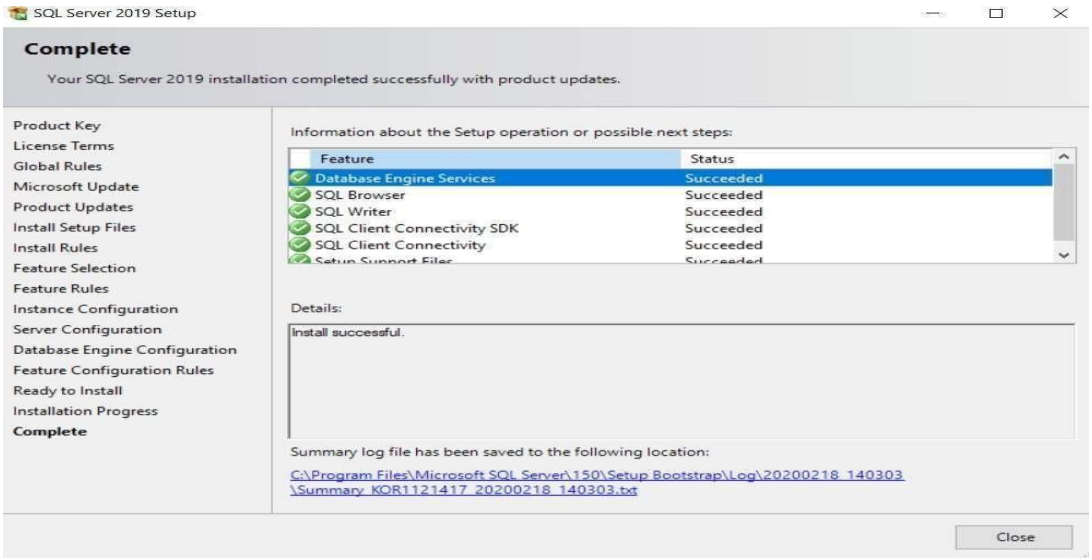
8. Then you will be directed to the Feature Selection setup in which you will find a lot of options to select from, like instance features, database engine services, machine learning services, etc. You need to select the Database engine services and click next.



9. In the instance configuration, specify an instance name that will be later used to connect to the SQL server. Let's name it Datacamp_Sql and click next. You can skip the Server configuration and directly move on to the database engine configuration.



10. Now you will be in the installation progress mode, wait for a while, and let the installationcomplete. Once the installation is complete, you will receive an Installation successful inthe detail box. Feel free to close the SQL server setup window.



- **Result:** By above experiment student learn to install SQL server.

EXPERIMENT 2

- **Aim:**Data types, Creating Tables, Retrieval of Rows using Select Statement, Conditional Retrieval of Rows, Alter and Drop Statements.
- **Data types:**

❖ **Introduction:** Each column in a database table is required to have a name and a data type.An SQL developer must decide what type of data that will be stored inside each column when creating a table. Data types mainly classified into three categories for everydatabase.

❖ **DATA TYPES OF SQL**

1. **CHAR :** This data type is used to store character strings values of fixed length. The size inbrackets determines the number of characters the cell can hold. The maximum number of characters (i.e. the size) this data type can hold is 255 characters. Syntax is CHAR(SIZE) **Example is** CHAR (20)
2. **VARCHAR :** This data type is used to store variable length alphanumeric data. The maximum this data type can hold is 2000 characters. One difference between this data type and the CHAR data type is ORACLE compares VARCHAR values using non-padded comparison semantics i.e. the inserted values will not be padded with spaces. Syntax is VARCHAR(SIZE)
   Example is VARCHAR (20) OR VARCHAR2 (20)
3. **NUMBER :** The NUMBER data type is used to store numbers (fixed or floating point).Numbers of virtually any magnitude maybe stored up to 38 digits of precision. Numbers as large as 9.99 * 10 to the power of 124, i.e. followed by 125 zeros can be stored. The precision, (P), determines the maximum length of the data, whereas the scale, (S), determines the number of places to the right of the decimal. If scale is omitted then the default is zero. If precision is omitted values are stored with their original precision up tothe maximum of 38 digits.
   Syntax is NUMBER (P, S) Example is NUMBER (10, 2)
4. **LONG :**This data type is used to store variable length character strings containing up to2GB. LONG data can be used to store arrays of binary data in ASCII format. LONG values cannot be indexed, and the normal character functions such as SUBSTR cannot be appliedto LONG values.
   Syntax is LONG (SIZE) Example is LONG (20)

5. **DATE :**This data type is used to represent data and time. The standard format id DD-MM- YY as in 13-JUL-85. To enter dates other than the standard format, use the appropriate functions. Date Time stores date in the 24-hour format. By default, the time in a date fieldis 12:00:00 am, if no time portion is specified. The default date for a date field is the firstday of the current month. Syntax is DATE
6. **LONG RAW :** LONG RAW data types are used to store binary data, such as Digitized picture or image. Data loaded into columns of these data types are stored without any further conversion. LONG RAW data type can contain up to 2GB. Values stored in columns having LONG RAW data type cannot be indexed. Syntax is LONGRAW (SIZE)
7. **RAW :** It is used to hold strings of byte oriented data. Data type can have a maximum length of 255 bytes. Syntax is RAW(SIZE**).**

- **Creating Tables:**A table is basic unit of storage. It is composed of rows and columns. Tocreate a table we will name the table and the columns of the table. We follow the rules toname tables and columns:-
  It must begin with a letter and can be up to 30 characters long.
  It must not be duplicate and not any reserved word.

SYNTAX to create a table is

```
CREATE TABLE student (
stu_id NUMBER(7),
  name VARCHAR2(20),
  state  VARCHAR2(15),
  city VARCHAR2(15)
);
```

SYNTAX to insert in a table is

```
INSERT INTO student (stu_id, name, city, state)
VALUES (2337717, 'Nandita', 'Mandi', 'HP');
```

- **Creating table in SQL:**
-

```
| stu_id | name    | city  | state |
+--------+---------+-------+-------+
| 2337717| Nandita | Mandi | HP    |
```

- **Retrieval of Rows using Select Statement:**

SELECTING ALL COLUMNS OF THE TABLE:A 'SELECT' statement is used as a DATA RETRIVAL statement i.e. It retrieves information from the database.

SYNTAX:

SQL> SELECT * FROM TABLE NAME;

SELECT identifies WHAT COLUMNS.

FROM identifies WHICH TABLE.

```
Command:- SQL> SELECT * FROM STUDENT
```

```
stu_id  | name
--------|---------
2337717 | Nandita
```

SELECTING SPECIFIC COLUMNS OF THE TABLE:

SYNTAX:

SQL> SELECT Name, State FROM students;

We can use SELECT statement to display specific columns of the table by specifying the column names separated by commas. As shown above

In SELECT clause We specify the column names, in the order in which we want them to appear as output

.

```
Name     | State
---------+-------
Nandita | HP
```

- **Conditional Retrieval of Rows**:

The WHERE clause is used to extract only those records that fulfill a specified criterion.

SYNTAX

SELECT column_name(s)

FROM table_name

WHERE column_name operator value

With the WHERE clause, the following operators can be used:

Operator	Description
=	Equal
<>	Not equal
>	Greater than
<	Less than
>=	Greater than or equal
<=	Less than or equal
BETWEEN	Between an inclusive range
LIKE	Search for a pattern
IN	If you know the exact value you want to return for at least one of the columns

```
sqlite> SELECT Name, City FROM students
WHERE State = 'HP';
Nandita|Mandi
```

- **Alter:** After creating a table one may have need to change the table either by add newcolumns or by modify existing columns. One can do so by using alter table command. **SYNTAX** ALTER TABLE students MODIFY(State VARCHAR2(20));

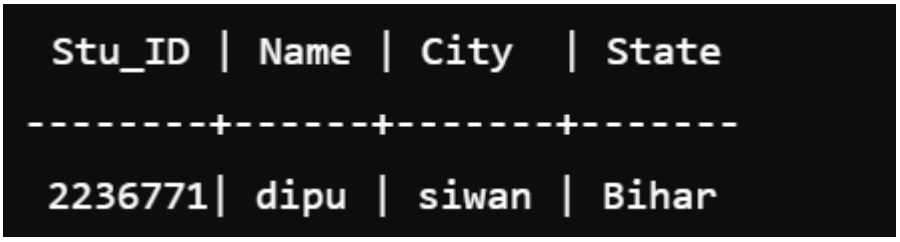
INSERT INTO students (Stu_ID, Name, State, City) VALUES (2236771, dipu', siwan', Bihar');

```
+--------+---------+-------+-------+
| Stu_ID | Name    | City  | State |
+--------+---------+-------+-------+
| 2337717| Nandita | Mandi | HP    |
| 2236771| dipu    | siwan | Bihar |
```

- **DROP TABLE**:The DROP TABLE statement is used to drop an existing table in a database.

SYNTAX :- DROP TABLE students;
DELETE FROM students WHERE Name = Nandita';

DROP TABLE tablename



- **Result:**Through above experiment student about Data types, how to Create Tables, Retrieval of Rows using Select Statement, Conditional Retrieval of Rows, Alter and Drop Statements.