

# **Database Systems**

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**Structured Query Language “SQL”**

# Outline

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- Structured Query Language “SQL” Select
- Data Definition Language “DDL” (Create Alter Drop).
- Data Definition Language “DML” (Insert Update Delete).

# Data Definition Language “DDL”, Create

## Data types:

- Numeric(7)
- Numeric (5,3)) 99.999
- Date
- Varchar
- Char
- image

```
Create table stud ( S_ID numeric (7) ,  
                  S_name nvarchar(40),  
                  Gender char (4),  
                  B_date Date,  
                  Imag image,  
                  GPA Numeric(5,3));
```

	Column Name	Data Type	Allow Nulls
►	S_ID	numeric(7, 0)	<input checked="" type="checkbox"/>
	S_name	nvarchar(40)	<input checked="" type="checkbox"/>
	ender	char(4)	<input checked="" type="checkbox"/>
	B_date	date	<input checked="" type="checkbox"/>
	Imag	image	<input checked="" type="checkbox"/>
	GPA	numeric(5, 3)	<input checked="" type="checkbox"/>
			<input type="checkbox"/>

# Constraints

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- 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.
- Create Index: Used to create and retrieve data from the database very quickly.

# Data Definition Language “DDL” ,Create

## Create Table

```
Create table Mydb1.dbo.stud
(
S_ID numeric (7) primary
key,
S_name nvarchar(40) NOT
NULL,
Gender char (4),
B_date Date,
Imag image,
email varchar(20) unique,
GPA Numeric(5,3),
Constraint gpa_check check
(gpa between 0 and 5));
```

	Column Name	Data Type	Allow Nulls
🔑	S_ID	numeric(7, 0)	<input type="checkbox"/>
	S_name	nvarchar(40)	<input type="checkbox"/>
	Gender	char(4)	<input checked="" type="checkbox"/>
	B_date	date	<input checked="" type="checkbox"/>
	Imag	image	<input checked="" type="checkbox"/>
	email	varchar(20)	<input checked="" type="checkbox"/>
	GPA	numeric(5, 3)	<input checked="" type="checkbox"/>
			<input type="checkbox"/>

## Delete Table

```
Drop table Mydb1.dbo.stud;
```

**Foreign Key** should be Primary key or unique

# Data Definition Language “DDL”, Create

## Create Table

```
Create table Mydb1.dbo.stud
(
  S_ID numeric (7) primary
  key,
  S_name nvarchar(40) NOT
  NULL,
  Gender char (4),
  B_date Date,
  Imag image,
  email varchar(20) unique,
  GPA Numeric(5,3),
  Constraint gpa_check check
  (gpa between 0 and 5));
```


	Column Name	Data Type	Allow Nulls
▶🔑	S_ID	numeric(7, 0)	<input type="checkbox"/>
	S_name	nvarchar(40)	<input type="checkbox"/>
	Gender	char(4)	<input checked="" type="checkbox"/>
	B_date	date	<input checked="" type="checkbox"/>
	Imag	image	<input checked="" type="checkbox"/>
	email	varchar(20)	<input checked="" type="checkbox"/>
	GPA	numeric(5, 3)	<input checked="" type="checkbox"/>
			<input type="checkbox"/>

**Foreign Key** should be Primary key or unique  
S\_ID, email

# Data Definition Language “DDL”, Alter

## Alter Table

Alter table  
Mydb1.dbo.stud add  
tel varchar(15)



	Column Name	Data Type	Allow Nulls
	S_ID	numeric(7, 0)	<input type="checkbox"/>
	S_name	nvarchar(40)	<input type="checkbox"/>
	Gender	char(4)	<input checked="" type="checkbox"/>
	B_date	date	<input checked="" type="checkbox"/>
	Imag	image	<input checked="" type="checkbox"/>
	email	varchar(20)	<input checked="" type="checkbox"/>
	GPA	numeric(5, 3)	<input checked="" type="checkbox"/>
	tel	varchar(15)	<input checked="" type="checkbox"/>
			<input type="checkbox"/>

# Foreign Key

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```
Create table Mydb1.dbo.Enroll ( SID numeric (7),  
    c_code varchar(30), Grade numeric,  
constraint E_PK primary key (c_code,SID));
```

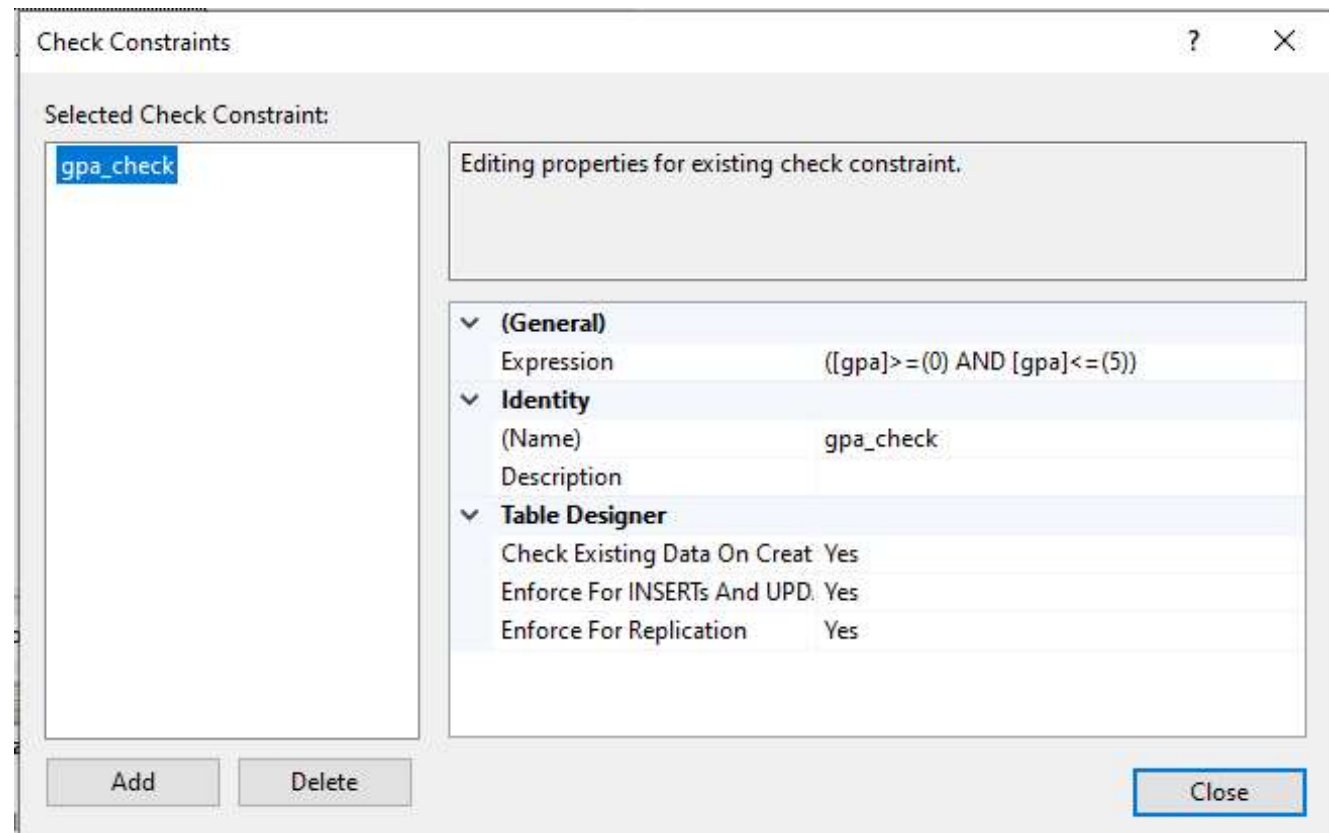
```
Alter Table Mydb1.dbo.Enroll  
ADD constraint SFK foreign key (S_ID) references  
mydb1.dbo.stud(S_ID) ;
```

	Column Name	Data Type	Allow Nulls
	SID	numeric(7, 0)	<input type="checkbox"/>
	c_code	varchar(30)	<input type="checkbox"/>
	Grade	numeric(18, 0)	<input checked="" type="checkbox"/>
			<input type="checkbox"/>



# Enable check Constraint

Alter Table Mydb1.dbo.stud check constraint  
gpa\_check;



# Disable check Constraint

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```
Alter Table  Mydb1.dbo.stud nocheck constraint  
gpa_check;
```

# Data Manipulation Language (DML), insert

```
insert into mydb1.dbo.stud (S_ID,S_Name) values (3,  
'Omer');
```

S_ID	S_name	Gender	B_date	email	GPA	tel
1	Ahmed	male	2001-08-01	Ahmed@yahoo...	NULL	NULL
2	Ali	Male	2001-01-01	Ali@yahoo.com	NULL	NULL
3	Omer	NULL	NULL	NULL	NULL	NULL
NULL	NULL	NULL	NULL	NULL	NULL	NULL

# Data Manipulation Language (DML), update

```
update mydb1.dbo.stud
set Gender = 'Male', B_date= '2001-08-01', email =
'Omer@hotmail.com'
where s_name='Omer';
```

S_ID	S_name	Gender	B_date	email	GPA	tel
1	Ahmed	male	2001-08-01	Ahmed@yahoo...	NULL	NULL
2	Ali	Male	2001-01-01	Ali@yahoo.com	NULL	NULL
3	Omer	Male	2001-08-01	Omer@hotmail...	NULL	NULL
NULL	NULL	NULL	NULL	NULL	NULL	NULL

# Data Manipulation Language (DML), delete

```
delete from mydb1.dbo.stud where s_ID=1;
```

```
Select *  
from MyDB1.dbo.Stud;
```

S_ID	S_name	Gender	B_date	email	GPA	tel
2	Ali	Male	2001-01-01	Ali@yahoo.com	NULL	NULL
3	Omer	Male	2001-08-01	Omer@hotmail...	NULL	NULL
NULL	NULL	NULL	NULL	NULL	NULL	NULL

## Data Control Language “DCL” , grant

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- `grant Select, update, delete on mydb1.dbo.stud to ali;`

Commands completed successfully.

## Data Control Language “DCL” revoke

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- `revoke Select on mydb1.dbo.stud from ali;`

Commands completed successfully.