# SQL Server (t-sql)

This Course will give In-depth Information related to t-sql language

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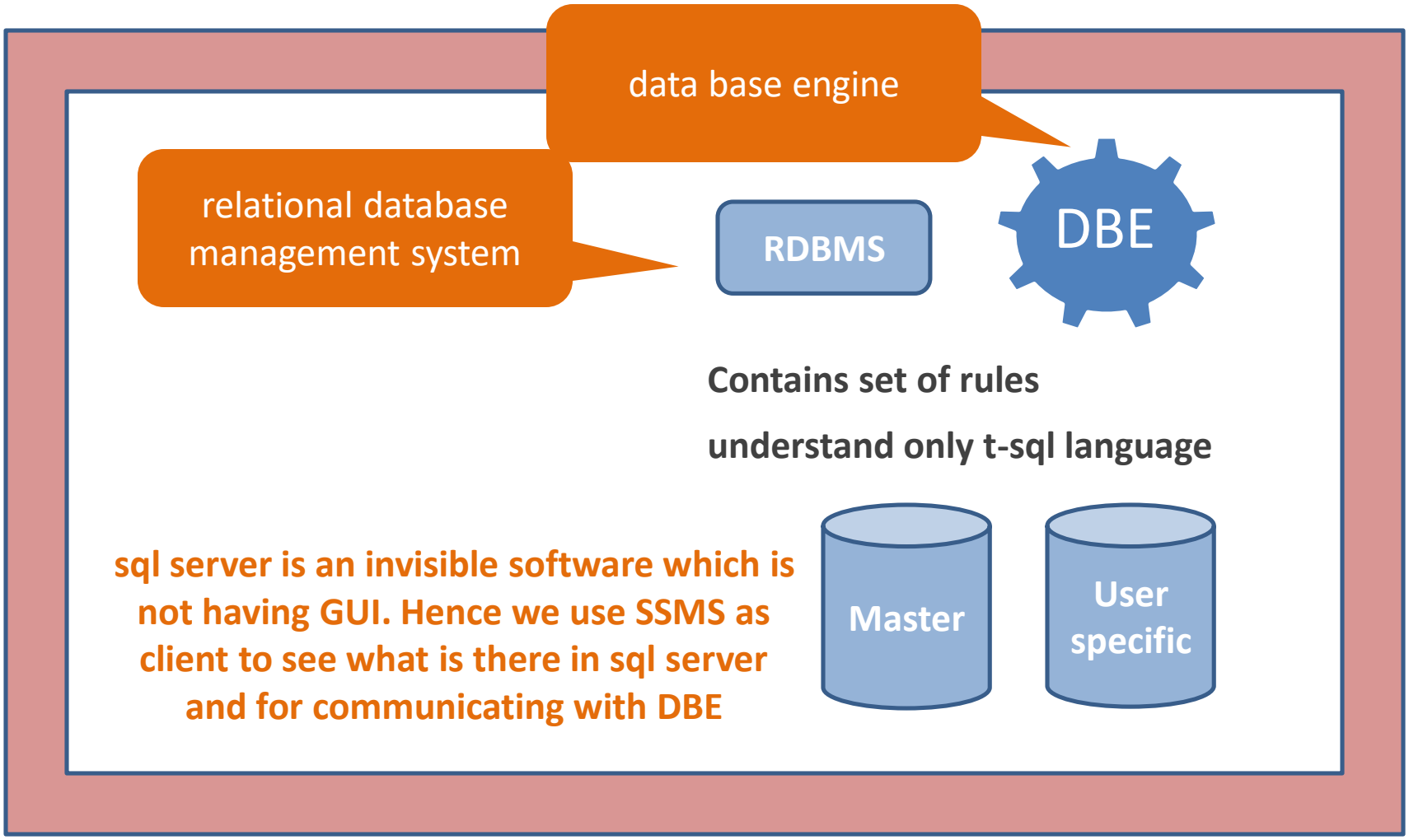
# sql server overview

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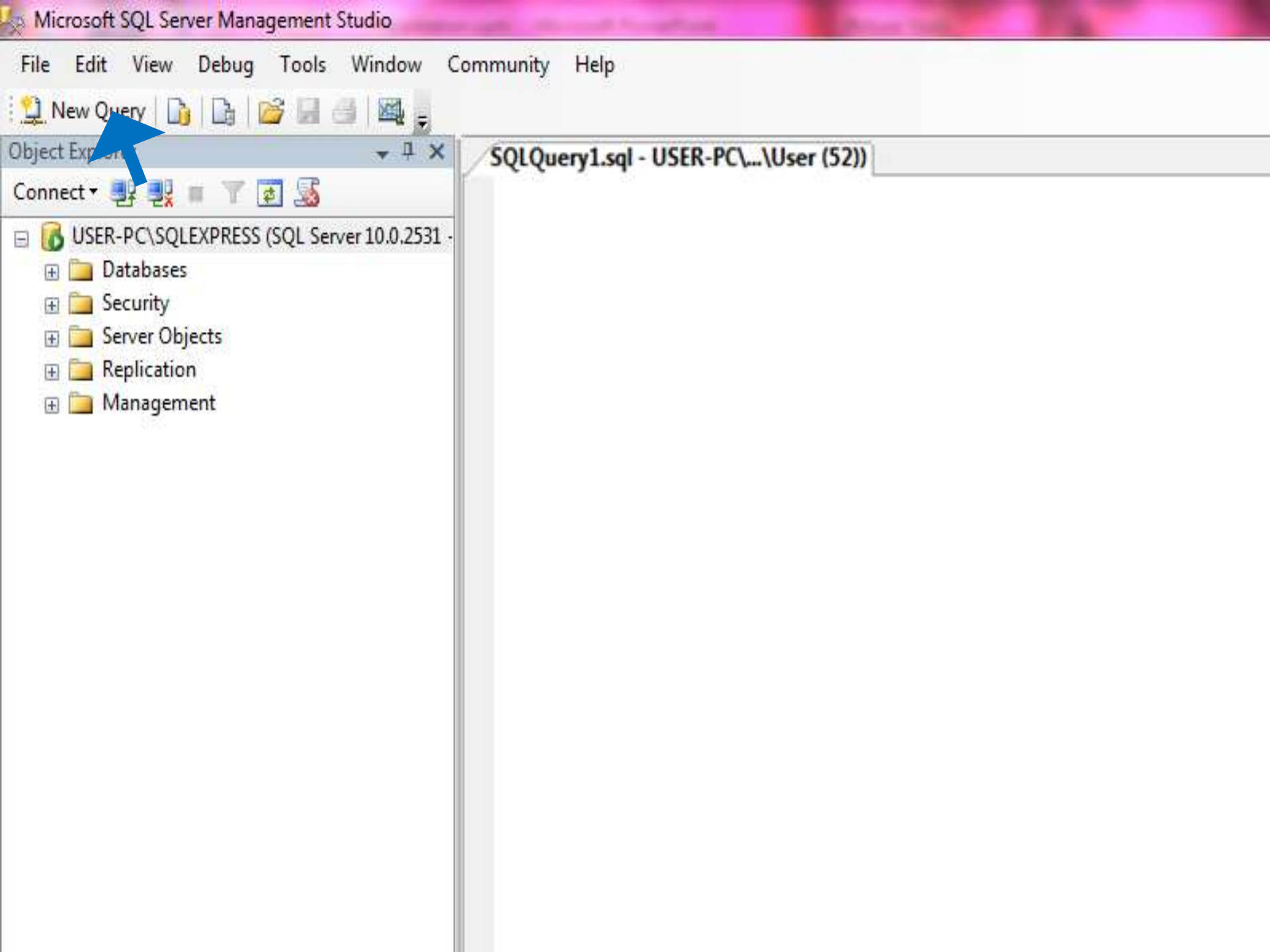
Microsoft SQL Server Management Studio
File
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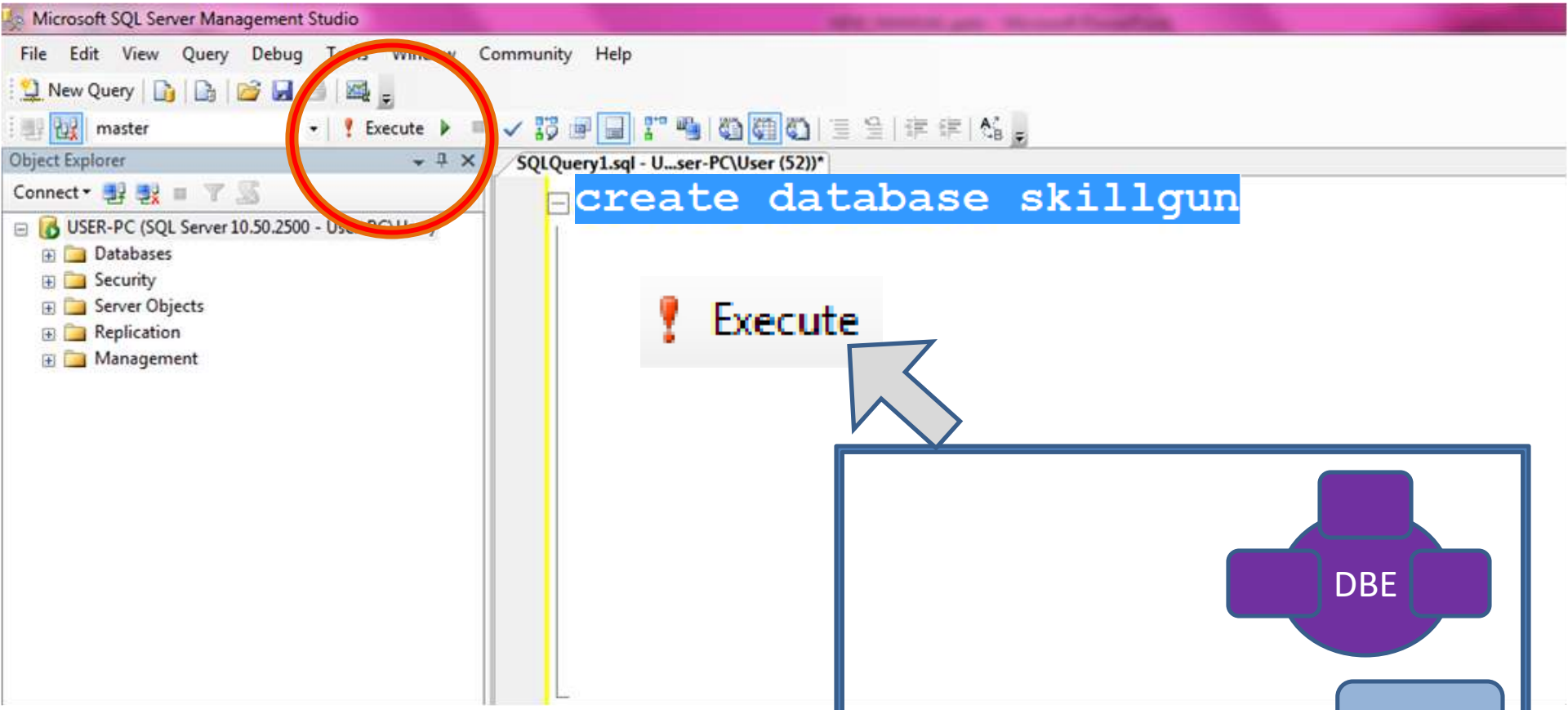
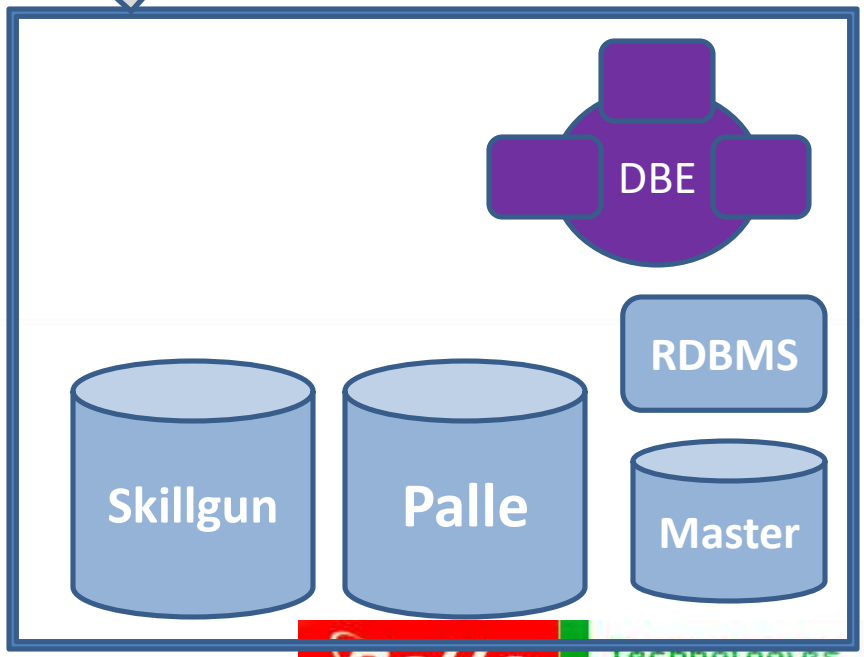
# Creating a Data base







Command(s) Successful

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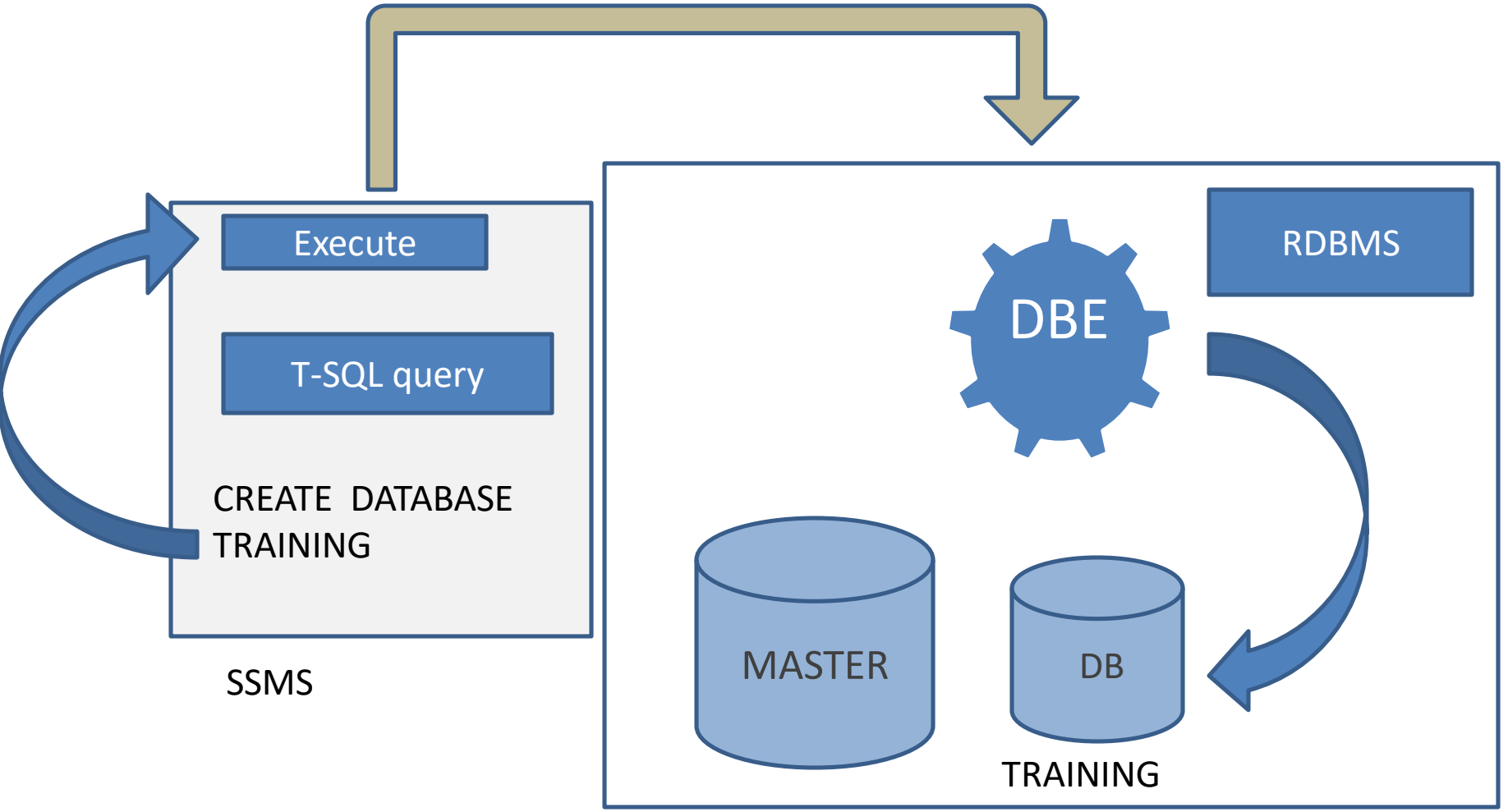
# SSMS and SQL Server Communication

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# Data types in T-SQL

- Int
- Small int
- Bigint
- Tinyint
- Decimal
- Char
- Nchar
- Varchar
- Nvarchar
- Varchar(max)
- Binary
- Varbinary(max)
- Datetime
- Date
- Time
- Smalldatetime
- datetime2
- Money
- Smallmoney
- bit
- Timestamp
- Table
- Real
- Numeric
- Sql_variant
- xml

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| Datatypes | Size in bytes |
| --- | --- |
| • Tinyint<br>• Smallint<br>• Int<br>• Bigint<br>• decimal | 1 byte<br>2 bytes<br>4 bytes<br>8 bytes<br>Can store upto 38 digits all can be after decimal point |
| • Char<br>• Varchar<br>• Varchar(max)<br>• Bit | Can store max 8000 characters<br>Can store upto 8000 characters<br>Can store upto 2^31 characters<br>1 bit ( can store either 0 or1)<br>Note: usually used to store true or false |

# Difference b\w char and nchar

## Char

- we can store up to 8000 chars (can be English + special+ numeric )

## Nchar

- can store up to 8000 characters
- we are allowed to store **(Globalized character+ English + special+ numbers)**

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# difference b\w char and varchar datatypes

**char**

- Fixed size datatype
- declare @c char(10);
  Set @c = 'ABC'

**varchar**

- Varying size datatype
- declare @v varchar(10);
  Set @v = 'ABC';

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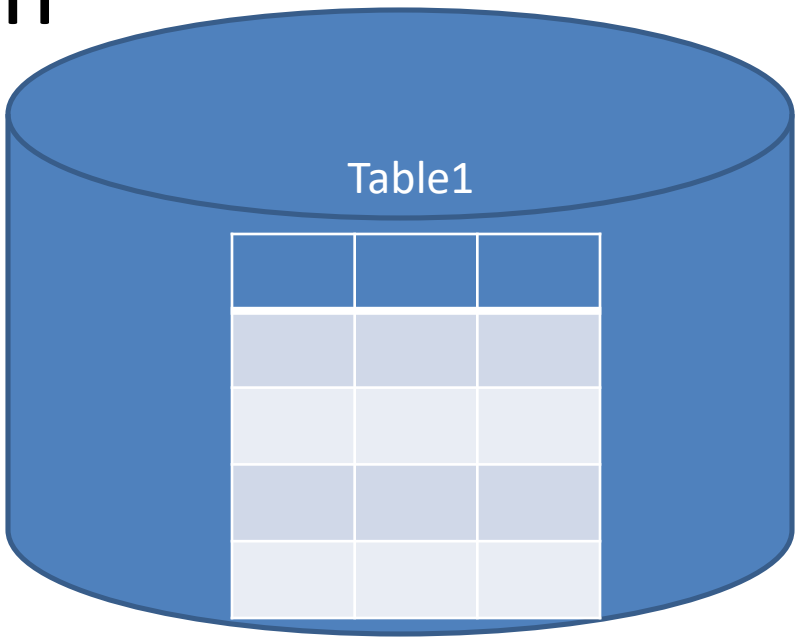
# Table

- Tables are the combination of Rows and Columns

Table = Row+Column

- Rows = tuples
- Columns = Attributes

  or properties

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# Table creation syntax

**Create table** <table_name>

(

Column1 datatype1[(Size)],

Column2 datatype2,

Column3 datatype3,

……..

)

Note: As per industry standards table names and column names must not be plurals.

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# table creation sample

Req:create a student table to store students details sid,name,class,dob

| Int | vc(40) | vc(40) | date |
|---|---|---|---|
| **sid** | **name** | **class** | **dob** |
| | | | |
| | | | |
| | | | |

**student**

```
create table student(
sid int,
name varchar(40),
class varchar(40),
dob date
)
```

```
insert into student values(1,'Rajeev','9th class','10-4-1999');
insert into student values(2,'Veena','10th class','11-5-1998');
```

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# table creation assignment

- write code for implementing the following set of items?
- create a table with the name products and with column names (**pid**→int, **pname**→varchar(40),**cost**→int, **manifacturer_name**→varchar(40), **manifactured_date**→date)
- the table must be created in PalleTraining DB (assuming that the DB is already available in your sql server).
- insert the following data into products table.

  1, lux, 34, HUL, dec-12-2017

  2, locks, 1200, Godrej, Jan-11-2018
- write query for displaying data present in product table

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# constraints Part1

- using constraints we can limit the data which is coming into table columns.
- t-sql supports following constraints

| | | |
|---|---|---|
| not null | default | check |
| primary key | unique | foreign key |

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# Default Constraints

Default constraints are useful for inserting default values when user does not supply any value

**Create table student**
**(**
**Sid int,**
**Name varchar(40),**
**City varchar(40) default 'banglore'**
**)**

**Default** banglore

| Sid | Name | City |
|---|---|---|
| 101 | Raj | chennai |
| 103 | Veena | Bangalore |

```
insert into student values(101,'Raj','chennai')
```

```
insert into student(sid,Name) values(103,'veena')
```

DBE
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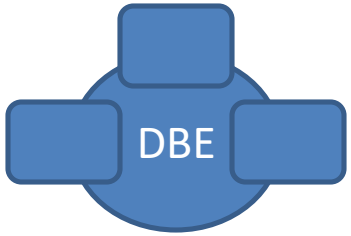
# NotNull Constraints

When you set the not null constraint to a specific column , that column will not allow null value

```
create table employee
(
  Eid int  not null,
  Name varchar(40),
  Email varchar(40)
)
```

NOT NULL

| Eid | Name | Email |
|---|---|---|
| 1 | ravi | r@gmail.com |
| 2 | NULL | NULL |




```
insert into employee values (1,'ravi','r@gmail.com')
insert into employee values (2,null,null)
insert into employee values (null,'suresh','s@gmail.com')
```

Not null constraint will not allow null values.

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# Check Constraints

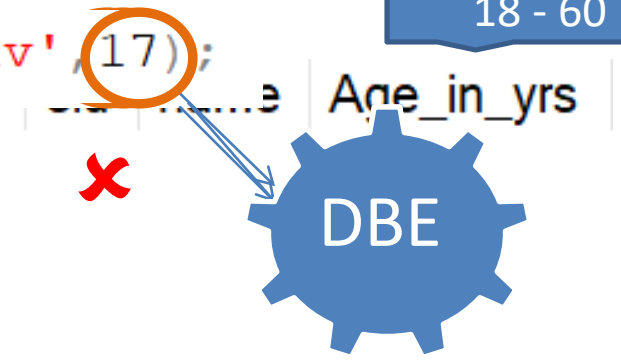
By using check constraints we can limit the Range of permissible values into specific column

**Req:Create a table with employee details eid,Name,Age_in_years(Age must be between 18 to 60)**

```
create table employee(
eid int,
name varchar(40),
Age_in_yrs int check(Age_in_yrs between 18 and 60)
)
insert into employee values(103,'Madhav',17);
```

Do You think that DBE will accept this command?

18 - 60



DBE will not Accept this Command

| eid | name | Age_in_yrs |
|---|---|---|
| 101 | Raj | 25 |

Whether DBE will accept this values?

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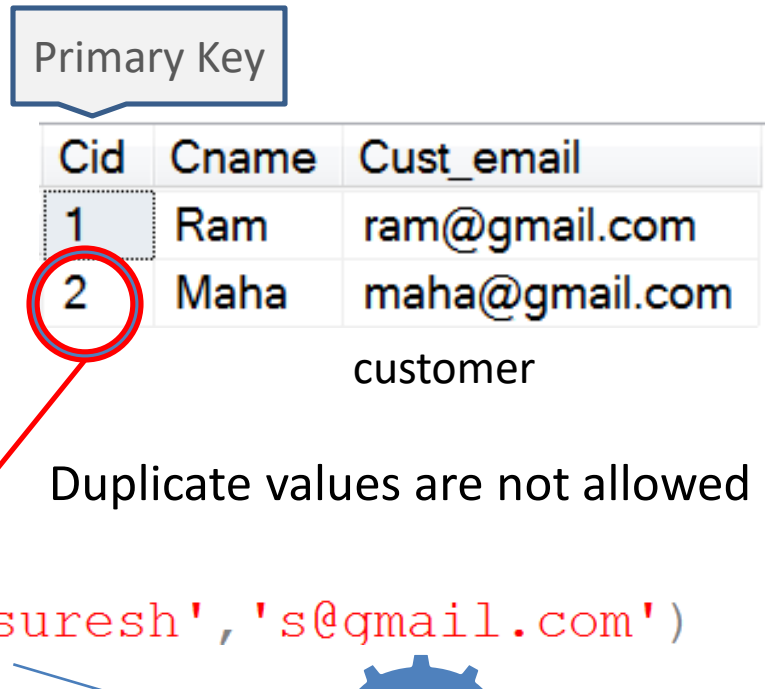
# Primary Key

- primary key gives uniqueness to the tables rows
- only one primary key is allowed per table
- primary key will not allow null values and duplicate values

Lets see a sample

```
create table customer
(
  Cid int primary key,
  Cname varchar(40),
  Cust_email varchar(50)
)

insert into customer values (2,'suresh','s@gmail.com')
```

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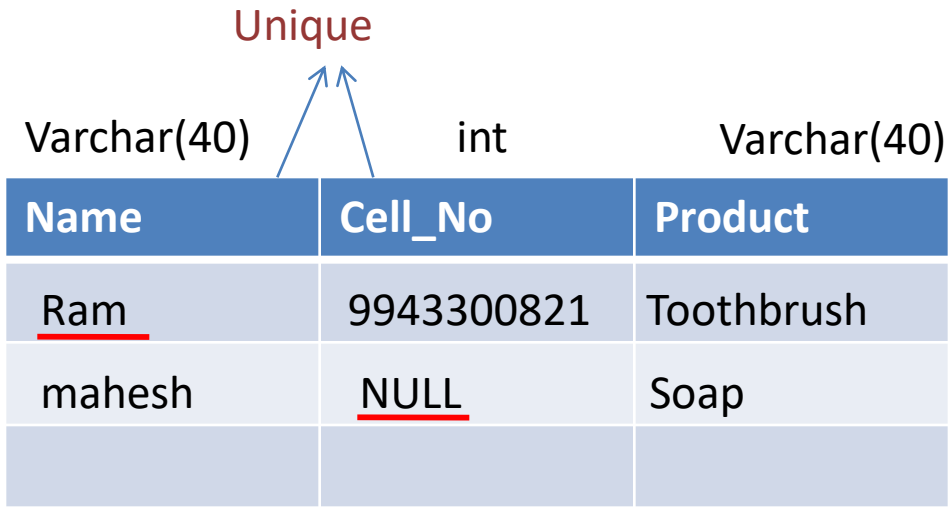
# unique

- unique constraint gives uniqueness to the tables rows
- any number of unique constraints are allowed per table
- unique contraint will not allow duplicate values and allows only one null value

```
create table customer
(
Name varchar(40) unique,
Cell_No int unique,
Product varchar(40)
)
```




CUSTOMER

```
insert into customer values ('Ram',9865226020,'shampoo')
insert into customer values('mahi',null,'lux');
```

ERROR

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# Composite primary key

When we apply primary key constraint on more than one column, then it is called Composite primary key.

```
Create table customer
(
Name  varchar(40),
Dob date,
Product varchar(40),
Constraint  cpk
primary key(Name ,Dob)
)
```

primary key

Varchar(40) date Varchar(40)

| Name | Dob | Product |
|---|---|---|
| Ravi | 10-8-2017 | toothbrush |
| mahesh | 10-8-2017 | lux soap |
| Ravi | 10-8-2018 | lion dates |

CUSTOMER

```
insert into customer values('Ravi','10-8-2018','lion dates');
insert into customer values('Ravi','10-8-2017','lux');
```

how many PK's are created in the table

Only 1 PK for 2 columns.

# Difference between primary key and unique

**Primary key**

- Only one primary key is allowed per table
- Will not allow NULL values
- It will internally create clustered index.(we will understand later)

**Unique**

- Any number of unique constraints are allowed/table
- Will allow one NULL value
- Unique will create non clustered index.

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# Constraints assignment

| Int | varchar(40) | int | varchar(10) | int | varchar(40) |
|---|---|---|---|---|---|
| **Eid** | **Name** | **salary** | **bg** | **age** | **email** |
| 4 | ravi | 36000 | O+ve | 48 | ravi@gmail.com |
| 6 | suresh | 38000 | O+ve | 56 | null |

Req:

1.Eid column must not allow any duplicate or null values
2.Name column must not allow any  null values
3.Bg should have default value as o+ve
4.Age should have range from 18-60 years
5.Email column should allow only one null value and no duplicate values

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# Normalization

- using normalization we can reduce the data duplication or data redundancy.
- usually normalization process involves splitting a single table into multiple tables.
- It is recommended to create a new table for storing predictable repeating data .
- Ex: blood group names, state names / province names in a country…….
- normalization is used for avoiding the insert/update/delete anomaly or inconsistency

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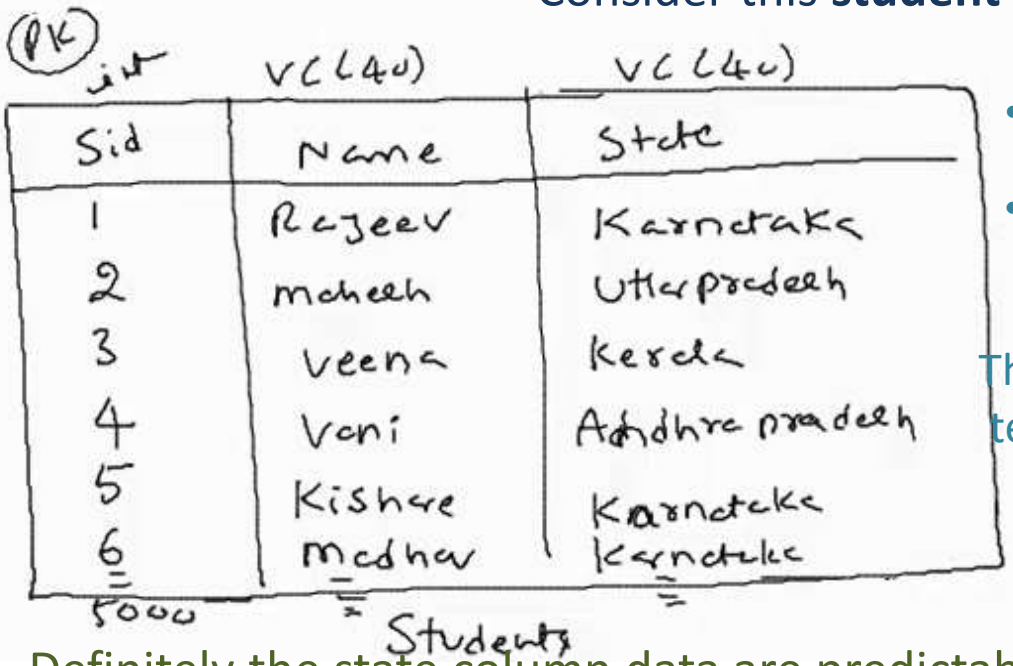
Consider this **student** table for understanding normalization




- Assume this table consist of 5000 records
- Observe the table and tell me , is there any data duplication (repetition of same data)

The state column data are duplicated , and tell me is state column data are predictable?

Definitely the state column data are predictable data, because we have only 29 states in our country. All the 5000 students must belong to any 1 of 29 states.

**Memory required for storing 1 state name is,**

**Then for storing all the state names how much memory is required ??**

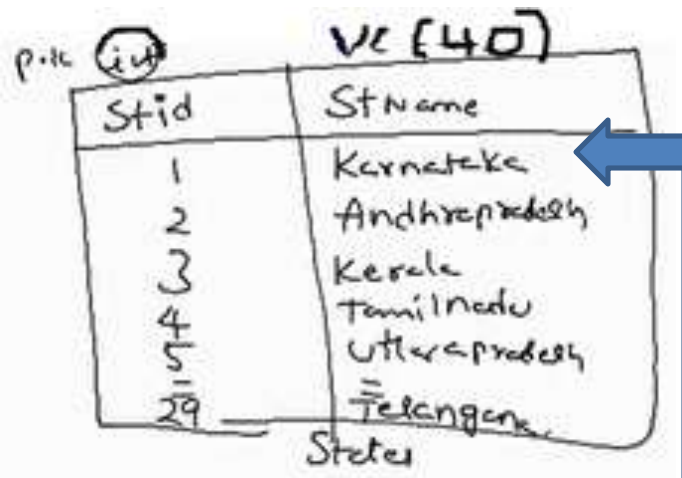
Very huge memory is required

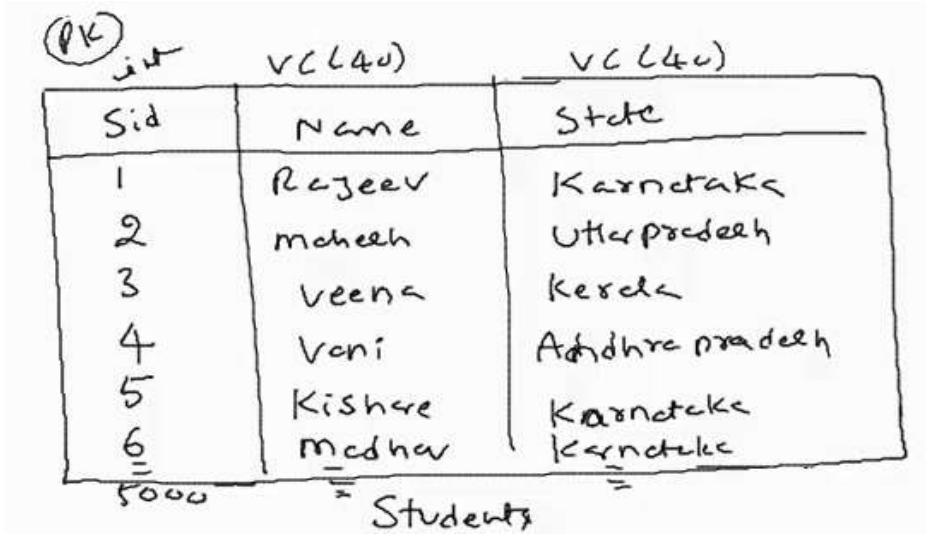
2000 → Karnataka → 9 Chars → 2 bytes × 9 = 18 bytes

2000 × 18 ⇒ 36000 bytes

How can we avoid this duplication, By splitting the single table into two tables

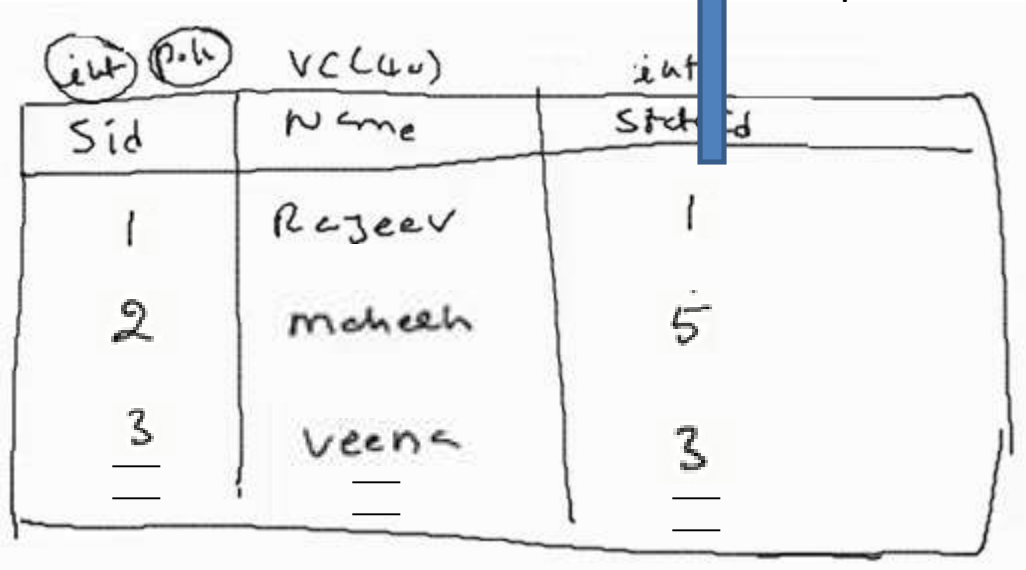
Now i have created 1 separate table for storing all the state names, and I have given a unique id For each state




Now I will create a student table and in place of state column , I will give the state id.

UnNormalized table




We have reduced the data duplication by using the **normalization** technique

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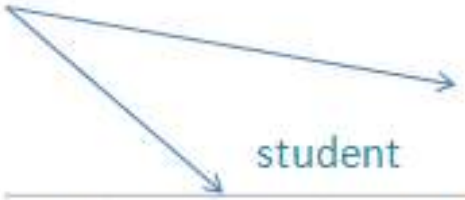
# Foreign key constraint

- Using Foreign key constraint we link / relate 2 or more tables.
- We can achieve referential integrity

When we are normalizing the tables there are chances for getting insert and update anomaly

student

| sid | name | state |
|---|---|---|
| 1 | rajeev | karnataka |
| 2 | mahesh | uttarpradesh |
| 3 | veena | kerala |
| 4 | vani | andhrapra... |
| 5 | kishore | karnataka |



student

| sid | name | stateid |
|---|---|---|
| 1 | rajeev | 1 |
| 2 | mahesh | 3 |
| 3 | veena | 6 |
| 4 | vani | 7 |
| 5 | kishore | 1 |
| 6 | abhinav | 286 ✘ |

states

| sid | sname |
|---|---|
| 1 | karnataka |
| 2 | tamilnadu |
| 3 | uttarpradesh |
| 4 | madhyapradesh |
| 5 | maharastra |
| 6 | kerala |
| 7 | andhrapradesh |

```
insert into student values(6,'abhinav',286)
```

To eliminate this problem, we will be using Foreign key constraint

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- Foreign key will allow null values
- Any number of Foreign key constraints can be created per table
- Any Fk column mapped to other column from any table must be defined with either with primary key or unique constraints

Syntax

```
Create  table  table_name
(
Col1  datatype  Foreign key  references table_name(column_name)
Col2  datatype
)
```

Example

```
create table state
(
sid int primary key,
statename varchar(40)
)
create table student
(
sid int,
name varchar(40),
stateid int
)

insert into student values(6,'abhinav',286)
```

Primary key

state

| sid | statename |
|---|---|
| 1 | karnataka |
| 2 | tamilnadu |
| 3 | uttarpradesh |
| 4 | madhyapradesh |
| 5 | maharastra |
| 6 | kerala |
| 7 | andhrapradesh |

How will you link the columns

| sid | name | stateid |
|---|---|---|
| 1 | rajeev | 1 |
| 2 | mahesh | 3 |
| 3 | veena | 6 |
| 4 | vani | 7 |
| 5 | kishore | 1 |

student

ERROR

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# Normalization lab1

- Normalize the employee2 table use foreign key

| eid | ename | age | bg | state |
|---|---|---|---|---|
| 1 | madhesh | 25 | o+ve | karnataka |
| 2 | suresh | 24 | o-ve | andhrapradesh |
| 3 | veena | 30 | o-ve | karnataka |
| 4 | kiran | 35 | b+ve | karnataka |
| 5 | ravi | 25 | b+ve | kerala |

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# Lab 1 solution

Blood_group

| id | bg |
|---|---|
| 1 | o+ve |
| 2 | o-ve |
| 3 | b+ve |
| 4 | b-ve |

state

| state_id | state_name |
|---|---|
| 1 | karnataka |
| 2 | tamilnadu |
| 3 | california |
| 4 | andhrapradesh |
| 5 | kerala |

Foreignkey

Foreignkey

employee2

| eid | ename | age | bg | state |
|---|---|---|---|---|
| 1 | madhesh | 25 | o+ve | karnataka |
| 2 | suresh | 24 | o-ve | andhrapradesh |
| 3 | veena | 30 | o-ve | karnataka |
| 4 | kiran | 35 | b+ve | karnataka |
| 5 | ravi | 25 | b+ve | kerala |

Un-normalized employee table

New_employee2

| eid | ename | age | bg | state |
|---|---|---|---|---|
| 1 | madhesh | 25 | 1 | 1 |
| 2 | suresh | 24 | 2 | 4 |
| 3 | veena | 30 | 2 | 1 |
| 4 | kiran | 35 | 3 | 1 |
| 5 | ravi | 25 | 3 | 5 |

Normalized employee table

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# Normalization Lab 2

- Normalize the student table and use foreign key

| id | name | city | state | country |
|---|---|---|---|---|
| 1 | kumar | banglore | karnataka | india |
| 2 | mahesh | mysore | karnataka | india |
| 3 | vishnu | banglore | karnataka | india |
| 4 | paul | San Franscisco | California | us |
| 5 | basker | chennai | tamilnadu | india |

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# Wrong solution

| cid | c_name |
|---|---|
| 1 | banglore |
| 2 | chennai |
| 3 | mysore |
| 4 | San Franscisco |
| 5 | hyderabad |

| state_id | state_name |
|---|---|
| 1 | karnataka |
| 2 | tamilnadu |
| 3 | california |
| 4 | andhrapradesh |
| 5 | kerala |

| country_id | country_name |
|---|---|
| 1 | india |
| 2 | united states |

F.K

F.K

F.K

| id | name | city_id | state_id | country_id |
|---|---|---|---|---|
| 1 | kumar | 1 | 1 | 1 |
| 2 | mahesh | 3 | 2 | 1 |
| 3 | vishnu | 1 | 1 | 1 |
| 4 | paul | 4 | 3 | 2 |
| 5 | baskar | 2 | 4 | 1 |

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# Wrong solution

Why?

| cid | c_name |
|---|---|
| 1 | banglore |
| 2 | chennai |
| 3 | mysore |
| 4 | San Franscisco |
| 5 | hyderabad |

| state_id | state_name |
|---|---|
| 1 | karnataka |
| 2 | tamilnadu |
| 3 | california |
| 4 | andhrapradesh |
| 5 | kerala |

| country_id | country_name |
|---|---|
| 1 | india |
| 2 | united states |

F.K

F.K

F.K

| id | name | city_id | state_id | country_id |
|---|---|---|---|---|
| 1 | kumar | 1 | 1 | 1 |
| 2 | mahesh | 3 | 2 | 1 |
| 3 | vishnu | 1 | 1 | 1 |
| 4 | paul | 4 | 3 | 2 |
| 5 | baskar | 2 | 4 | 1 |
| 6 | Suresh | 1 | 2 | 2 |

Is it a valid data?

Assume we are trying to insert

```
insert into student values(6,'Suresh',1,2,2)
```

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# Solution

Normalized student table

Un-normalized student table

student

| id | name | city_id |
|---|---|---|
| 1 | kumar | 1 |
| 2 | mahesh | 3 |
| 3 | vishnu | 1 |
| 4 | paul | 4 |
| 5 | baskar | 2 |

student

| id | name | city | state | country |
|---|---|---|---|---|
| 1 | kumar | banglore | karnataka | india |
| 2 | mahesh | mysore | karnataka | india |
| 3 | vishnu | banglore | karnataka | india |
| 4 | paul | San Franscisco | California | us |
| 5 | basker | chennai | tamilnadu | india |

F.K

F.K

F.K

| cid | c_name | state_id |
|---|---|---|
| 1 | banglore | 1 |
| 2 | chennai | 2 |
| 3 | mysore | 1 |
| 4 | San Franscisco | 3 |
| 5 | hyderabad | 4 |

city

| sid | statename | country_id |
|---|---|---|
| 1 | karnataka | 1 |
| 2 | tamilnadu | 1 |
| 3 | andhrapadesh | 1 |
| 4 | california | 2 |
| 5 | kerala | 1 |

state

| country_id | country_name |
|---|---|
| 1 | india |
| 2 | united states |

country

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# Normalization lab3

## Req:Design Normalized Database

suresh
DotNet

Batch1
18989
19989

Mahesh
android

Batch1
19000
20989

kiran
Android

Batch2
19000
20989

kumar
DotNet

Batch2
18000
19989

veena
DotNet

Batch1
19989
19989

Bharath
UIDeveloper

Dotnet
9000
12989

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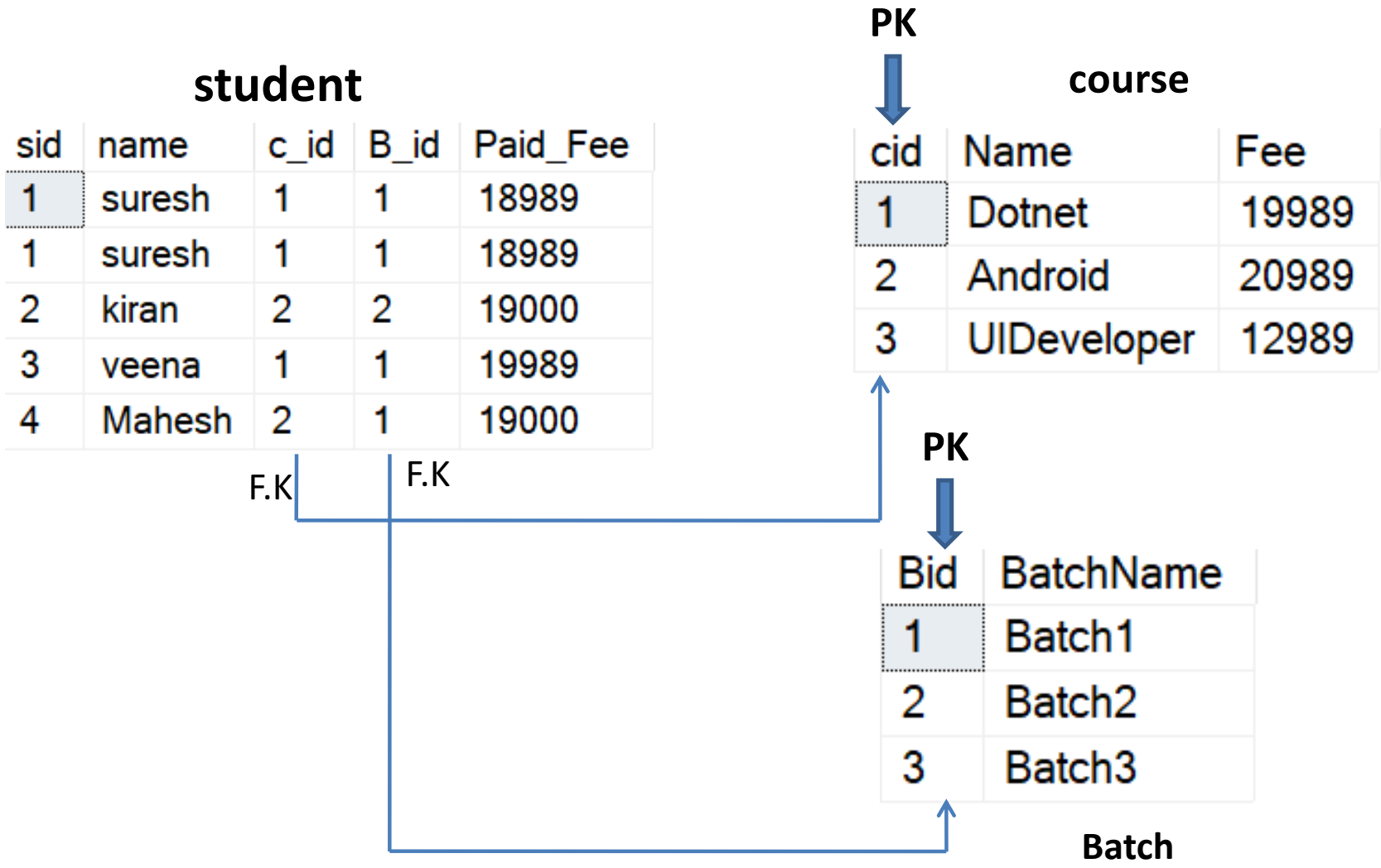
# Normalization lab3-Solution

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# Types Of t-sql Statements

- t-sql statements categorized into
- DML Statements(Insert, Update, Delete, Select * into )
- DDL Statements (Create, Alter)
- DQL Statements (All Select statements except select * into )
- TCL Statements (Commit, Rollback)
- DCL Statements (Grant, Revoke used only by DBA’s not by DB Programmers)

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# Generic Select Statement

**SELECT select_list**

**[INTO new_table_name]**

**FROM table_list**

**[WHERE search_conditions]**

**[GROUP BY group_by_list]**

**[HAVING search_conditions]**

**[ORDER BY order_list [ASC | DESC]]**

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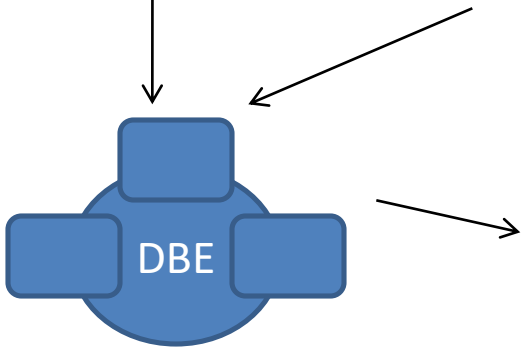
# Select sample 1

employee

| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-26 |
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |

Display all employee Details.

**Select * from employee**




**Select eid,fname,lname,age,salary,dept,doj from employee**

| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-26 |
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |

Ask students to take table data in last page of their note.

Employee

| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-26 |
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |

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# Select sample-2

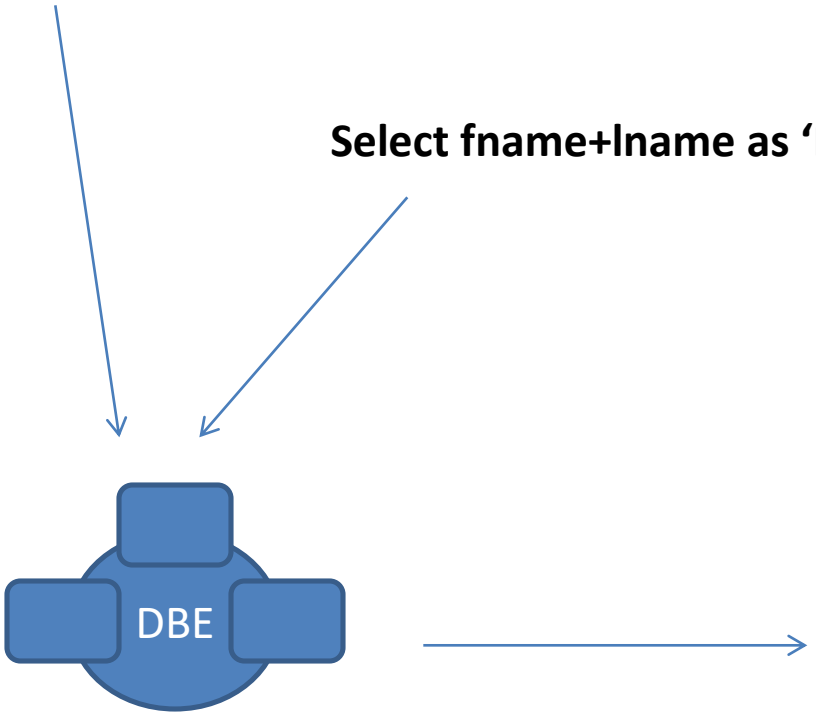
write a query for producing the following result set
From employee table

ERS

| Fullname | age |
|---|---|
| rajeevsukla | 23 |
| sowmyakumari | 23 |
| kishorekumar | 27 |
| abimanyubiswal | 22 |
| ═══ | ═══ |

**Select fname+lname,age from employee**

**Select fname+lname as 'Fullname',age from employee**




| No default name | age |
|---|---|
| rajeevsukla | 23 |
| sowmyakumari | 23 |
| kishorekumar | 27 |
| abimanyubiswal | 22 |
| ═══ | ═══ |

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# Table : Patient

Pid→ int

Fname→varchar(40)

Lname→varchar(40)

Age→int

Bg→Varchar(40)

- Table must be created without any constraints

Note: Create this table in the last pages of your note book as this table used for explaining all topics in t-sql.

| pid | fname | lname | age | bg |
|---|---|---|---|---|
| 1 | madhava | reddy | 45 | o+ve |
| 2 | abhinav | bandra | 45 | o-ve |
| 4 | hari | kiran | 60 | b-ve |
| 3 | madhava | kiran | 52 | o+ve |
| 5 | veena | kumari | 42 | NULL |
| 6 | k_iran | kumar | 39 | b-ve |
| 2 | abhinav | bandra | 45 | o-ve |
| 7 | mahes%h | nambootri | 36 | b+ve |
| 8 | rahul | kumar | 46 | b-ve |
| 9 | bharat | kumar | 56 | b-ve |

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# Select Statement Lab-1

- Write a query for displaying all data present in patient table ( using * )
- Write a query for displaying all columns data present in patient table without using *
- Write a query for displaying all patients fullnames, pid, age

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# Select Statement Lab-2

- Write a query for displaying all patients full names along with the ages by incrementing all patients age by 2 years ( Sample ERS)

| fullname | age |
|---|---|
| madhavareddy | 47 |
| abhinavbandra | 47 |
| harikiran | 62 |
| _____ | ___ |
| _____ | ___ |

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# Select Statement Lab-3

- write a select statement for displaying the following result set?

| patient details |
| --- |
| madhava reddy's bg is o+ve and he/she is from India |
| abhinav bandra's bg is o-ve and he/she is from India |
| hari kiran's bg is b-ve and he/she is from India |
| madhava kiran's bg is o+ve and he/she is from India |
| NULL |
| k_iran kumar's bg is b-ve and he/she is from India |
| abhinav bandra's bg is o-ve and he/she is from India |
| mahes%h nambootri's bg is b+ve and he/she is fro... |
| rahul kumar's bg is b-ve and he/she is from India |
| bharat kumar's bg is b-ve and he/she is from India |

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# Order By Clause

- Used to **Order data** present **in** a **table** based on **One or more columns**.
- Use **ASC** keyword for ascending order and **DESC** for descending order.
- Default Order is ASC
- Syntax:

**select_list order by c1 Asc/Desc,c2 Asc/Desc,..**

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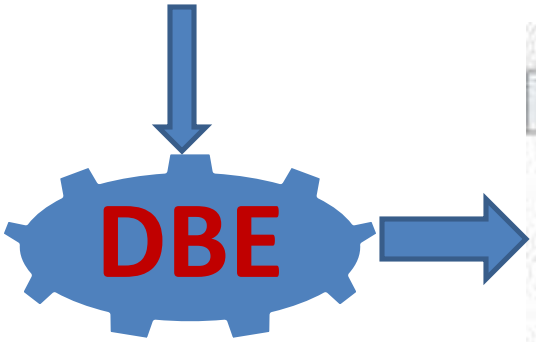
# Employees table

| int | Vc(40) | Vc(40 | int | int | Vc(40) | date |
|---|---|---|---|---|---|---|
| eid | fname | lname | age | salary | dept | doj |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-26 |
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |

Display employees in ascending order of their fname.

Select * from employees order by fname




## Final Result set

| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-26 |
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |

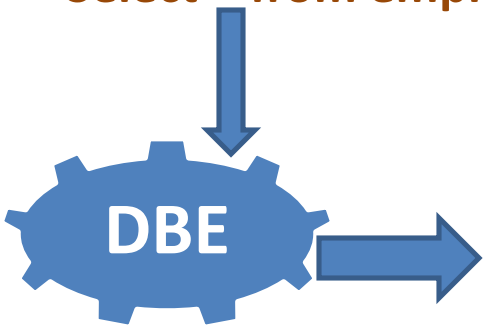
# Employees table

int Varchar(40) Varchar(40) int int Varchar(40) date

| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-26 |
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |

Display employee in desc order of their first name

**Select * from employees order by fname desc**




**FRS created**

| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-26 |

Draw the final result set .

## Employees table

| int | Varchar(40) | Varchar(40) | int | int | Varchar(40) | date |
|---|---|---|---|---|---|---|
| eid | fname | lname | age | salary | dept | doj |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-26 |
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |

**Select * from employees order by lname,fname desc**

**Modifies the query**

**Select * from employees order by lname asc,fname desc**

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**Employees table**

**Select * from employees order by lname asc,fname desc**

| int | Varchar(40) | Varchar(40) | int | int | Varchar(40) | date |
|---|---|---|---|---|---|---|
| eid | fname | lname | age | salary | dept | doj |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-26 |
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |

**FRS**

| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-26 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |

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# Order By Lab-1

- Identify the output for the following query?

Select fname+lname as ‘full name’, age from patient order by age

- Identify the output for the following query?

select fname, lname, bg from patient order by bg desc

Note: **ascii** for **+** is **43** and for **–** is **45**

- Identify the output for the following query?

select fname, lname, pid from patient order by lname, fname desc

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# Order By Lab-2

- Identify the result set for the following query?

  select fname,age from patient order by ‘Hello’+fname+lname desc

- write a query for displaying all patients data in the descending order of their ages?

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# Distinct clause

- Distinct clause is used for eliminating duplicate rows from result set
- Syntax: distinct single column name

  or distinct column1,column2,….

  or distinct *

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| Int | varchar(40) | varchar(40) | int | int | varchar(40) | date |
|---|---|---|---|---|---|---|
| eid | fname | lname | age | salary | dept | doj |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-26 |
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |

# EMPLOYEES TABLE

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# QUERY: select distinct * from employees

| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-26 |
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |

DBE produces **IRS** without considering distinct clause

INTERMEDIATE RESULT SET

FINAL RESULT SET

| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-26 |
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |

# select distinct lname from employees

DBE produces **IRS** without considering distinct clause

| lname |
| --- |
| sukla |
| kumari |
| kumar |
| biswal |
| ~~kumar~~ |
| _singh |
| moh%anty |
| _kumari |
| ~~sukla~~ |

INTERMEDIATE RESULT SET

| Lname |
| --- |
| sukla |
| kumari |
| Kumar |
| biswal |
| _singh |
| Moh%anty |
| _kumari |

# Distinct Lab-1

- Identify the result set for the following query?
- select distinct fname, age from patient
- Identify the result set for the following query?
- select distinct age, bg from patient
- Identify the result set for the following query?
- select distinct fname, age from patient order by bg desc

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# top clause

- top clause is used to fetch top n rows or first n rows from a table.
- Syntax : select top **n** column from table_name

  or select top **n** column1,column2,.. from table_name

  Here **n** can be any number

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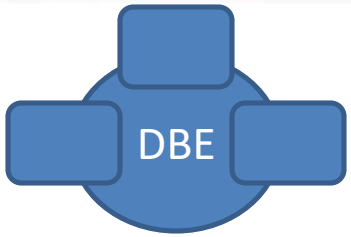
Display the first 5 records from employee table

employee

| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-26 |
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |

**Select top 5 * from employee**




Final result set

| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |

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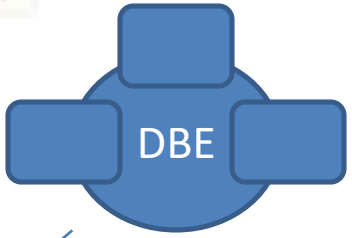
Display fname , lname and age column data for first 3 records from employee table

| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-26 |
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |

employee

**Select top 3 fname,lname,age from employee**




| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |

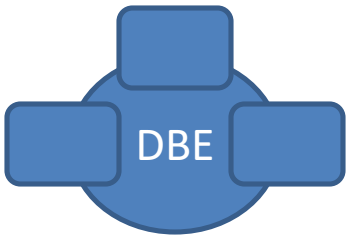
IRS

FRS

| fname | lname | age |
|---|---|---|
| rajeev | sukla | 23 |
| sowmya | kumari | 23 |
| kishore | kumar | 27 |

# Write a query to display the top 3 highest paid employee's fullname and age

Select top 3 fname+lname as 'fullname' ,age from employee order by salary desc




IRS1

| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 7 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |
| 8 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-26 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 4 | abima... | biswal | 22 | NULL | android | 2010-02-20 |

IRS2

| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |

Final Result Set

| fullname | age |
|---|---|
| kishorekumar | 27 |
| sonikumar | 24 |
| sowmyakumari | 23 |

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Employee

| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |
| 8 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-26 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| ~~1~~ | ~~rajeev~~ | ~~sukla~~ | ~~23~~ | ~~12000~~ | ~~.net~~ | ~~2011-10-23~~ |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 7 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |

**select distinct top 6 fname,age from employee order by age desc**

| fname | age |
|---|---|
| kishore | 27 |
| soni | 24 |
| _dinesh | 23 |
| rajeev | 23 |
| sowmya | 23 |
| abimanyu | 22 |

Final result set

Draw the result set for this query

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# top clause Lab-1

- Identify the output for the following query?
- select top 3 fname, lname, age from patient
- Write a query for displaying top 3 patients details in the descending order of their age?
- ERS:

| pid | fname | lname | age | bg |
|---|---|---|---|---|
| 4 | hari | kiran | 60 | b-ve |
| 9 | bharat | kumar | 56 | b-ve |
| 3 | madhava | kiran | 52 | o+ve |

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# where clause

- where clause is used to filter the records present in a table.
- where clause can be applied on select or update or delete statements.
- syntax: where <condition>

For writing a condition, we have to understand the operators

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# operators part-1

>, >=, <, <= ,!= ,<> , and, or, between,

not between ,In, not in, is null,

is not null, all, any

Conditional AND(&&),conditional OR(||) are not supported in t-sql

Bitwise And(&),bitwise(|) are supported in t-sql but we never use in real time applications

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# operators part-2

while using in or not in we must use set of values.

## Ex: where col1 in (val1,val2,…)

while checking for null values we must use either is null or is not null

while using between or not between we must use min value first and max value later

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Req: display employees details whose salary is greater than 20000

| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-26 |
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |

Query: select * from employees where salary>20000

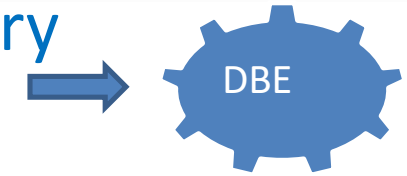
| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |

Technologies

# Req: display all employees details whose salary is between 15000 and 25000

| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-26 |
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |

Query: select * from employees where salary between 15000 and 25000




| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-26 |
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |

logies

Req: display all employees details whose salary is less than 15000  greater than 25000

| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-26 |
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |

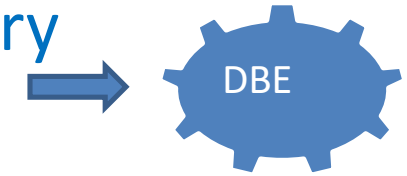
Query: select * from employees where salary not between 15000 and 25000

| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |

# Req: display all employees details whose salary is equal to 15000 or21000 or 36000

| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-26 |
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |

Query: select * from employees where salary in(15000,21000,36000)

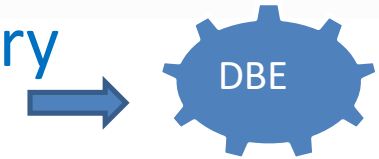



| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-26 |

# Req: display all employees details whose salary is not equal to 15000 or21000 or 36000

| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-26 |
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |

Query: select * from employees where salary not in(15000,21000,36000)

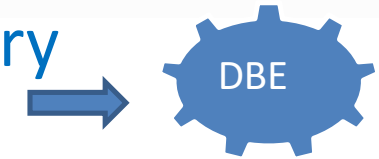



| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |

# Req: display all employees details whose salary is null

| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-26 |
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |

Query: select * from employees where salary is null




| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 |

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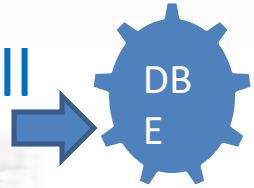
# Req: display all employees details whose salary is not null

| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-26 |
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |

## Query: select * from employees where salary is not null




| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-26 |
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |

nologies

# where clause lab-1

- write a query for displaying all patients details whose age is greater than 45?

  select * from patient where age>45

- write a query for displaying all patients details whose age is between 40 and 50 (write query in all possible ways)?

Select * from patient where age  between 40 and 50

Select * from patient where age>=40 and age<=50

- write a query for displaying all patients details whose age is greater than 40 and whose bg is not o+ve?
- Select * from patient where age>40 bg!='o+ve'

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# where clause lab-2

- write a query for displaying all patient details whose bg is not null?

select * from patient where bg is not null

- write a query for displaying all patient details whose age is equal to 42 or 36 or 60 (write query using all possible ways)?

select * from patient where age=42 or age=36 or age=60

select * from patient where age in (42,36,60)

- write a query for displaying all patient details whose age is not equal to 42 and 36 and 60 (write query using all possible ways)?

select * from patient where age!=42 or age!=36 or age!=60

select * from patient where age not in (42,36,60)

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# where clause lab-3

- identify the result set for the following query?

  select top 3 * from patient where age>40 order by bg desc

  (student must identify which portion of the query is executed first, also write IRS and FRS)

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# like clause & pattern matching

- using like clause we can find data which is matching to a specific pattern.
- syntax : where column|expression|variable like ‘pattern’
- wildcard characters used in pattern matching

| Wildcard character | description |
|---|---|
| % | 0 or more characters |
| _ | Any single character |
| [] | Any single character within a specified range or in a set of characters |
| ^ | Any single character not within the specified range or in a set of characters. |

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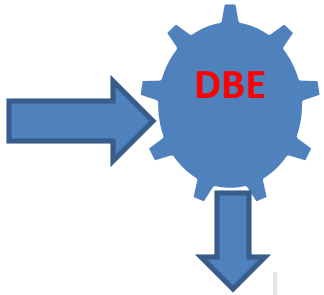
## employees

| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-26 |
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |

**Requirement:** Display employee details who having fname starting with character 'a'

**Solution:** select * from employees where fname like 'a%'




**FRS**

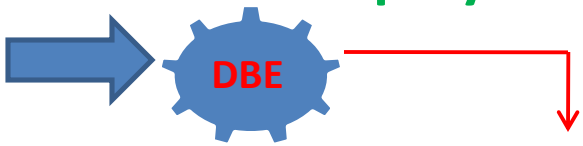
| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 00:00:00.000 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 00:00:00.000 |

## employees

| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-26 |
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |

**Requirement:**Display employee details who having fname ending with character ‘a’

**Solution:**select * from employees where fname like ‘%a’




| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 00:00:00.000 |
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 00:00:00.000 |

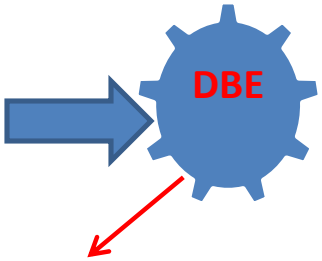
Technologies

## employees

| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-26 |
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |

**Requirement:**Display employee details who having fname having character 'a' in second position

**Solution:**select * from employees where fname like '_a%'




FRS

| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 00:00:00.000 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 00:00:00.000 |

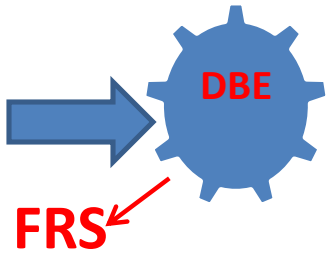
Technologies

## employees

| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-26 |
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |

**Requirement:**Display employee details whose fname having character 'a' anywhere in fname

**Solution:**select * from employees where fname like '%a%'



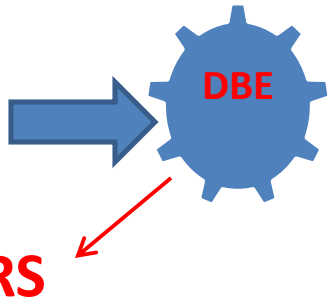

| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 00:00:00.000 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 00:00:00.000 |
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 00:00:00.000 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 00:00:00.000 |
| 8 | nishala | _kumari | 22 | 18000 | .db | 2008-07-19 00:00:00.000 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 00:00:00.000 |

## employees

| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-26 |
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |

**Requirement:** Display employee details whose lname having character 'a' anywhere but not in last position ( last char can be any

**Solution:** select * from employees where lname like '%a%_'




| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-26 |
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |

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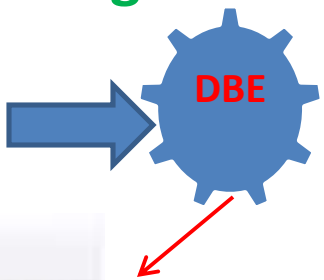
employees

| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-26 |
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |

**Requirement:**Display employee details whose lname having character ‘a’ in second last position

**Solution:**select * from employees where lname like ‘%a_’




FRS

| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |

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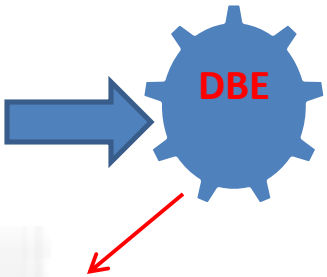
employees

| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-26 |
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |

**Requirement:**Display employee details whose fname starting with character a-k

**Solution:**select * from employees where fname like '[a-k]%'




| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |

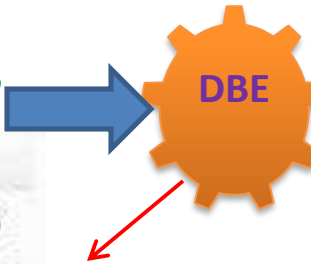
echnologies

employees

| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-26 |
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |

**Requirement:**Display employee details whose fname not starting with character a-k

**Solution:**select * from employees where fname like '[^a-k]%'




| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-26 |
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |

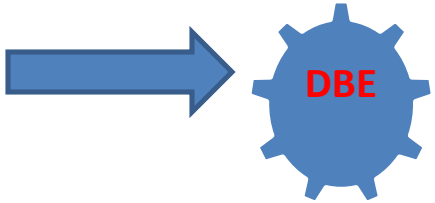
chnologies

## employees

| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-26 |
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |

**Requirement:** Display employee details whose fname having character 'a' anywhere in fname and data must displayed in descending order of their salaries

**Solution: select * from employees where fname like '%a%' order by salary desc**

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## employees

| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-26 |
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |

## FRS created

| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 |

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## employees

| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-26 |
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |

## FRS created

| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |

Technologies

**employees**

| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-26 |
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |

**Requirement:** Display employee details whose fname are having character 'i' in third position

**Solution: select * from employees where fname like '__i%'**

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## employees

| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-26 |
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |

## FRS created

| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-26 |

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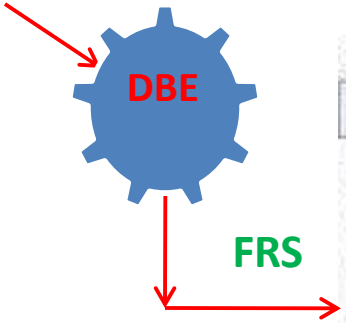
**employees**

| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-26 |
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |

**Requirement:** Display employee details whose fname are not ending with character 'a'

**Solution: select * from employees where fname not like '%a'**




| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-26 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |

# Like clause Lab-1

- write a query for displaying all patient details whose fname's are starting with character **m**?
- write a query for displaying all patients full names whose lnames are ending with **i?**
- write a query for displaying all patients details whose lnames are having character **a** in the second position from ending ? for ex.. kir**a**n is having character **a** in the **second position** from **ending**

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# Like clause Lab-2

- write a query for displaying all patient details whose fnames are having character **r** in the 3rd position from ending?
- write a query for displaying all patient details whose fnames are having character **i** any where ?
- write a query for displaying all patient details whose fnames are starting with either **a** or **b** or **c** or **d** or **e** or **f** characters?

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# GENERIC INSERT,UPDATE AND DELETE STATEMENTS

USED TO MODIFY OUR TABLE DATA

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syntax for generic insert statement

insert into table_name(c1,c2,c3….)

values(v1,v2,v3…)

note: insert statement will not contain where clause

syntax for generic update statement

update table_name set c1=v1,c2=v2, ….[where condition]

note: update statement without where will update the complete table data

syntax for generic delete statement

delete [from] table_name [where condition]

note: delete statement without where will delete all data present in a table.

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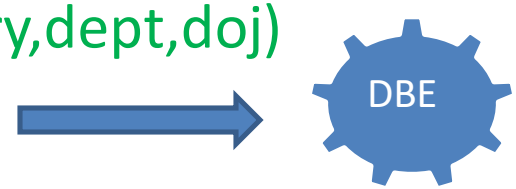
Req:insert a new record into employee table with eid=9,fname=giri, lname=babu,age=27,salary 18000,dept=.net,doj=06-24-2014

```
Insert into employees(eid,fname,lname,age,salary,dept,doj)
values(9,'giri','babu',27,18000,'.net','06-24-2014')
```




| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 1 | Rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 3 | Kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 4 | Abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 5 | sony | Kumar | 24 | 21800 | .net | 2009-06-21 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-19 |
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |
| 1 | Rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |

employees

| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 9 | giri | babu | 27 | 18000 | .net | 2014-06-24 |
| 1 | Rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 3 | Kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 4 | Abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 5 | sony | Kumar | 24 | 21800 | .net | 2009-06-21 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-19 |
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |
| 1 | Rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |

FRS

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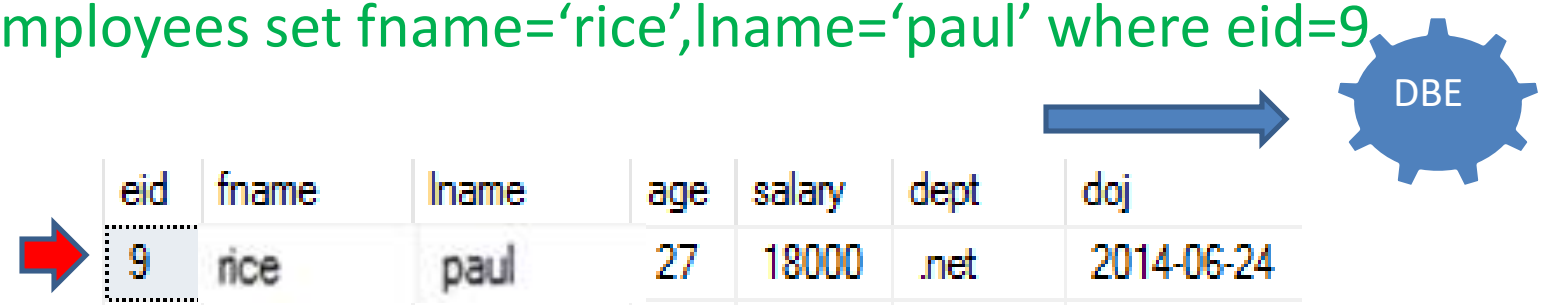
# Req:update employee table with fname to rice, lname to paul whose eid is 9

update employees set fname='rice',lname='paul' where eid=9




| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 9 | rice | paul | 27 | 18000 | .net | 2014-06-24 |
| 1 | Rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 3 | Kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 4 | Abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 5 | sony | Kumar | 24 | 21800 | .net | 2009-06-21 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-19 |
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |
| 1 | Rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |

FRS

employees

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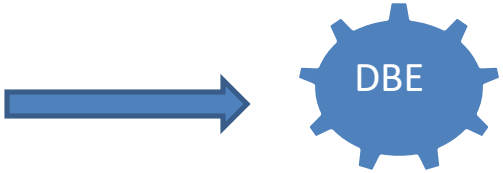
# Req: delete a record from employee table whose eid is 9

delete employees where eid=9




| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 9 | rice | paul | 27 | 18000 | .net | 2014-06-24 |
| 1 | Rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 3 | Kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 4 | Abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 5 | sony | Kumar | 24 | 21800 | .net | 2009-06-21 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-19 |
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |
| 1 | Rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |

employees

| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 1 | Rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 3 | Kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 4 | Abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 5 | sony | Kumar | 24 | 21800 | .net | 2009-06-21 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-19 |
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |
| 1 | Rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |

FRS

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# Insert Update Delete Lab-1

- write a query for inserting the following patient details into patient table?

  patient id=10 fname='ahaha' lname='kumar' age=78 bg='o+ve' ( write query using all possible ways )
- write a query for inserting the following patient details into patient table?

  patient id=11 fname='silli' lname='suresh' age=81 bg is null ( write query using all possible ways )

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# Insert Update Delete Lab-2

- write a query for updating the 10th patient (pid=10) with the following details?

  fname='raja' lname='raveender' age=66 bg='o-ve'
- write a query for updating the 11th patient (pid=11) with the following details?

  fname='meena' lname='kumari'
- write a query for deleting 10th and 11th patients from patient table?

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delete

drop

truncate

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# delete without where

- a delete statement without where clause will delete complete table data.
- delete statement is a **logged operation**.
- delete operation is a **reversible operation**.
- delete operation is slow compared to truncate operation.

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## Patient table

| Pid | FName | Lname | age | bg |
|---|---|---|---|---|
| 1 | Madhava | reddy | 45 | O+ve |
| 2 | Hari | kiran | 60 | B-ve |

Delete patient

Similar table will be created in .ldf

.ldf

| Pid | FName | Lname | age | bg |
|---|---|---|---|---|
| | | | | |
| | | | | |

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# Truncate table

truncate table statement will delete all data present in a table.

truncate statement is not a logged operation and hence we can't rollback this operation.

**syntax:** truncate table table_name

"truncate operation" is faster than "delete without where clause".

truncate statement can't contain where clause

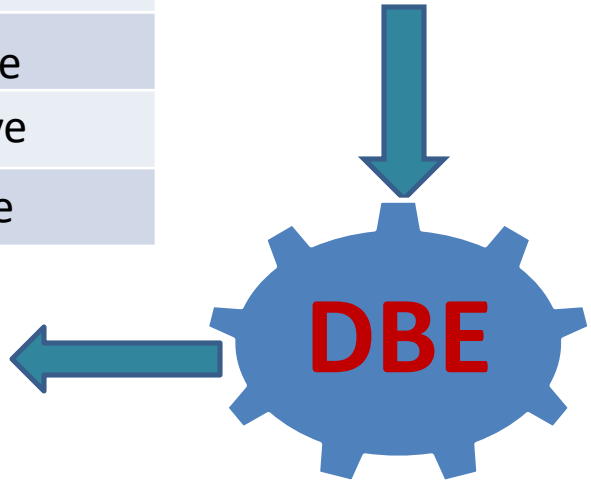
Ralle Technologies

## Patient Table

| P_Id | FName | LName | age | bg |
|---|---|---|---|---|
| 1 | Madhava | Reddy | 45 | O+ve |
| 4 | Hari | kiran | 60 | B-ve |
| 3 | Madhava | kiran | 52 | O+ve |
| 5 | Veena | kumari | 42 | Null |
| 6 | K_iran | kumar | 39 | B-ve |
| 2 | Abhinav | bandra | 45 | O-ve |
| 7 | Mahes%h | Nambotri | 36 | B+ve |

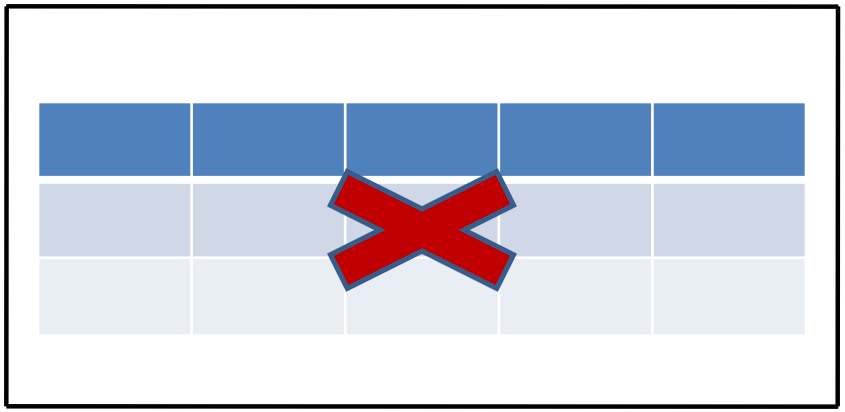
Table structure will not delete

Truncate table patient




No similar table will be created in .ldf

.ldf



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# Drop table

- drop table operation will delete the table from the database and also the related constraints and indexes.
- syntax: drop table table_name
- drop is not a logged operation

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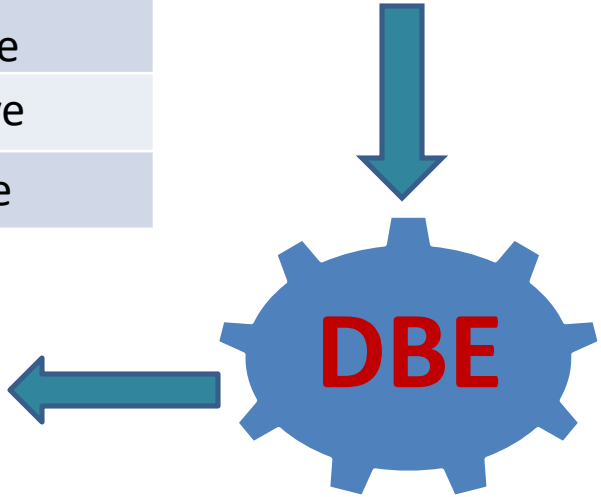
**Patient Table**

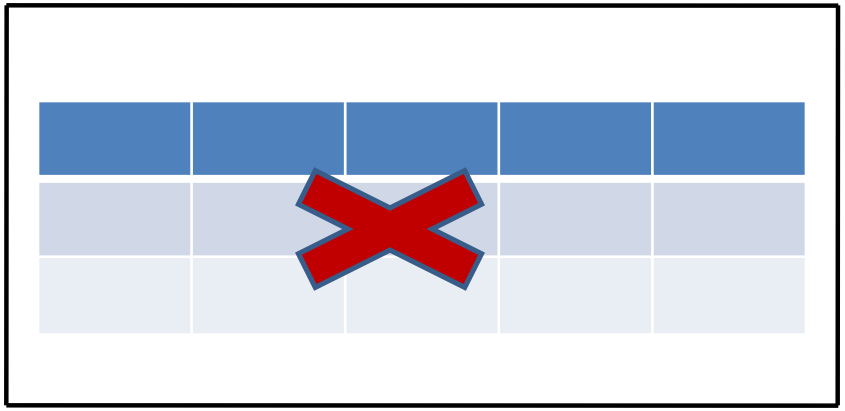
| P_Id | FName | LName | age | bg |
|---|---|---|---|---|
| 1 | Madhava | Reddy | 45 | O+ve |
| 4 | Hari | kiran | 60 | B-ve |
| 3 | Madhava | kiran | 52 | O+ve |
| 5 | Veena | kumari | 42 | Null |
| 6 | K_iran | kumar | 39 | B-ve |
| 2 | Abhinav | bandra | 45 | O-ve |
| 7 | Mahes%h | Nambotri | 36 | B+ve |

**Table structure also deleted**

**Drop table patient**




**.ldf**



**No similar table will be created in .ldf**

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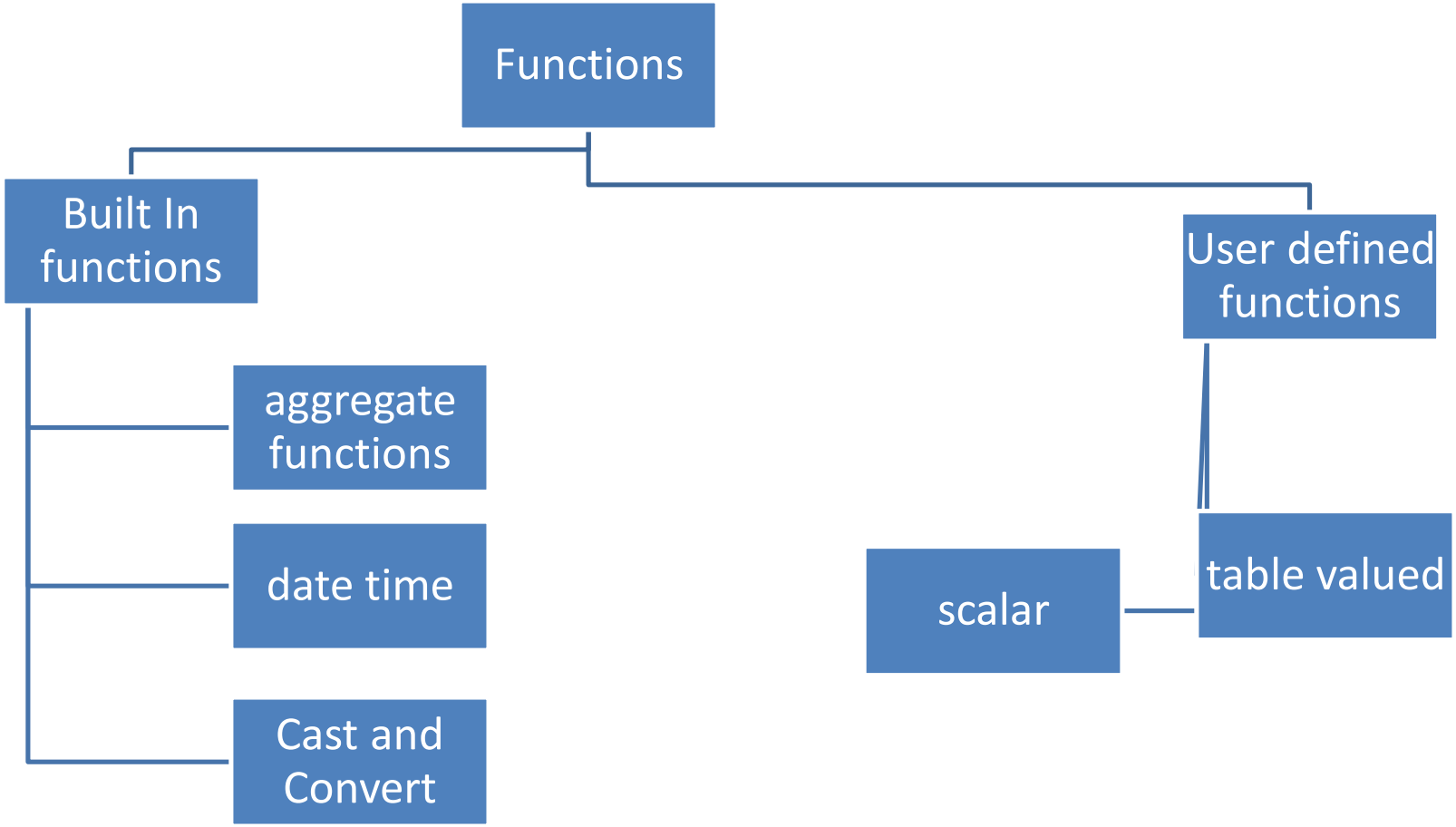
# Functions

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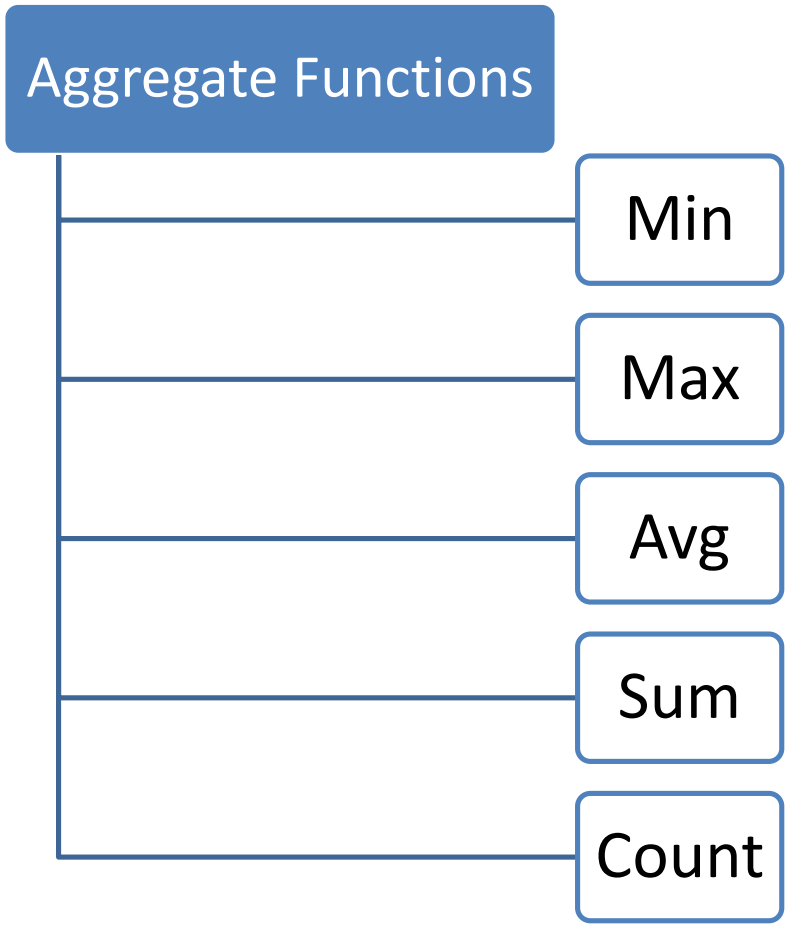
# aggregate functions

Note: we are not allowed to use aggregate functions in where clause

Note2: we are not allowed to use columns in select list which are not linked with aggregate functions when any column is linked with aggregate function

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employee

| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-26 |
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |

| n | tot_salary |
|---|---|
| 3 | 145800 |

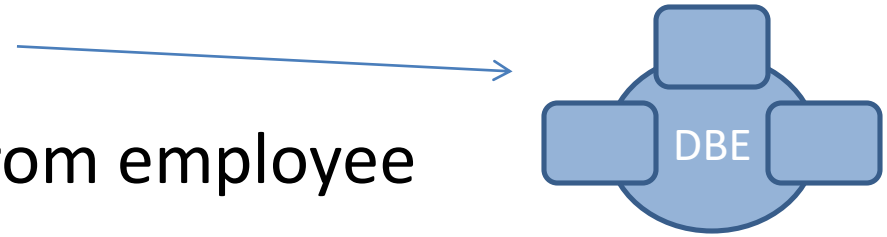
| min_sal | n name) |
|---|---|
| 12000 | |

Select AVG(age) from employee

Select MIN(salary) as ‘min_sal’ from employee

Select Max(salary) as ‘min_sal’ from employee

Select SUM(salary) as ‘tot_salary’ from employee



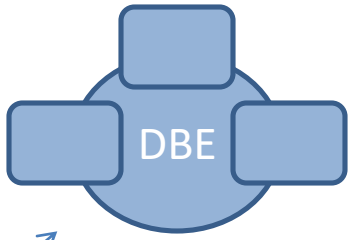

Technologies

employee

| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-26 |
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |

| re | result |
|---|---|
| 9 | 4 |

Select COUNT(*) as ‘result’ from employee




Select COUNT(*) as ‘result’ from employee where dept=‘.net’

# aggregate functions lab-1

- write a query/program for displaying youngest patient age, eldest patient age, sum of all patients age and average age of patients?

ERS:

| min age | max age | tot age | avg age |
|---|---|---|---|
| 36 | 60 | 466 | 46 |

- identify the output for the following query?

**query:** select fname from patient where min(age)=age;

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# aggregate functions lab-2

- write a program for displaying youngest and eldest patients fnames?

ERS:

| youngest | eldest |
| --- | --- |
| mahes%h | hari |

- identify the output for the following program?

```
select MIN(age) as 'min age', fname from patient
```

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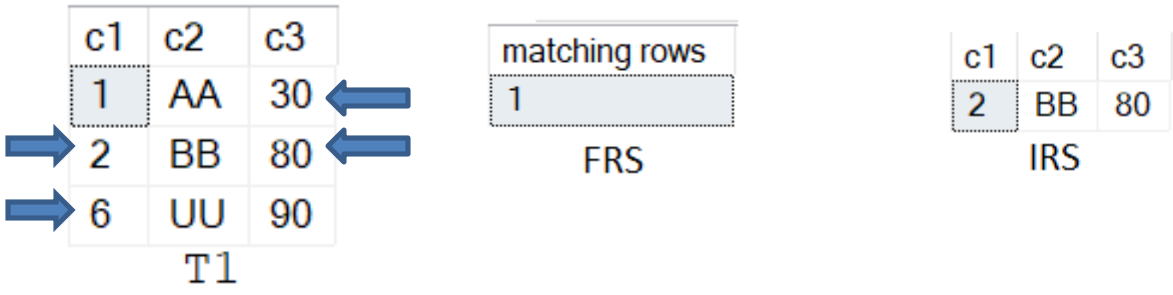
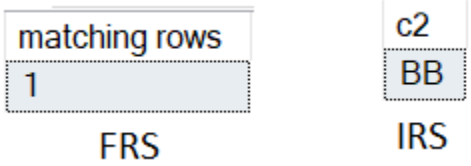
# count function

- count function gives total number of matched records count from an intermediate result set.

```
select COUNT(*) as 'matching rows'  from T1 where c1>1 and c3<90
```




```
select COUNT(c2) as 'matching rows'  from T1 where c1>1 and c3<90
```

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# count function lab-1

- identify the output for the following query?

```
select COUNT(age) as 'tot rows',MAX(Age) as 'max age' from patient where age>45
```

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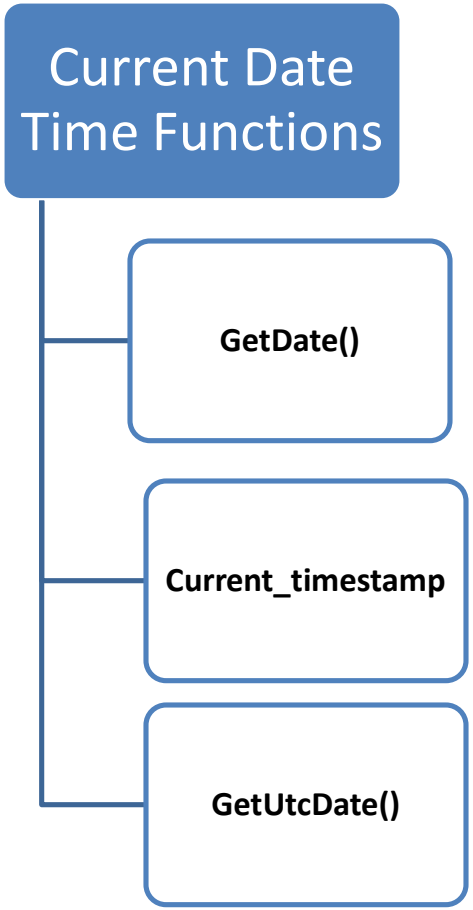
# date time functions




datename

datepart

day

month

year

dateadd

datediff

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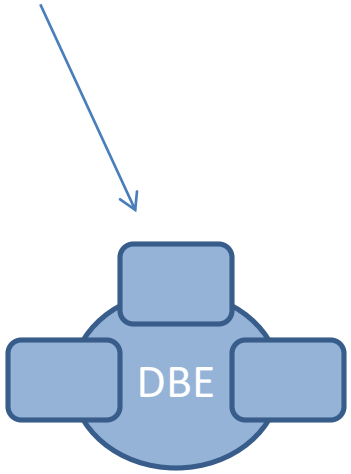
# Date time function

Functions which gives current system date and time:

1. Getdate()
2. Getutcdate()
3. Current_timestamp

**insert into employee values (11,'ram','kumar',23,17000,'.net',GETDATE())**

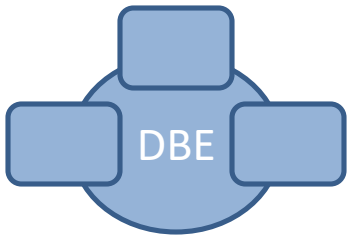



employee

| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-26 |
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 11 | ram | kumar | 23 | 17000 | .net | 2018-01-12 |
| 12 | ram | kumar | 23 | 17000 | .net | 2018-01-12 |
| 13 | ram | kumar | 23 | 17000 | .net | 2018-01-12 |

## Functions which gives date and time parts:

1. Datename(datepart,date)→varchar
2. Datepart(datepart,date)→int
3. Day(date)→int
4. Year(date)→int
5. Month(date)→int




Select datename(month,getdate())

| (No column name) |
| --- |
| January |

Select datename(year,getdate())

| (No column name) |
| --- |
| 2018 |

Select datename(WEEKDAY,GETDATE()) as 'day'

| day |
| --- |
| Friday |

Select datename(day,getdate())

| (No column name) |
| --- |
| 12 |

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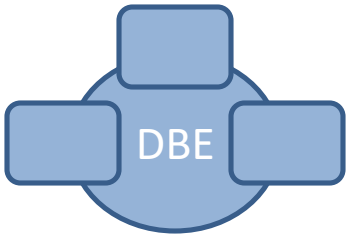
# Date part function

```
declare @d1 date;
set @d1='03/14/1979'
select DATEPART(YEAR,@d1)
```

```
declare @d2 date;
set @d2='03/14/1979'
select DATEPART(MONTH,@d2)
```

```
declare @d3 date;
set @d3='03/14/1979'
select DATEPART(DAY,@d3)
```




| (No column name) |
| --- |
| 1979 |

| (No column name) |
| --- |
| 3 |

| (No column name) |
| --- |
| 14 |

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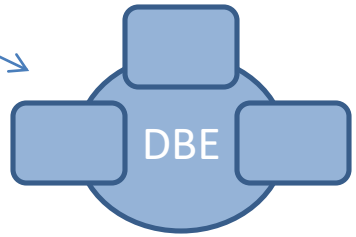
```
declare @d1 date;
set @d1='03/14/1979'
select Year(@d1)
```

```
declare @d2 date;
set @d2='03/14/1979'
select month(@d2)
```

```
declare @d3 date;
set @d3='03/14/1979'
select day(@d3)
```




| (No column name) |
| --- |
| 1979 |

| (No column name) |
| --- |
| 3 |

| (No column name) |
| --- |
| 14 |

# date add and date diff functions

- dateadd function used to add a specified number of years/months/days/hours/minutes/seconds to a specified date or date time value.
- syntax: dateadd(datepart,number,datevalue) →returns varchar
- datediff function used to find difference between two date time values either in days/months/years/hours/minutes/seconds etc.
- syntax: datediff(datepart,startdate,enddate)→ returns int

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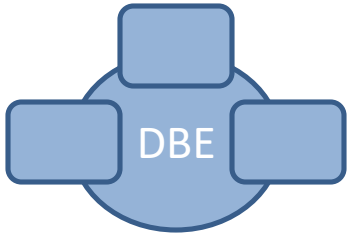
declare **@d date**
set **@d='12/26/1979'**

set **@d=dateadd(year,12,@d)**




@dob

1991-12-26

declare **@d1 date**
set **@d1=GETDATE();**

set **@d1=dateadd(MONTH,5,@d1)**

@dob1

2018-06-12

declare **@d2 date**
set **@d2=GETDATE();**

set **@d1=dateadd(DAY,15,@d2)**

@dob2

2018-01-27

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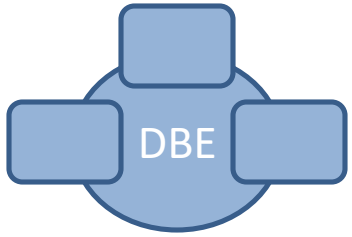
declare **@d1 date**
declare **@d2 date**
set **@d1='03/14/1979'**
set **@d2='12/18/2017'**

declare **@y int**
set **@y=DATEDIFF(YEAR,@d1,@d2)**

declare **@m int**
set **@m=DATEDIFF(MONTH,@d1,@d2)**

declare **@d int**
set **@d=DATEDIFF(DAY,@d1,@d2)**




@d1

1979-03-14

@d2

2017-12-18

@y

**38**

@m

**465**

@d

**14159**

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# date time functions lab-1

- write a program for adding 8 years 3 months and10 days to current date and display the resultant date?
- write a program for displaying difference between two dates in terms of total days difference, total months difference and total years difference.

```
declare @date1 date;
declare @date2 date;
set @date1='03-14-1979';
set @date2='12-18-2017';
.............
.............
```

ERS:

| year | months | days |
|---|---|---|
| 38 | 465 | 14159 |

Technologies

# cast and convert functions

cast function is usually used for data type conversions

cast syntax: cast (expression as data _type[(size)]

example:

```
declare @x int;
set @x=10;
declare @y varchar(40);
set @y='palle';
declare @r varchar(40);
 set @r=@x+@y;
-- this code will not work since we can't concatenate int and
    varchar
set @r=cast(@x as varchar(10)) +@y;
--this code will work and @r will get 10palle as its data
```

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# Convert function:

Used for converting one data type into another data type.

**Syntax:** CONVERT (data-type [(size)], expression-or-column-name-or-variable-name [, **style**])

Convert function allows formatting data while converting data. Formatting options are especially useful while using date time conversions and money conversions, since every country and culture having individual date time and money representation.

Ex: IN USA date time format is mm/dd/yyyy, in India allowed date time format is dd-mm-yyyy.

## Few important date time styles:

| Style | Description | Standard |
|---|---|---|
| 0 or 100 | mon dd yyyy hh:miAM (or PM) | Default |
| 1 or 101 | 1 = mm/dd/yy<br>101 = mm/dd/yyyy | U.S. |
| 2 Or 102 | 2 = yy.mm.dd<br>102 = yyyy.mm.dd | ANSI |
| 3 or 103 | 3 = dd/mm/yy<br>103 = dd/mm/yyyy | India/British/French |

Note: usually single digit and double digit style number will display year number without century (ex 15 instead of 2015) except 0, 9, 13, 20 and 21.

Example for convert:

```
declare @x int;
set @x=20;
 declare @y varchar(40);
set @y='palle university';
 set @y=@x+@y;
-- this code will not work since we can't concatenate int and varchar
set @y=convert(varchar(10),@x) +@y;
--this code will work and @y will get its value as 20palle university
```

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# display doj in Indian style from employee table

Query:Select doj convert(varchar(40),doj,103)
from employees

Output:

| Doj |
| --- |
| 23-10-2011 |
| 21-06-2009 |
| …… |

Destination datatype

Indian style:dd/mm/yyyy

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# cast and convert function lab-1

- write a query for displaying the concatenated result of all patient columns data as shown below(must consider this as 2 assignments one by using cast and one by using convert function)?
- ERS:

| patient detail |
| --- |
| pid=1 fname=madhava lname=reddy age=45 bg=o+ve |
| pid=2 fname=abhinav lname=bandra age=45 bg=o-ve |
| pid=4 fname=hari lname=kiran age=60 bg=b-ve |
| pid=3 fname=madhava lname=kiran age=52 bg=o+ve |
| NULL |
| pid=6 fname=k_iran lname=kumar age=39 bg=b-ve |
| pid=2 fname=abhinav lname=bandra age=45 bg=o-ve |
| pid=7 fname=mahes%h lname=nambootri age=36 bg=b+ve |
| pid=8 fname=rahul lname=kumar age=46 bg=b-ve |
| pid=9 fname=bharat lname=kumar age=56 bg=b-ve |

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# group by and having clauses

- using group by clause we can group data present in a table based on one or more columns.
- syntax: select column_names_used_in_group_by_clause_or _columns_linked_with_aggregate_functions from table name group by column1,column2,…..

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➢Using group by clause we can group data based on one or more columns

**Syntax:**

select c1 from <Table name>group by c1

**NOTE:**

All Columns specified in select list must be present in group by clause

➢Select c1,c2 from t1 group by c1,c2 ✓

➢Select c1,c2,c3 from t1 group by c1,c2 ✗

➢Select c1,c2,Avg(c3) from t1 group by c1,c2 ✓

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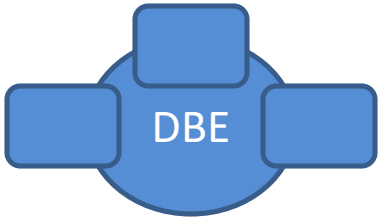
select bg from patients group by bg




FRS

| bg |
|---|
| b+ve |
| o+ve |
| o-ve |
| b-ve |

patient

| P_id | Fname | Lname | age | bg |
|---|---|---|---|---|
| 1 | Madhava | Reddy | 45 | o+ve |
| 4 | Mahadeva | kiran | 52 | o+ve |

| P_id | Fname | Lname | age | bg |
|---|---|---|---|---|
| 2 | Abhinav | bandra | 45 | o-ve |
| 2 | Abhinav | bandra | 45 | o-ve |

| P_id | Fname | Lname | age | bg |
|---|---|---|---|---|
| 3 | Hari | kiran | 60 | b-ve |
| 6 | K_iran | kumar | 39 | b-ve |
| 8 | Rahul | kumar | 46 | b-ve |
| 9 | Bharat | kumar | 56 | b-ve |

| P_id | Fname | Lname | age | bg |
|---|---|---|---|---|
| 7 | Mahes%h | nambotri | 36 | b+ve |

| | P_id | Fname | Lname | age | bg |
|---|---|---|---|---|---|
| ✓ | 1 | Madhava | Reddy | 45 | o+ve |
| ✓ | 2 | Abhinav | bandra | 45 | o-ve |
| ✓ | 3 | Hari | kiran | 60 | b-ve |
| ✓ | 4 | Mahadeva | kiran | 52 | o+ve |
| ✓ | 6 | K_iran | kumar | 39 | b-ve |
| ✓ | 2 | Abhinav | bandra | 45 | o-ve |
| ✓ | 7 | Mahes%h | nambotri | 36 | b+ve |
| ✓ | 8 | Rahul | kumar | 46 | b-ve |
| ✓ | 9 | Bharat | kumar | 56 | b-ve |

# having clause

- having clause is used to filter records which are produced by group by clause
- as we cannot use aggregate function in where clause in that place we will use having clause

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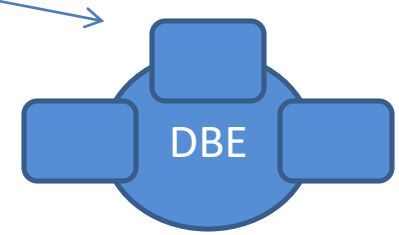
# select bg from patients group by bg having avg(age)>40

FRS

| bg |
|---|
| o+ve |
| o-ve |
| b-ve |

| P_id | Fname | Lname | age | bg |
|---|---|---|---|---|
| 1 | Madhava | Reddy | 45 | o+ve |
| 4 | Mahadeva | kiran | 52 | o+ve |

✓ Avg(age)>40




| P_id | Fname | Lname | age | bg |
|---|---|---|---|---|
| 2 | Abhinav | bandra | 45 | o-ve |
| 2 | Abhinav | bandra | 45 | o-ve |

✓ Avg(age)>40

patient

| P_id | Fname | Lname | age | bg |
|---|---|---|---|---|
| 3 | Hari | kiran | 60 | b-ve |
| 6 | K_iran | kumar | 39 | b-ve |
| 8 | Rahul | kumar | 46 | b-ve |
| 9 | Bharat | kumar | 56 | b-ve |

✓ Avg(age)>40

| P_id | Fname | Lname | age | bg |
|---|---|---|---|---|
| 7 | Mahes%h | nambotri | 36 | b+ve |

✗ Avg(age)>40

| P_id | Fname | Lname | age | bg |
|---|---|---|---|---|
| 1 | Madhava | Reddy | 45 | o+ve |
| 2 | Abhinav | bandra | 45 | o-ve |
| 3 | Hari | kiran | 60 | b-ve |
| 4 | Mahadeva | kiran | 52 | o+ve |
| 6 | K_iran | kumar | 39 | b-ve |
| 2 | Abhinav | bandra | 45 | o-ve |
| 7 | Mahes%h | nambotri | 36 | b+ve |
| 8 | Rahul | kumar | 46 | b-ve |
| 9 | Bharat | kumar | 56 | b-ve |

# group by lab - 1

- select bg, count(*) as ‘count’ from patient group by bg?

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# group by lab-2

- what is the output for the following query(must show all Intermediate groups created by dbe)?

  select * from patient group by bg

- what is the output for the following query(must show all Intermediate groups created by dbe)?

  select bg from patient group by bg

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# group by lab-3

- identify the output for the following query(must show all Intermediate groups created by dbe)?

```
select max(age) as 'max age',bg from patient group by bg
```

- identify the output for the following two queries(must show  all intermediate groups created by dbe where ever required)?

```
select * from patient group by bg,lname

select lname,MIN(age) from patient group by bg,lname
```

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# group by lab-4

- write a Program for displaying all youngest patients fullname for each blood group?
- ERS:

| full name |
| --- |
| abhinavbandra |
| k_irankumar |
| madhavareddy |
| mahes%hna... |

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# group by with having lab-1

- identify the output  for the following query?

```
select bg,MAX(age) as 'max age' from patient group by bg having MAX(age)>40
```

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# subqueries

- a subquery is a query which is usually written inside insert/update/delete/select statement
- usually inner query or sub query must be a select statement and outer query can be any t-sql statement
- sub queries usually used for identifying unknown value and the same will be substituted into outer query

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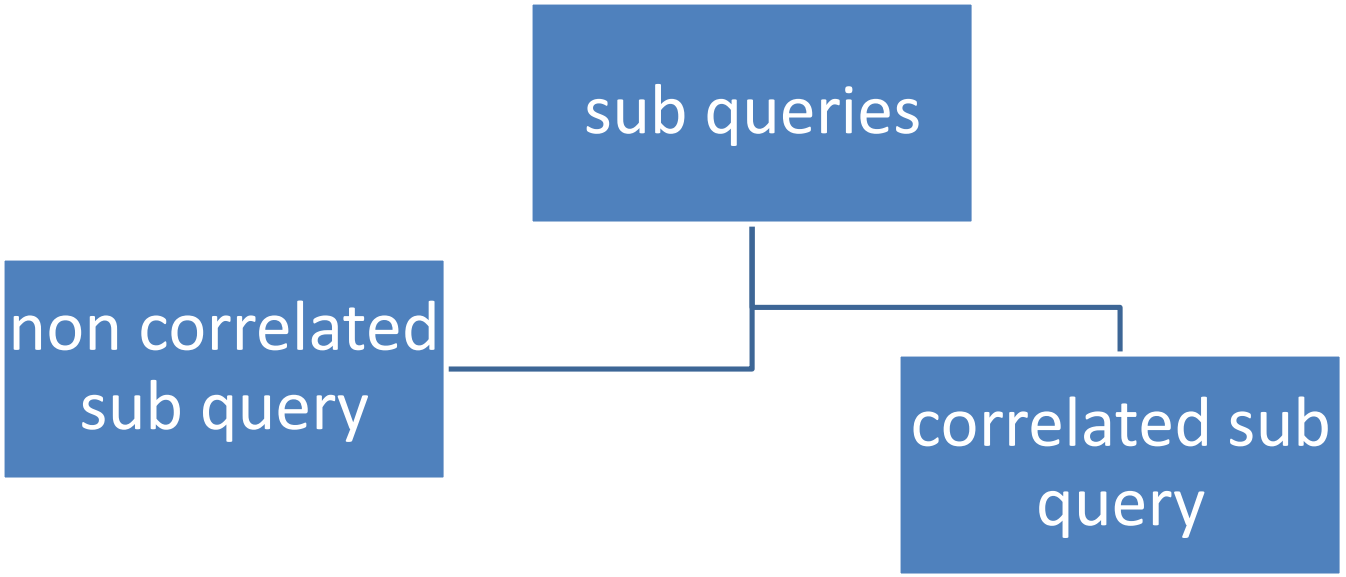


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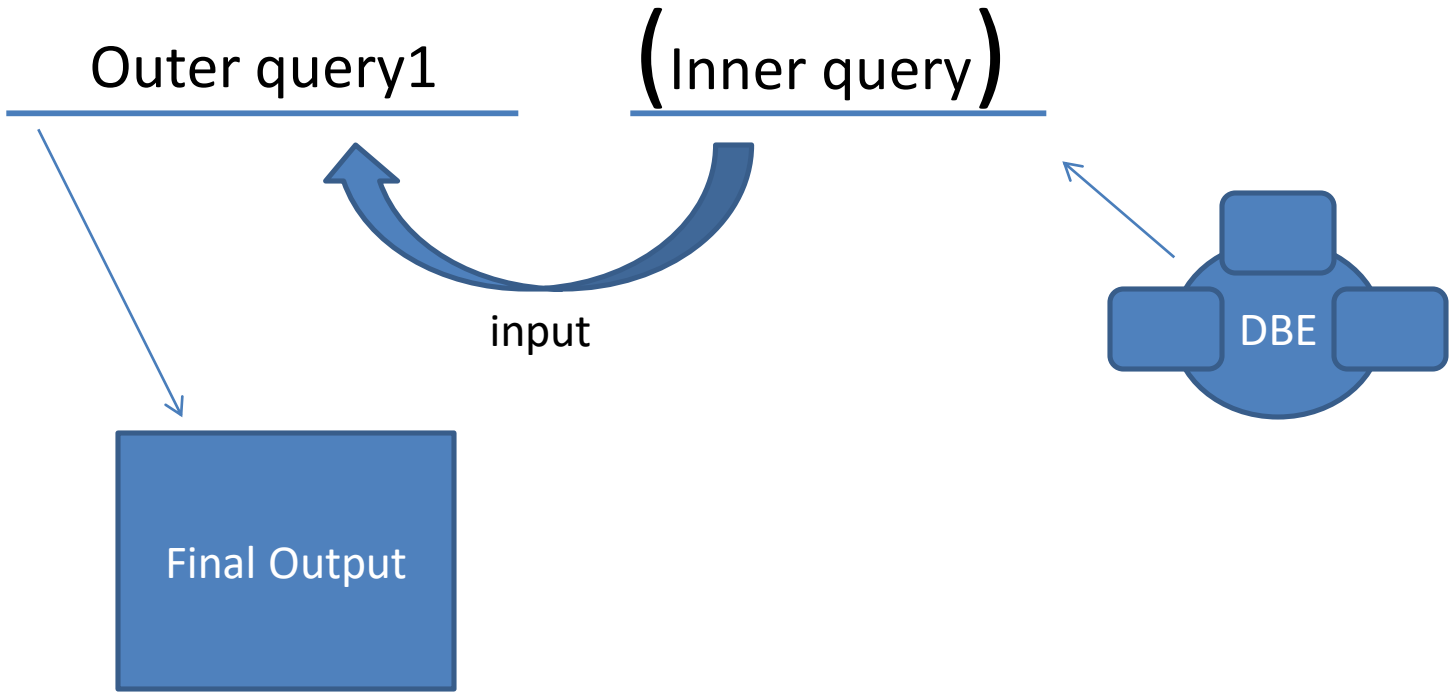
# Non-correlated  sub query

- In a non-correlated subquery , the innermost query is executed first.

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# non-correlated subquery samples.

- Display fullnames of employees whose bg is same as fourth patient's bg.
- Display all employees whose salary is greater than 'db' departments average salary.
- Display all employees whose salary is between

Highest paid '.net' dept employee's salary and least paid db dept employee's salary.

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# non correlated sub queries lab-1

- write a query for displaying all patient details whose age is greater the age of third patient(pid=3)
- write a query for displaying all patient details whose bg is same as 6$^{th}$ patient's bg.
- write a query for displaying all patient details whose age is not same as 1$^{st}$ patients age and 3$^{rd}$ patients age and 9$^{th}$ patient's age
- find the output for the following query?

  select * from patient where age=(select age from patient where pid in (1,3,6))

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# correlated sub query

- correlated sub query is a type of sub query where the inner query depends on outer query for its results.

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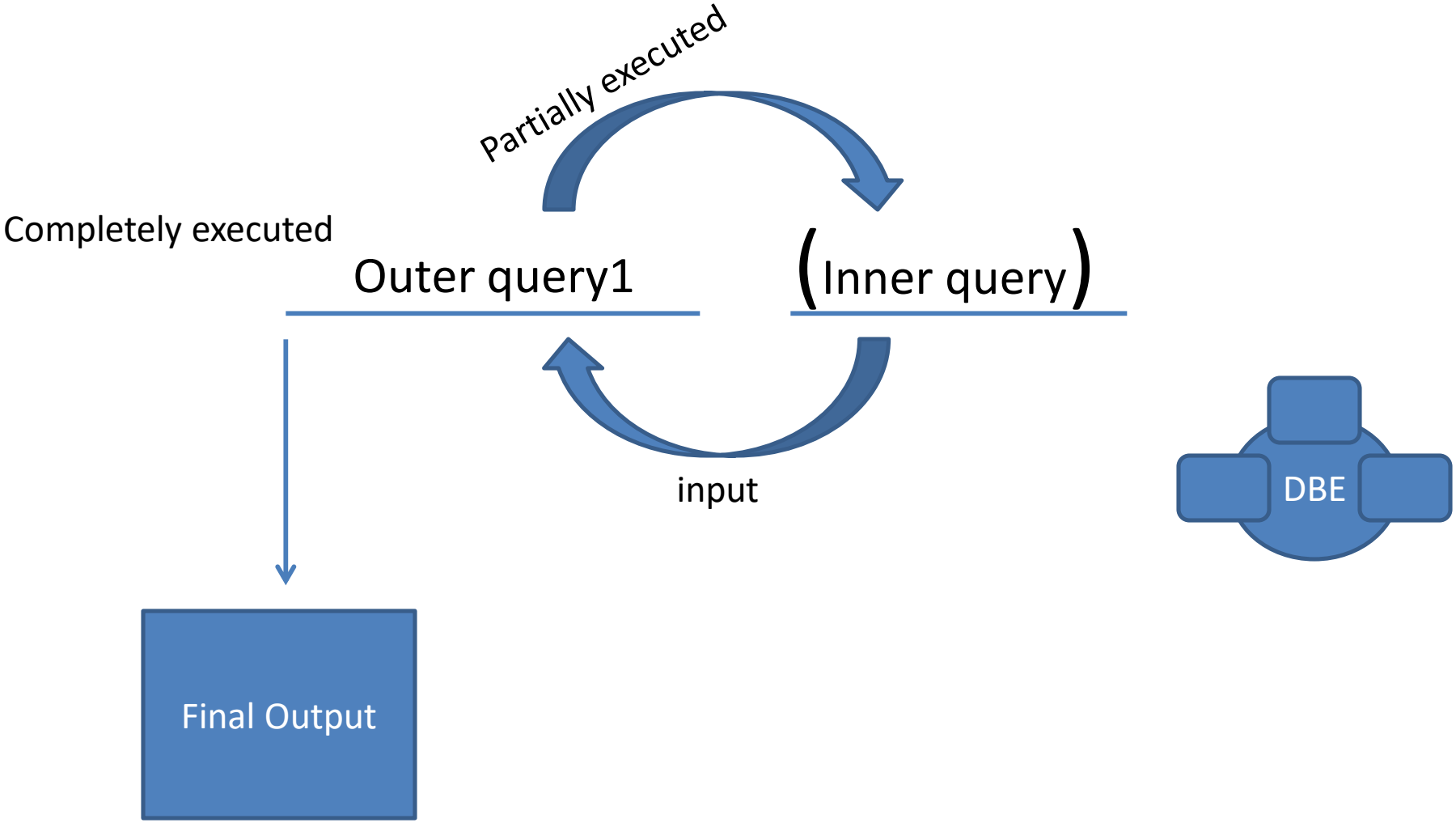
# correlated sub query internals

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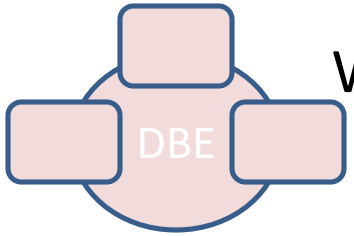
# correlated sub query sample

**select t1.* from t100 t1 where 1=(select count(*) from t100 t2 where t1.c3<t2.c3)**




Where 1 = 1 ☑

When no values are greater than the current value, then the current value is the highest value

Similarly, when there is only one value greater than the current value, then the current value is second highest

Final result set

| c1 | c2 | c3 |
|---|---|---|
| 3 | DD | 170 |

| c1 | c2 | c3 |
|---|---|---|
| 10 | AA | 160 |
| 20 | BB | 90 |
| 3 | DD | 170 |
| 4 | HH | 280 |

t100 t1

| c1 | c2 | c3 |
|---|---|---|
| 10 | AA | 160 |
| 20 | BB | 90 |
| 3 | DD | 170 |
| 4 | HH | 280 |

Display the record which is having second highest value In c3 column

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# Correlated sample 2

| eid | fname | lname | age | salary | dept | doj |
|---|---|---|---|---|---|---|
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |
| 2 | sowmya | kumari | 23 | 19000 | db | 2010-11-13 |
| 3 | kishore | kumar | 27 | 36000 | android | 2011-10-16 |
| 4 | abimanyu | biswal | 22 | NULL | android | 2010-02-20 |
| 5 | soni | kumar | 24 | 21800 | .net | 2009-06-21 |
| 6 | anu | _singh | 22 | 12000 | db | 2010-10-23 |
| 7 | _dinesh | moh%anty | 23 | 15000 | .net | 2009-08-26 |
| 8 | nishala | _kumari | 22 | 18000 | db | 2008-07-19 |
| 1 | rajeev | sukla | 23 | 12000 | .net | 2011-10-23 |

employee

Display second highest salary

**select salary from employee e1 where 1=**

**(select count(*) from employee e2 where  e2.salary>e1.salary)**

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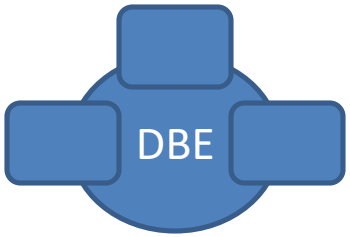
# Query execution

**select salary from employee e1 where 1 =**

**(select count(*) from employee e2 where  e1.salary<e2.salary)**




e1.salary

<

e2.salary

| salary |
|---|
| 12000 |
| 19000 |
| 36000 |
| NULL |
| 21800 |
| 12000 |
| 18000 |
| 15000 |
| 12000 |

| salary |
|---|
| 12000 |
| 19000 |
| 36000 |
| NULL |
| 21800 |
| 12000 |
| 18000 |
| 15000 |
| 12000 |

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| salary |
|---|
| 21800 |

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# correlated sub query

- identify the output for the following query (and also write detailed analysis for the same)?

  select p1.* from patient p1 where 3=( select count(p2.pid) from patient p2 where p2.age>p1.age)

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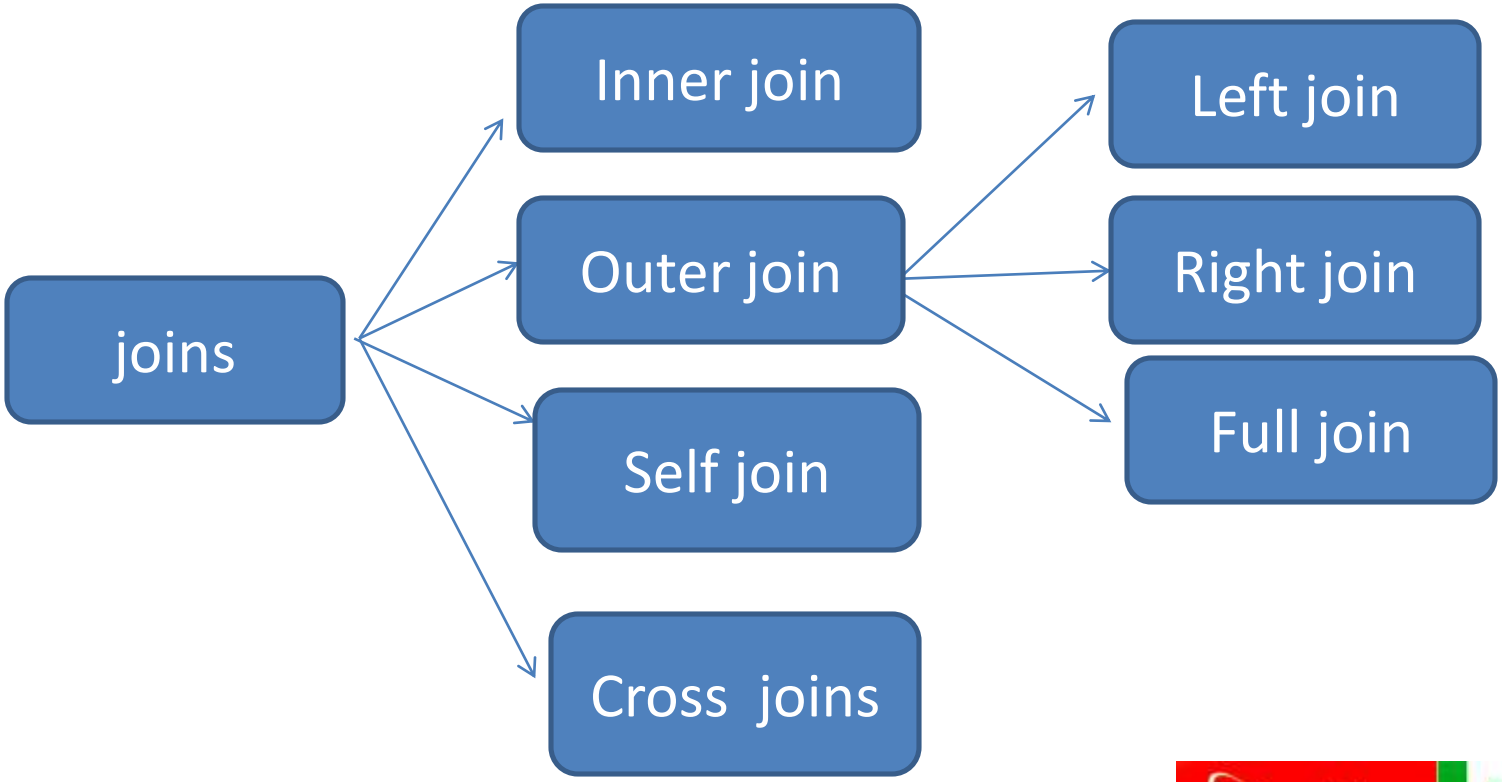
# Joins

- using joins we can fetch data from one or more tables into a result set.

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# inner join

- In inner joins only the matched records(based on condition) from left side table and right side table are added to result set
- **syntax:**

_____left_table_name alias1 inner join/join right_table_name alias2 on<condition>

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Inner join/ join sample

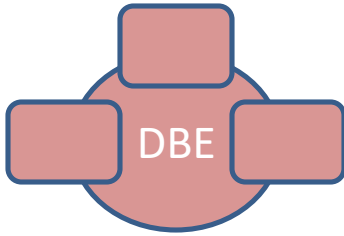
Patient1 p

| pid | name | bg_id | age |
|---|---|---|---|
| 1 | madhav | 1 | 24 |
| 2 | hari | 2 | 27 |
| 3 | kiran | 1 | 21 |
| 4 | raj | 3 | 29 |

Bg b

| id | bg |
|---|---|
| 1 | o+ve |
| 2 | o-ve |
| 3 | b+ve |
| 4 | b-ve |
| 5 | ab-ve |

```
select p.name,b.bg,p.age from patient1 p  join bg b  on p.bg_id=b.id
```




Final result set

| name | bg | age |
|---|---|---|
| madhav | o+ve | 24 |
| hari | o-ve | 27 |
| kiran | o+ve | 21 |
| raj | b+ve | 29 |

**ERS**

| name | bg | age |
|---|---|---|
| madhav | o+ve | 24 |
| kiran | o+ve | 21 |
| hari | o-ve | 27 |
| raj | b+ve | 29 |

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# left outer join

In a left outer join , all the data from left side table will be included in the result set ,And only the matched records from the right side table is included to result set .

Wherever there are no match in the right side table , null values are included in the result set

SYNTAX:

Left_table_name alias _name **left outer join** right_table_name alias_name on <condition>

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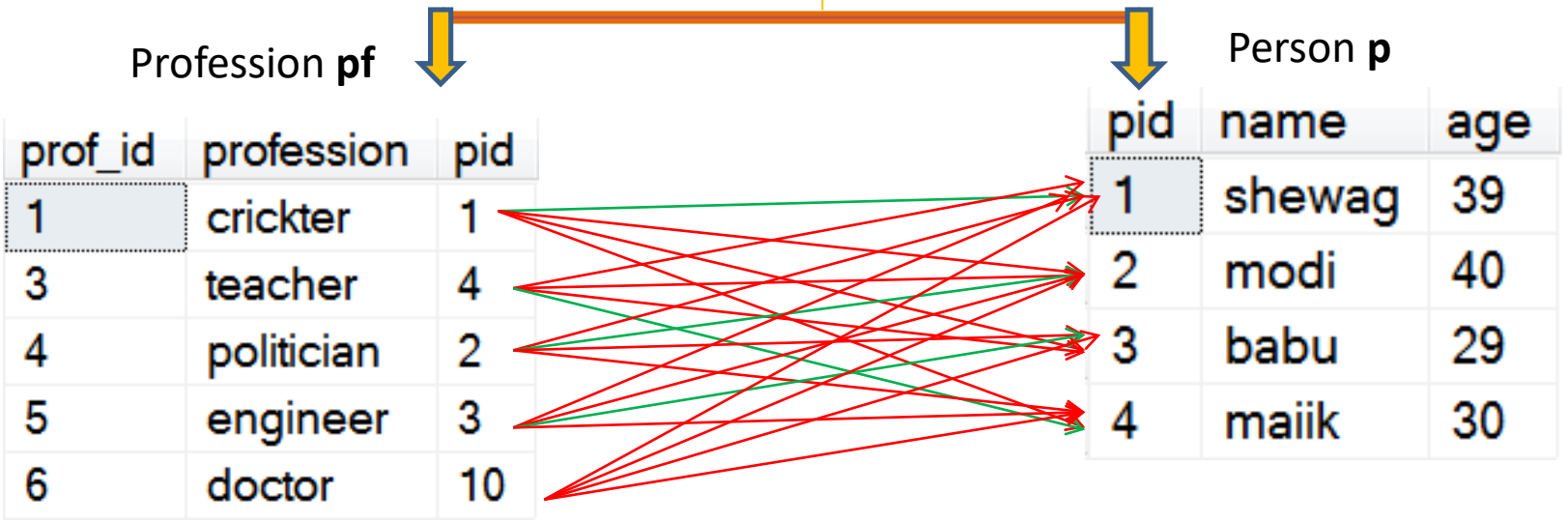


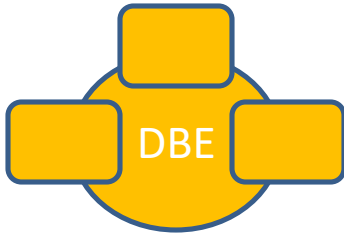

| prof_id | profession | pid |
|---|---|---|
| 1 | crickter | 1 |
| 3 | teacher | 4 |
| 4 | politician | 2 |
| 5 | engineer | 3 |
| 6 | doctor | 10 |

| pid | name | age |
|---|---|---|
| 1 | shewag | 39 |
| 2 | modi | 40 |
| 3 | babu | 29 |
| 4 | maiik | 30 |

Select **pf.* , p.* from profession pf left outer join person p on pf.pid = p.pid**

**Final result set**

| prof_id | profession | pid | pid | name | age |
|---|---|---|---|---|---|
| 1 | crickter | 1 | 1 | shewag | 39 |
| 3 | teacher | 4 | 4 | maiik | 30 |
| 4 | politician | 2 | 2 | modi | 40 |
| 5 | engineer | 3 | 3 | babu | 29 |
| 6 | doctor | 10 | NULL | NULL | NULL |



In left outer join, all left table data must be added to result set

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# right outer join

In a right outer join , all the data from right side table will be included in the result set ,And only the matched records from the left side table is included to result set .

Wherever there are no match in the left side table , null values are included in the result set

SYNTAX:

Left_table_name alias _name **right outer join** right_table_name alias_name on <condition>

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country c

| id | name | NAid |
|---|---|---|
| 1 | USA | 4 |
| 2 | India | 1 |
| 3 | Australia | 5 |

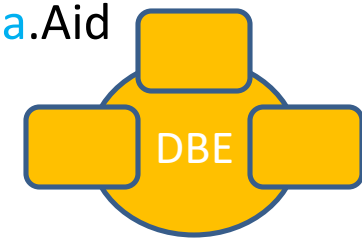
animal a

| Aid | Aname |
|---|---|
| 1 | Tiger |
| 2 | Bear |
| 3 | Tortoise |
| 4 | BaldEagle |
| 5 | kangaroo |

?? Bear will be added to resultset or not

**Req:** Now I would like to display **all animal names** along with country names if any **matching countries** are present

select c.name, a.aname from country c right join animal a on c.NAid=a.Aid




Final result set

| name | aname |
|---|---|
| India | Tiger |
| NULL | Bear |
| NULL | Tortoise |
| USA | BaldEagle |
| Australia | kangaroo |

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# Full outer join

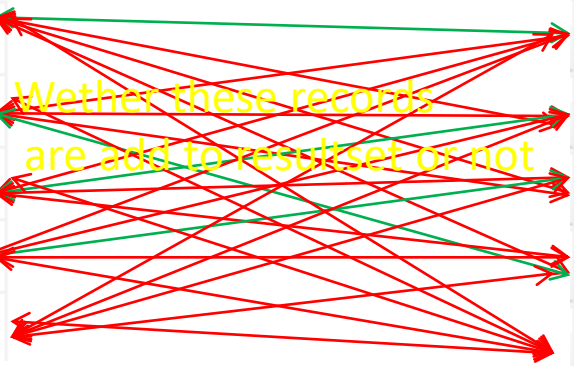
In case of full outer join all data from both the tables will be added to the result set , irrespective of the condition, Wherever there are no match , null values are included

Profession **pf**

| prof_id | profession | pid |
|---|---|---|
| 1 | crickter | 1 |
| 3 | teacher | 4 |
| 4 | politician | 2 |
| 5 | engineer | 3 |
| 6 | doctor | 10 |

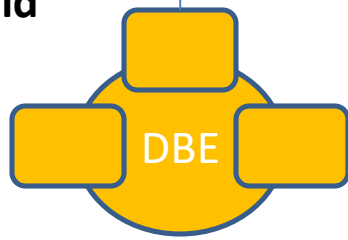
Person **p**

| pid | name | age |
|---|---|---|
| 1 | shewag | 39 |
| 2 | modi | 40 |
| 3 | babu | 29 |
| 4 | maiik | 30 |
| 5 | mahesh | 28 |




Select pf.* , p.* **from profession pf full outer join person p on p.pid=pf.pid**

| prof_id | profession | pid | pid | name | age |
|---|---|---|---|---|---|
| 1 | crickter | 1 | 1 | shewag | 39 |
| 3 | teacher | 4 | 4 | maiik | 30 |
| 4 | politician | 2 | 2 | modi | 40 |
| 5 | engineer | 3 | 3 | babu | 29 |
| 6 | doctor | 10 | NULL | NULL | NULL |
| NULL | NULL | NULL | 5 | mahesh | 28 |

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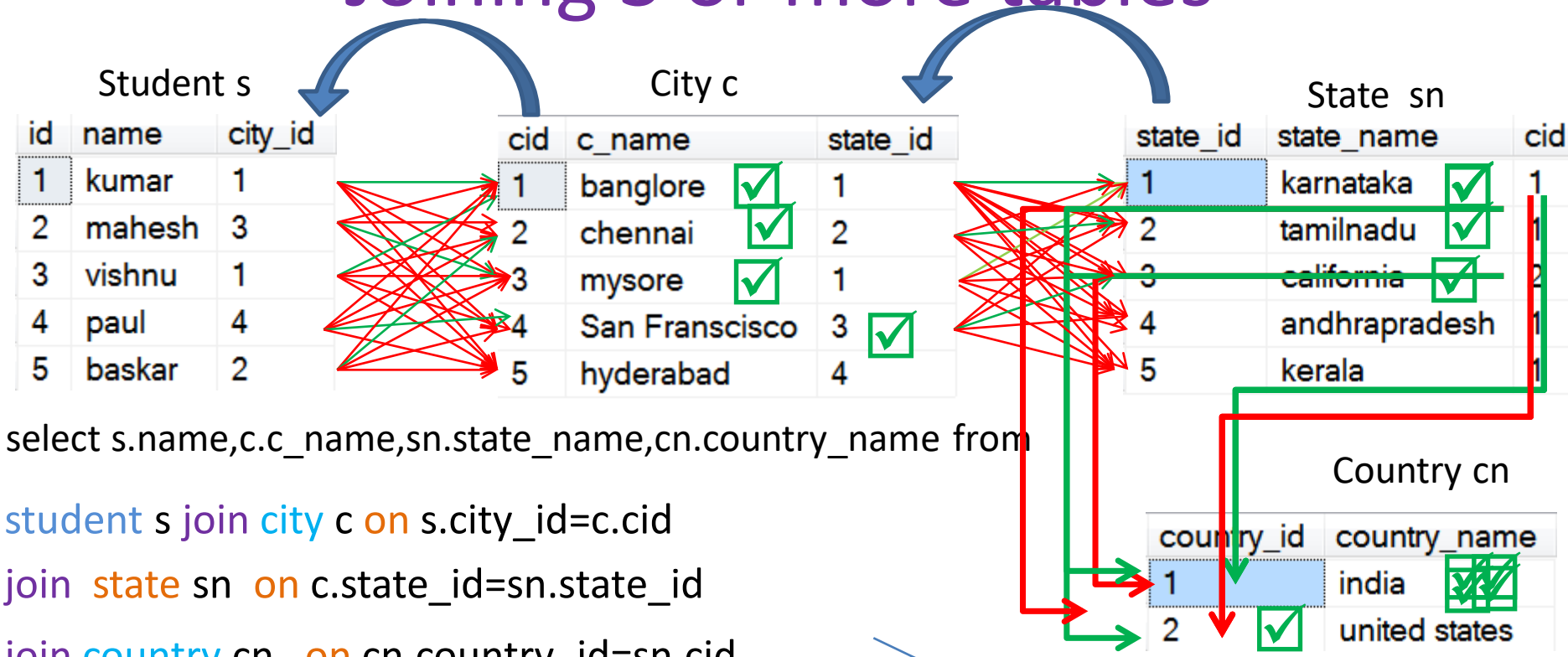
# Joining 3 or more tables




Student s

| id | name | city_id |
|---|---|---|
| 1 | kumar | 1 |
| 2 | mahesh | 3 |
| 3 | vishnu | 1 |
| 4 | paul | 4 |
| 5 | baskar | 2 |

City c

| cid | c_name | state_id |
|---|---|---|
| 1 | banglore | 1 |
| 2 | chennai | 2 |
| 3 | mysore | 1 |
| 4 | San Franscisco | 3 |
| 5 | hyderabad | 4 |

State sn

| state_id | state_name | cid |
|---|---|---|
| 1 | karnataka | 1 |
| 2 | tamilnadu | 1 |
| 3 | california | 2 |
| 4 | andhrapradesh | 1 |
| 5 | kerala | 1 |

Country cn

| country_id | country_name |
|---|---|
| 1 | india |
| 2 | united states |

```
select s.name,c.c_name,sn.state_name,cn.country_name from
student s join city c on s.city_id=c.cid
join  state sn  on c.state_id=sn.state_id
join country cn   on cn.country_id=sn.cid
```

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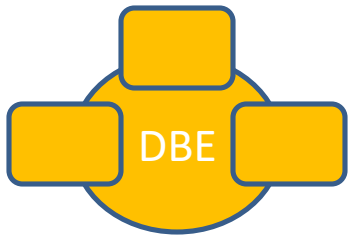
| name | c_name | state_name | country_name |
|---|---|---|---|
| kumar | banglore | karnataka | india |
| mahesh | mysore | karnataka | india |
| vishnu | banglore | karnataka | india |
| paul | San Franscisco | california | united states |
| baskar | chennai | tamilnadu | india |

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# cross join

- A cross join with where clause will produce same result as inner join
- A cross join without where clause will produce the cartesian products of the tables which are involved in join
- We must use cross join keyword for cross join
- use where clause for specifying cross join condition

**NOTE :**

**Must not use ON keyword for specifying cross join condition**

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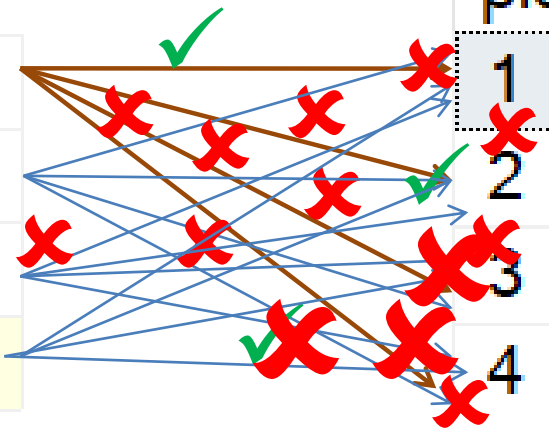
profession

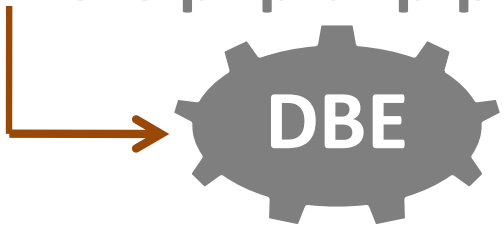
| SiNo | profession | pid |
|---|---|---|
| 1 | Cricketer | 1 |
| 3 | teacher | 4 |
| 4 | Politician | 2 |
| 5 | scientist | NULL |



person

| pid | name | age |
|---|---|---|
| 1 | sehwag | 39 |
| 2 | modi | 40 |
| 3 | babu | 29 |
| 4 | malik | 30 |

**Select p.*,pf.* from person p cross join profession pf where pf.pid=p.pid**




**FRS**

| SiNo | profession | pid | pid | name | age |
|---|---|---|---|---|---|
| 1 | Cricketer | 1 | 1 | sehwag | 39 |
| 3 | teacher | 4 | 4 | malik | 30 |
| 4 | Politician | 2 | 2 | modi | 40 |

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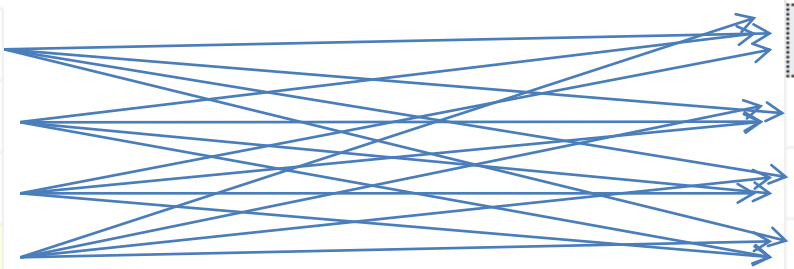
# Cross join without where clause

**profession**

| SiNo | profession | pid |
|---|---|---|
| 1 | Cricketer | 1 |
| 3 | teacher | 4 |
| 4 | Politician | 2 |
| 5 | scientist | NULL |



**person**

| pid | name | age |
|---|---|---|
| 1 | sehwag | 39 |
| 2 | modi | 40 |
| 3 | babu | 29 |
| 4 | malik | 30 |

## Select pf.*, p.* from person p cross join profession pf

| pid | name | age | sino | profession | pid |
|---|---|---|---|---|---|
| 1 | crickter | 1 | 1 | shewag | 39 |
| 1 | crickter | 1 | 2 | modi | 40 |
| 1 | crickter | 1 | 3 | babu | 29 |
| 1 | crickter | 1 | 4 | maiik | 30 |
| 3 | teacher | 4 | 1 | shewag | 39 |
| 3 | teacher | 4 | 2 | modi | 40 |
| 3 | teacher | 4 | 3 | babu | 29 |
| 3 | teacher | 4 | 4 | maiik | 30 |
| 4 | politician | 2 | 1 | shewag | 39 |
| 4 | politician | 2 | 2 | modi | 40 |
| 4 | politician | 2 | 3 | babu | 29 |
| 4 | politician | 2 | 4 | maiik | 30 |

| | | | | | |
|---|---|---|---|---|---|
| 5 | scientist | NULL | 1 | shewag | 39 |
| 5 | scientist | NULL | 2 | modi | 40 |
| 5 | scientist | NULL | 3 | babu | 29 |
| 5 | scientist | NULL | 4 | maiik | 30 |

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# self join

- joining a table to itself called as self join
- we use inner join for self join ( no special keyword for self join )
- we must use different alias names for same table while comparing same table with itself

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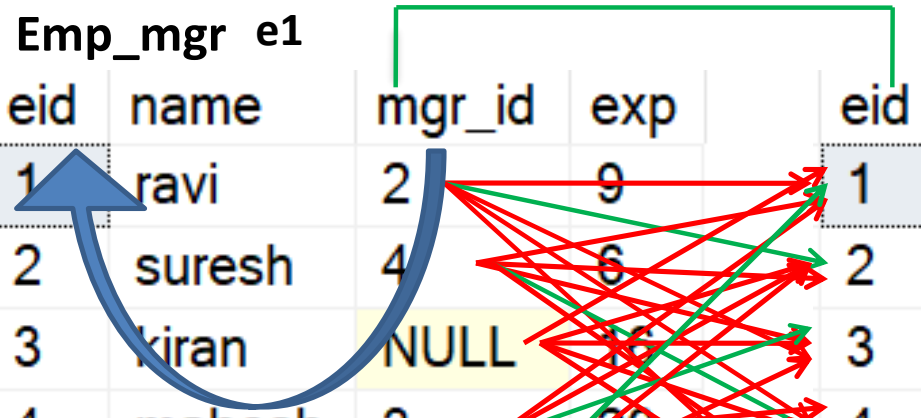
**Emp_mgr e1**

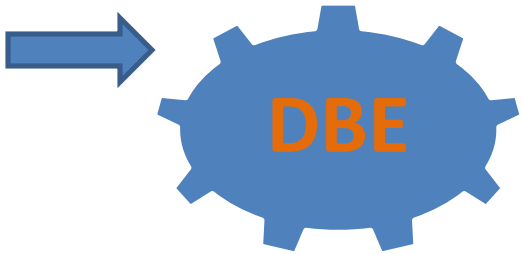
| eid | name | mgr_id | exp |
|---|---|---|---|
| 1 | ravi | 2 | 9 |
| 2 | suresh | 4 | 6 |
| 3 | kiran | NULL | 16 |
| 4 | mahesh | 3 | 26 |
| 5 | hari | 1 | 3 |

**Emp_mgr e2**

| eid | name | mgr_id | exp |
|---|---|---|---|
| 1 | ravi | 2 | 9 |
| 2 | suresh | 4 | 6 |
| 3 | kiran | NULL | 16 |
| 4 | mahesh | 3 | 26 |
| 5 | hari | 1 | 3 |



```
select e1.name as 'employee',e2.name as 'manager' from emp_mgr e1
join emp_mgr e2 on e1.mgr_id=e2.eid
```




| employee | manager |
|---|---|
| ravi | suresh |
| suresh | mahesh |
| mahesh | kiran |
| hari | ravi |

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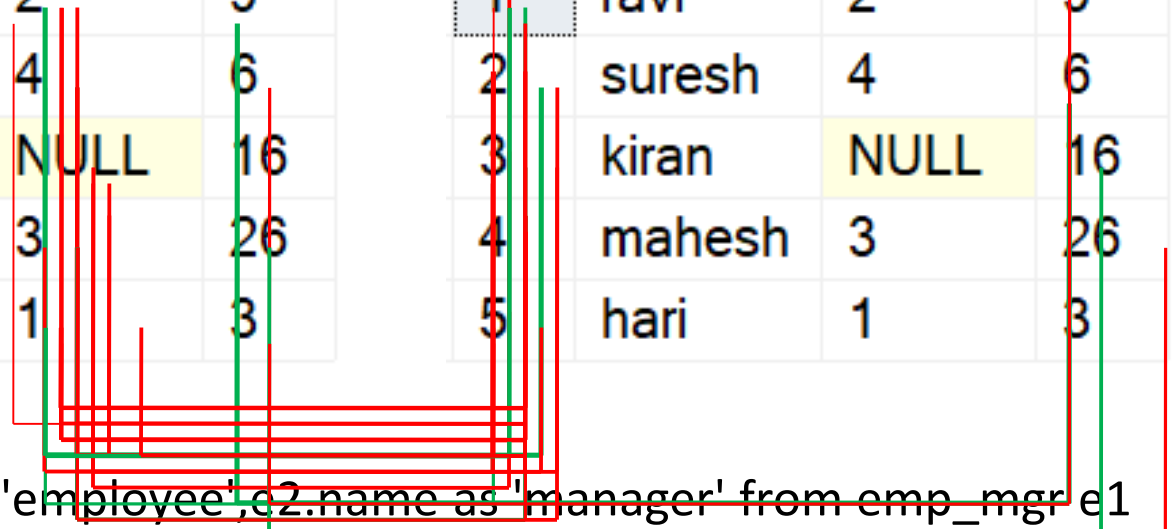
**Req**: display all employee and manager names , where the employee's experience are greater than their managers

**Emp_mgr e1**

| eid | name | mgr_id | exp |
|---|---|---|---|
| 1 | ravi | 2 | 9 |
| 2 | suresh | 4 | 6 |
| 3 | kiran | NULL | 16 |
| 4 | mahesh | 3 | 26 |
| 5 | hari | 1 | 3 |

**Emp_mgr e2**

| eid | name | mgr_id | exp |
|---|---|---|---|
| 1 | ravi | 2 | 9 |
| 2 | suresh | 4 | 6 |
| 3 | kiran | NULL | 16 |
| 4 | mahesh | 3 | 26 |
| 5 | hari | 1 | 3 |



```
select e1.name as 'employee',e2.name as 'manager' from emp_mgr e1
join emp_mgr e2 on e1.mgr_id=e2.eid and e1.exp>e2.exp
```

| employee | manager |
|---|---|
| ravi | suresh |
| mahesh | kiran |

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# ask students to find output

T1

| c1 | c2 | c3 |
|---|---|---|
| 10 | AA | 6 |
| 20 | BB | 80 |
| 30 | CC | 260 |
| 4 | DD | -60 |

T1

T2

| c4 | c5 |
|---|---|
| 1 | RR |
| 20 | JJ |
| 60 | KL |
| 4 | NM |

T2

```
select t1.* ,t2.* from T1 t1 inner join T2 t2 on t1.c3>t2.c4

select t1.* ,t2.* from T1 t1 inner join T2 t2 on t1.c1!=t2.c4

select t1.* ,t2.* from T1 t1 left outer join T2 t2 on t1.c1!=t2.c4

select t1.* ,t2.* from T1 t1 right outer join T2 t2 on t1.c1!=t2.c4

select t11.* , t1.* from T1 t11 join T1 t1 on 3*t11.c3<t1.c1
```

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# tables required for joins lab

| fp_id | f_name | l_name | state_id |
|---|---|---|---|
| 1 | apj | abdul kalam | 2 |
| 2 | nr | narayana murthy | 1 |
| 3 | ratan | tata | 5 |

famous_people

| s_id | s_name |
|---|---|
| 1 | Karnataka |
| 2 | Tamilnadu |
| 3 | Uttar Pradesh |
| 4 | Madhya Pradesh |
| 5 | Maharashtra |

state

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# inner joins lab-1

- identify the output for the following queries?

```
select  fp.f_name, fp.l_name, s.s_name from famous_people fp
inner join state s on fp.state_id=s.s_id
```

```
select  fp.f_name, fp.l_name, s.s_name from famous_people fp
inner join state s on fp.state_id!=s.s_id
```

```
select  fp.f_name+' '+fp.l_name+ ' is not from '+  s.s_name as 'result'
from famous_people fp inner join state s on fp.state_id!=s.s_id
```

```
select  fp.f_name, fp.l_name, s.s_name from famous_people fp
inner join state s on len(fp.f_name)>s.s_id
```

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# outer joins

- identify the output for the following queries?

```
select  fp.f_name, fp.l_name, s.s_name from famous_people fp
left join state s on fp.state_id=s.s_id
```

```
select  fp.f_name, fp.l_name, s.s_name from famous_people fp
right join state s on fp.state_id=s.s_id
```

```
select  fp.f_name, fp.l_name, s.s_name from famous_people fp
right join state s on fp.state_id>s.s_id
```

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# self joins lab-1

| eid | name | mgr_id | exp |
|---|---|---|---|
| 1 | ravi | 2 | 9 |
| 2 | suresh | 4 | 6 |
| 3 | kiran | NULL | 16 |
| 4 | mahesh | 3 | 26 |
| 5 | hari | 1 | 3 |

employee_manager

- write a query for finding all employee names whose exp is greater than their managers exp?
- write a query for displaying all employee names along with their manager names if any (the result set must also contain kiran)

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# stored procedures

- stored procedure is almost same as function/method in normal programming languages.
- a stored procedure is a compiled query **(query whose execution plan is cached)**
- a sp can take 0 or more inputs and can return 0 or more out puts.

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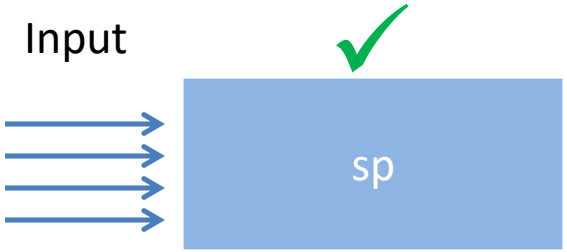
# Types of stored procedures



**Output:**

1) **Using select statements**
2) **Output parameters**
3) **Return statement**

**Note:** we can return only integer values using return statement

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# SP Syntax

**Syntax:**

```
Create proc\procedure<proc name>
(
@vn datatype[(size)],
@vn datatype[(size)],
---------------
)
as
begin
------------ any conditional statements/ loops / variables....
T-sql statements(dql\ddl\dml\tcl)
------------
end
```

**Calling sp:**

```
exec spname_____,_________,_______.....
```

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# Stored Procedure sample

- write a sp with the name getpatient to get all patient details from table

```
Create procedure getpatient
As
Begin
Select * from patient
end
```

**Calling sp:**

```
exec getpatient
```

**output**

| | pid | fname | lname | age | bg |
|---|---|---|---|---|---|
| 1 | 1 | Madhava | Reddy | 45 | O+ve |
| 2 | 2 | Abhinav | ban... | 45 | O-ve |
| 3 | 4 | Hari | Kiran | 60 | B-ve |
| 4 | 3 | Madhava | Kiran | 52 | O+ve |
| 5 | 5 | veena | kum... | 42 | NULL |
| 6 | 6 | K_iran | Kum... | 39 | B-ve |
| 7 | 2 | Abhinav | ban... | 45 | O-ve |
| 8 | 7 | Mahes... | Nam... | 36 | B+ve |
| 9 | 8 | Rahul | Kum... | 46 | B-ve |
| 10 | 9 | bharat | Kum... | 56 | B-ve |

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# Stored Procedure sample 2

- write a sp with the name insertemployee for inserting new employee into employee table (the sp must take @eid, @fn, @ln, @age,@sal,@dept and @doj as input parameters)

```
create proc insertemp1
(
@eid int,@fn varchar(40),@ln varchar(40),@age int,
@sal int,@dept varchar(40),@doj date
)
as
begin
insert into employees01 values(@eid,@fn,@ln,@age,@sal,@dept,@doj)
end
```

**Calling sp:**

```
exec insertemp1 10,'harish','rao',45,23100,'android','10-05-2014'
```

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# Stored Procedure Lab-1

- write a sp with the name insertpatient for inserting new patient into patient table (the sp must take @pid, @fn, @ln, @age and @bg as input parameters)

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# User defined function

- User defined function is similar to a stored procedure
- User defined function contains set of compiled t-sql statements (which is similar to stored procedures)
- User defined functions supports only input parameters but not output parameters
- An udf can’t contain any t-sql statements which alters current state of data base.
- User defined function is not allowed to call any stored procedure

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# udf vs sp

| SP | UDF |
| --- | --- |
| Supports input & output parameters | Supports only input parameters |
| Can write any type of sql queries | Can’t write sql queries which modifies state of db ( ex. insert/update/delete/create etc..) |
| Sp can call UDF | Udf can’t call sp |

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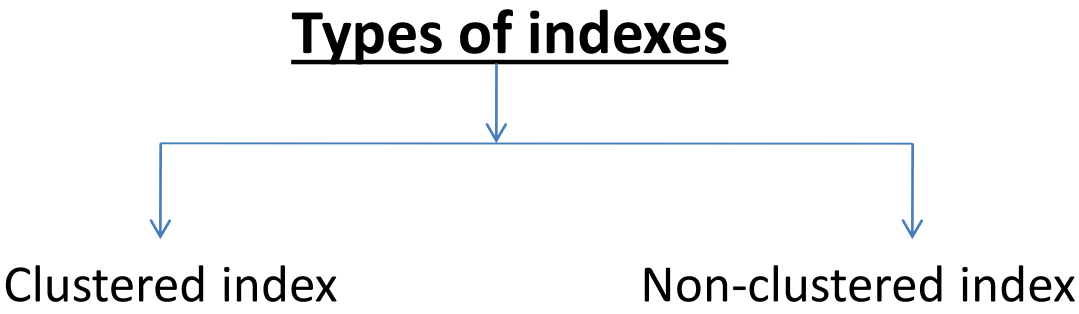
# indexes

- using indexes we can quickly find the information from a table or from an indexed view




clustered index

- In a clustered index , the actual table is stored in the leaf pages of b-tree *[binary tree]*
- Only 1 clustered index is possible per table

syntax :-

create clustered index <index_name> on <table_name> (column1,column2..)

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