Lab:3

CLO4

Topic:
Constraint, Primary key, Foreign key.

Constraints:

The following constraints are commonly used in SQL:

- NOT NULL - Ensures that a column cannot have a NULL value
- UNIQUE - Ensures that all values in a column are different
- PRIMARY KEY - A combination of a NOT NULL and UNIQUE. Uniquely identifies each row in a table
- FOREIGN KEY - Prevents actions that would destroy links between tables
- CHECK - Ensures that the values in a column satisfies a specific condition
- DEFAULT - Sets a default value for a column if no value is specified

>>CHECK Constraint:

A check constraint in SQL Server (Transact-SQL) allows you to specify a condition on each row in a table**.**

Syntax:

```
CREATE TABLE table_name
(
column1 datatype [ NULL | NOT NULL ],
column2 datatype [ NULL | NOT NULL ]
…
CHECK [ NOT FOR REPLICATION ] (column_name condition)
);
```

Example:

```
CREATE TABLE employees
( employee_id INT NOT NULL,
last_name VARCHAR(50) NOT NULL,
first_name VARCHAR(50),
salary MONEY,
CONSTRAINT check_employee_id
CHECK (employee_id BETWEEN 1 and 10000)
);
```

DML stands for Data Manipulation Language. The SQL statements that are in the DML class are INSERT, UPDATE, DELETE and SELECT. Using DML and above Statements perform the task given.

Create SQL Server PRIMARY KEY: Add to Existing Table

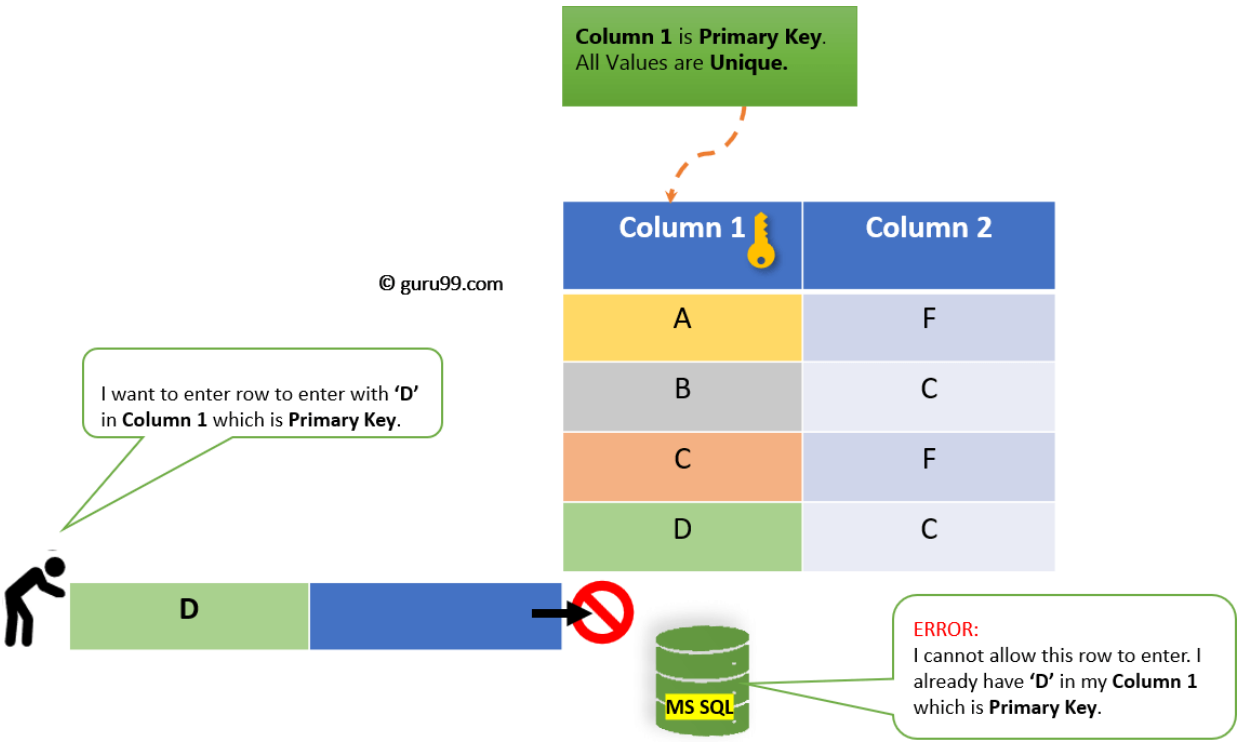
What is a Primary Key?

Primary Key is a field or a combination of fields that identify a record uniquely. The Primary key is a column or set of columns that are unique. In other words, every value is unique for Primary Key.

Rules for Primary Key

- Each table can have only one Primary Key.
- All the values are unique and Primary key value can uniquely identify each row.
- The system will not allow inserting a row with a primary key which already exists in the table.
- Primary Key cannot be NULL.

Below diagram summarizes all the above point for the primary key.



How Primary Key Works

In this section we will learn

- How to Create Primary Key
  - Using SQL Server Management Studio

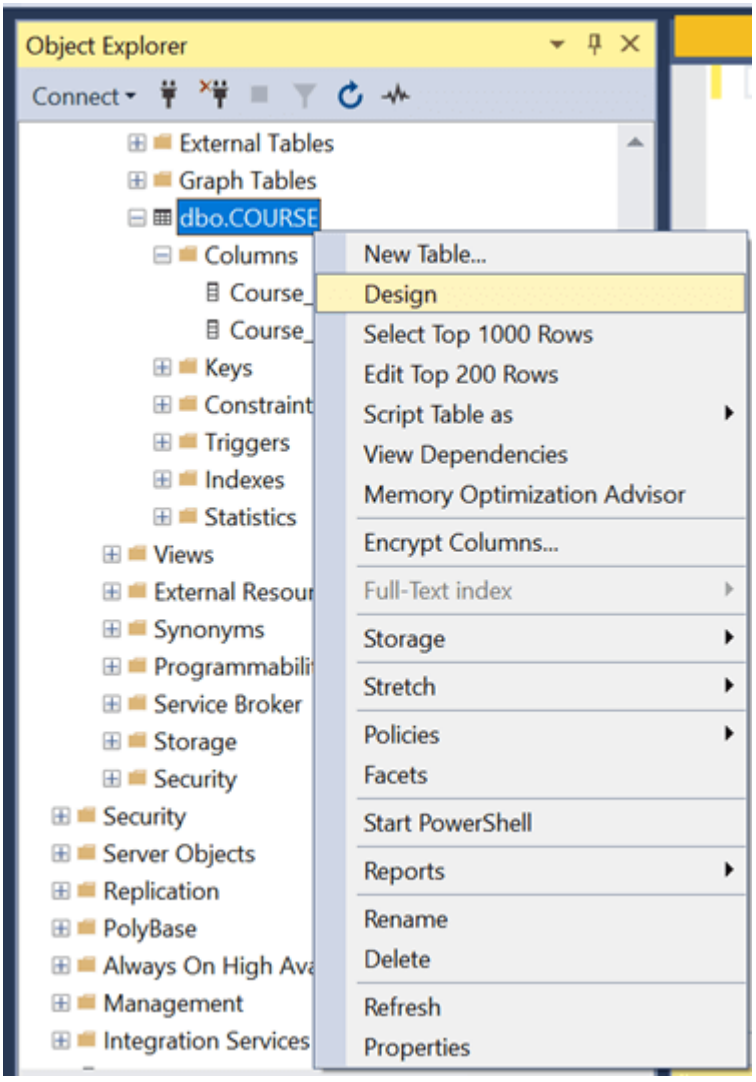
How to Create Primary Key

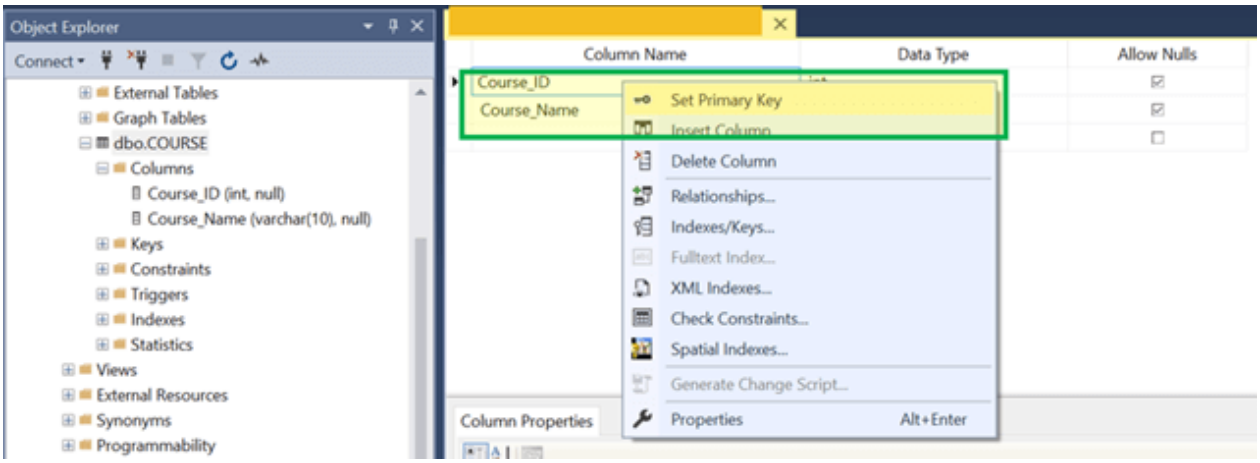
1. SQL Server Management Studio.

SQL Server Management Studio

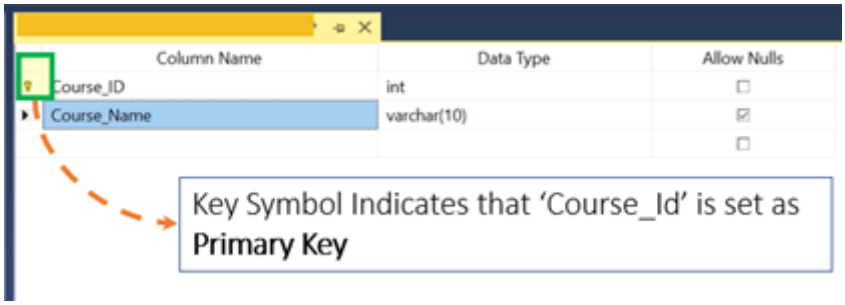
Step 1) Right Click on the Table name. Click on **Design.**

Step 2) Right-click on the Column name. Click on '**Set Primary Key**'





Result: Course_Id is now a **Primary Key.**

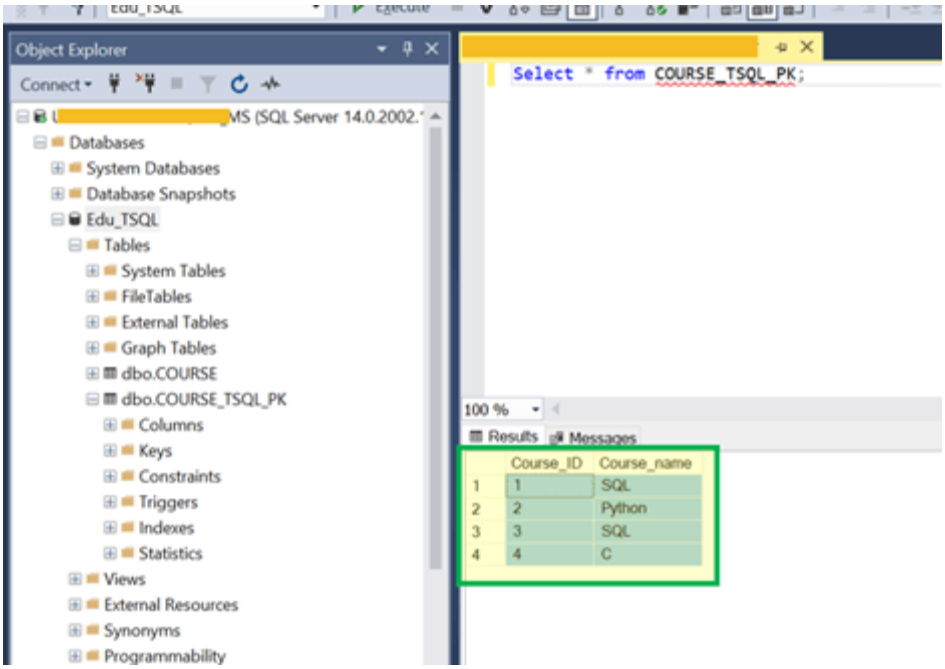


Example: Let's see if it allows entering Multiple Records with Same Course ID.

Step 1) Insert 4 rows with **different Course_ID**

```
Insert into COURSE_TSQL_PK values (1,'SQL');
Insert into COURSE_TSQL_PK values (2,'Python');
Insert into COURSE_TSQL_PK values (3,'SQL');
Insert into COURSE_TSQL_PK values (4,'C');
```

Step 2) Verify all Data Inserted successfully by running the Select query.

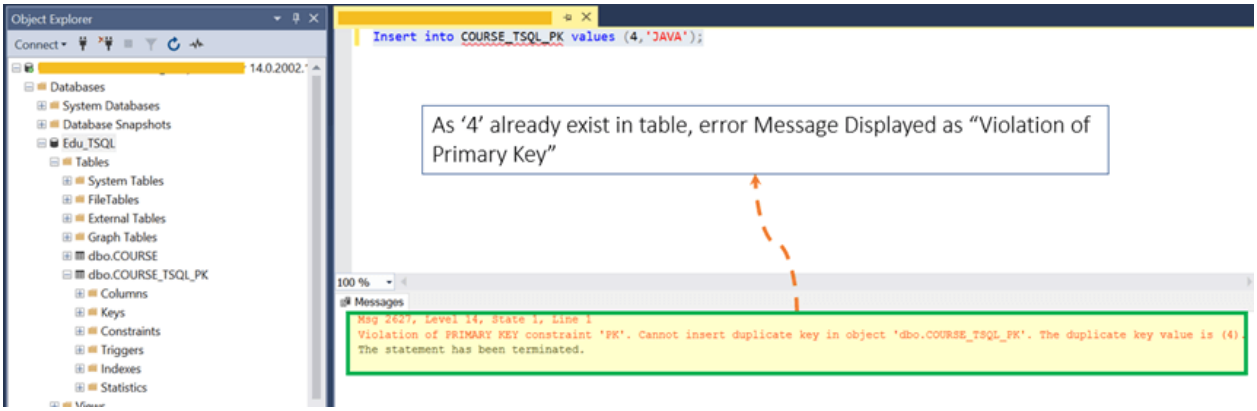


Note: We can insert duplicate values in the Non-Primary key.

Step 3) Now let's try Inserting New records with an existing Course_ID which is Primary Key.

```
Insert into COURSE_TSQL_PK values (4,'JAVA');
```

Result: System does not allow inserting new value as 4 is there Course_ID column which is a Primary Key.



You can use the ALTER statement to create a primary key. However, the primary key can only be created on columns that are defined as NOT NULL. You cannot create a primary key on a column that allows NULLs. If you need to do, you have to drop and recreate the table.

Interesting Facts!

- The Primary key can be a combination of multiple columns. This combination is known as the **Composite primary key**.
- The Primary key can have a maximum of 16 columns.

Summary

- Each Table can have only one Primary Key
- All the values are unique which can **uniquely identify each row.**

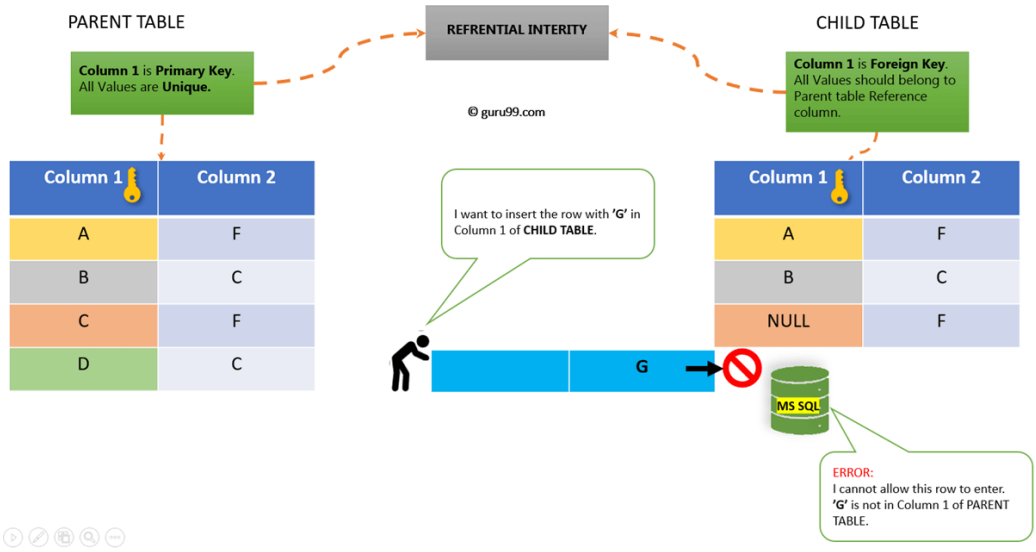
What is a Foreign Key?

A **FOREIGN KEY** provides a way of enforcing referential integrity within SQL Server. In simple words, foreign key ensures values in one table must be present in another table.

Rules for Foreign key

- NULL is allowed in Foreign key.
- The table being referenced is called the Parent Table
- The table with the foreign key is called Child Table.
- The foreign key in child table references the primary key in the parent table.
- This parent-child relationship enforces the rule which is known as "Referential Integrity."

Below diagram summarizes all the above point for the Foreign key.



How Foreign Key Works

In this section, we will learn

- How to Create Foreign Key
  - Using SQL Server Management Studio
  - Example Query Foreign Key

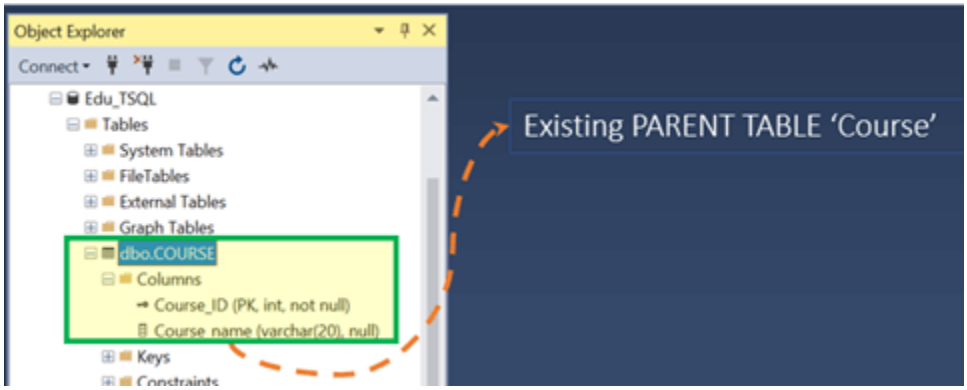
How to Create Foreign Key

We can Create a **Foreign Key** in **2 ways:**

1. SQL Server Management Studio

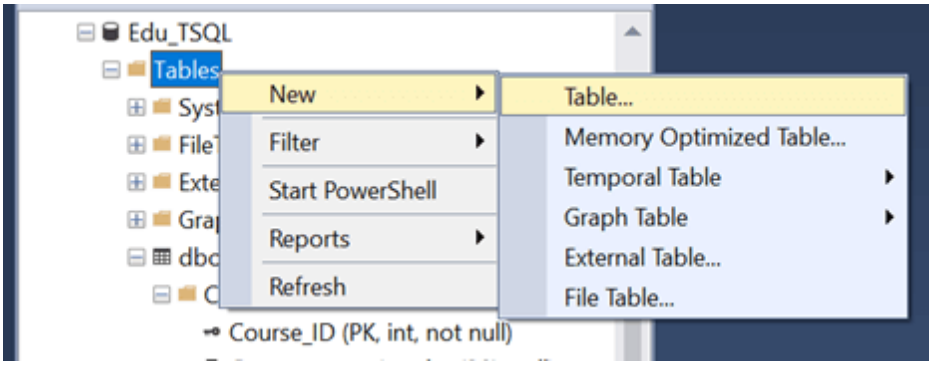
SQL Server Management Studio

Parent Table: Say, we have an existing Parent table as 'Course.' Course_ID and Course_name are two columns with Course_Id as Primary Key.

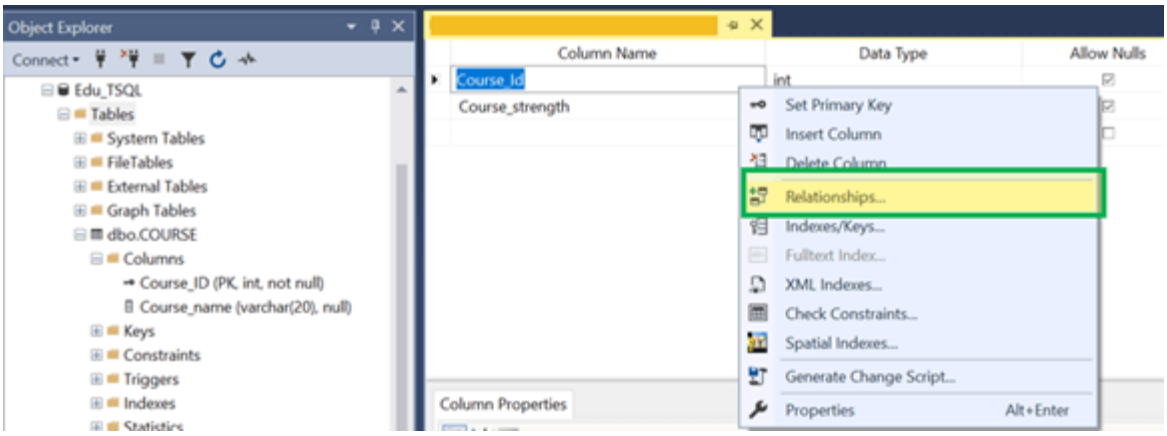


Child Table: We need to create the second table as a child table. 'Course_ID' and 'Course_Strength' as two columns. However, 'Course_ID' shall be Foreign Key.

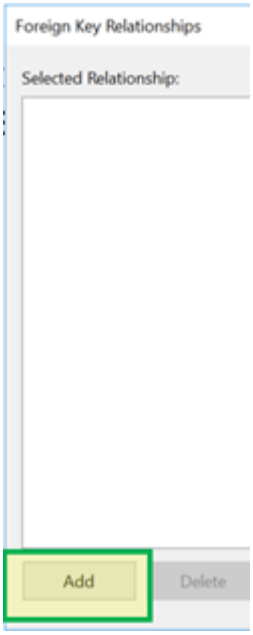
Step 1) Right Click on Tables>New> Table…



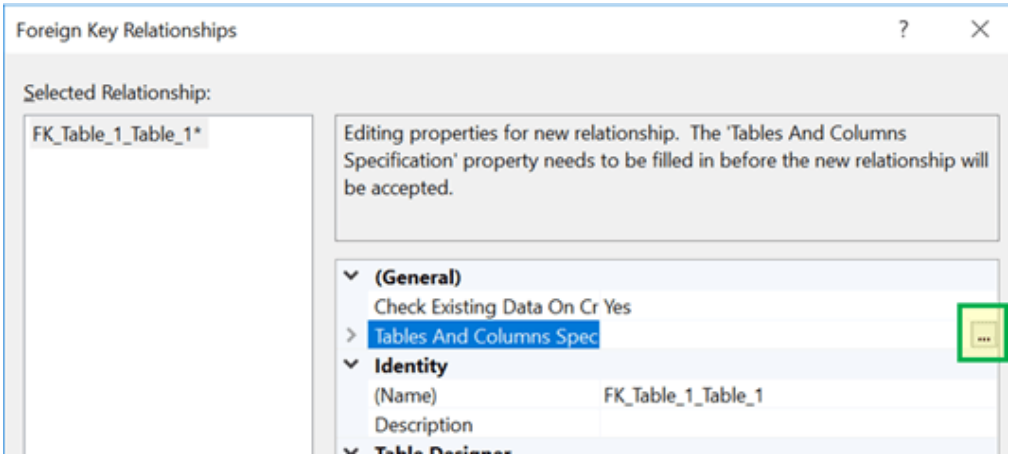
Step 2) Enter two column name as 'Course_ID' and 'Course_Strength.' Right click on 'Course_Id' Column. Now click on Relationship.



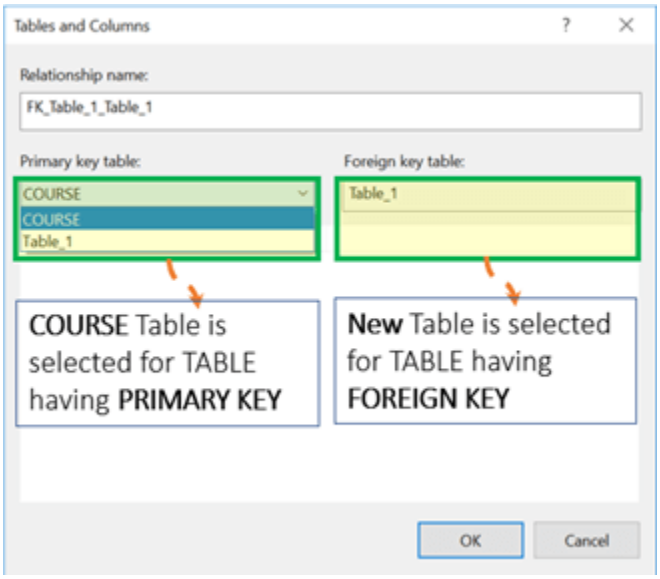
Step 3) In '**Foreign Key Relationship**,' Click '**Add**'



Step 4) In 'Table and Column Spec' click on **'…' icon**

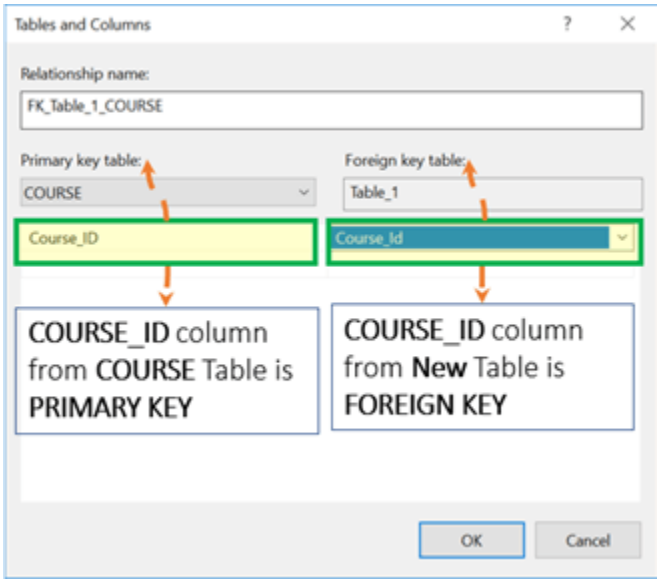


Step 5) Select 'Primary Key Table' as 'COURSE' and the new table now being created as 'Foreign Key Table' from the drop down.

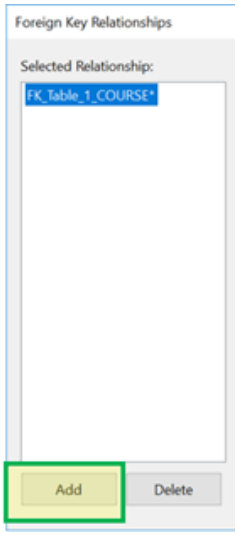


Step 6) 'Primary Key Table' - Select 'Course_Id' column as 'Primary Key table' column.

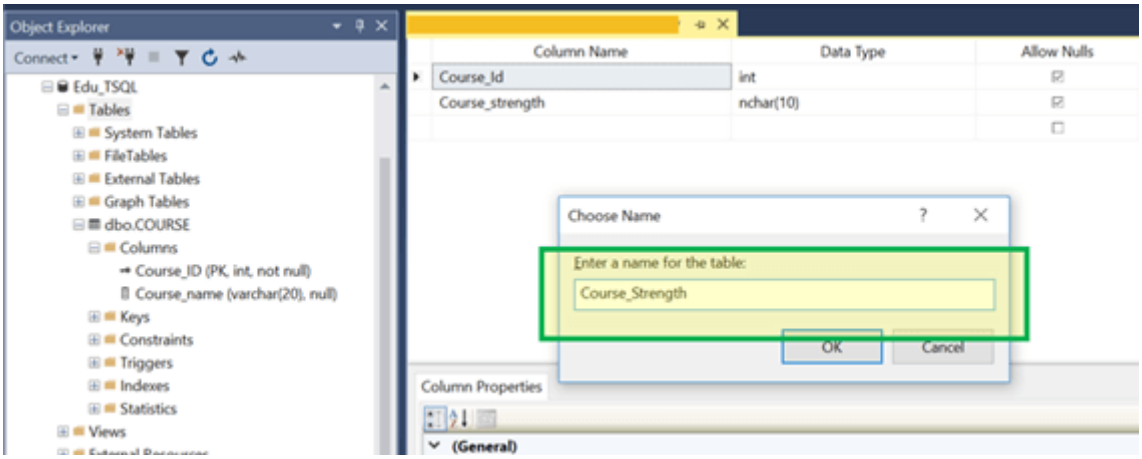
'Foreign Key Table'- Select 'Course_Id' column as 'Foreign Key table' column. Click OK.



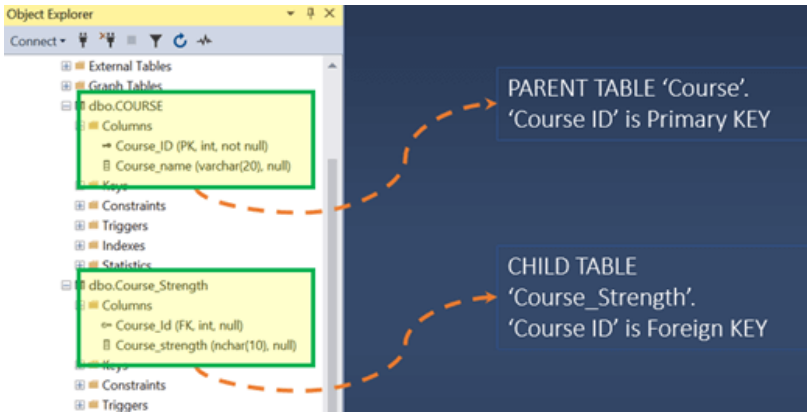
Step 7) Click on **Add.**



Step 8) Give the Table name as 'Course_Strength' and click on **OK.**

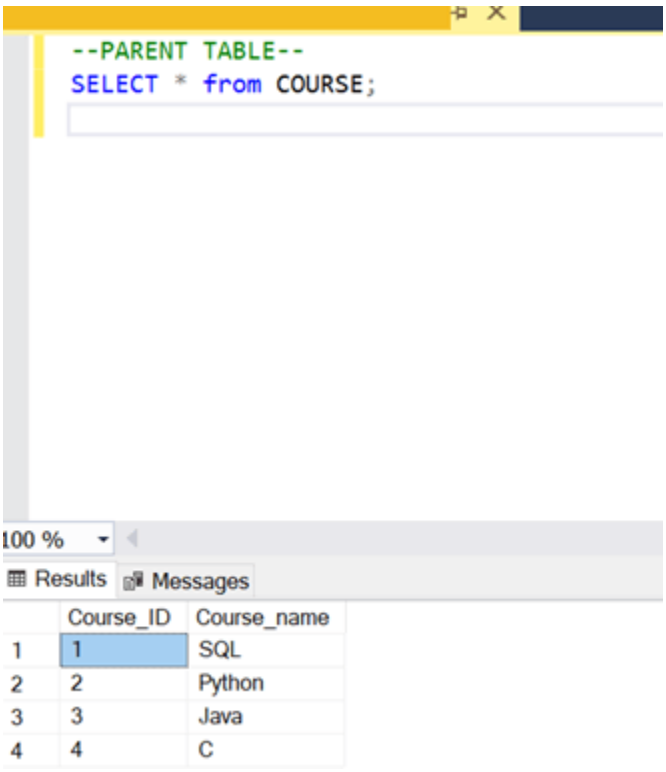


Result: We have set Parent-child relationship between **'Course'** and **'Course_strength.'.**



Query:

```
SELECT * from COURSE;
```



	Course_ID	Course_name
1	1	SQL
2	2	Python
3	3	Java
4	4	C

Summary:

- Every value of Foreign key has to be part of Primary Key of other tables.
- The Foreign key can reference to another column in the same table. This reference is known as a self-reference.
- You can create a Foreign Key using Create Table, Alter Table, or SQL Server Management Studio.

Tasks:

Q1. Create a table **Patient** with following fields

- PatientID varchar (15)
- Name varchar (15)
- Age int
- Gender varchar(5)
- Address varchar(20)
- Disease varchar(10)
- DoctorID varchar(15)

Constraints.

- **PatientID** in Patient, is primary key.

Q2. Change the datatype of Gender from varchar(5) to char in **Patient** table.

Q3. Create a table **Doctor** with following fields

- DoctorID varchar (15)
- Name varchar (15)
- Age int
- Gender char
- Address varchar(20)

Constraints.

- **DoctorID** in Doctor, is primary key.

Q4. Now add column **DoctorWard varchar(15)** in Doctor table.