

Date :

No:

## SESSION 5

- \* Using join when you select from more than one table
- \* Joins make filteration

### ① Cross join (Cartesian Product)

If you have Tables

$$\{A, B, C\} * \{X, Y\}$$

أيضاً كذا مفهوم

A, X  
A, Y  
B, X  
B, Y  
C, X  
C, Y

Select E.Name, D.Name  
From Employee E, Departments D

ستحصل على

لتحصل على 2 columns

16 = 4 \* 4 records

Department		Employee		
ID	Name	ID	Name	DeptID
10	Sales	1	Ahmed	10
20	IS	2	Aya	10
30	HR	3	Ali	20
40	AI	4	Osama	NULL

### Result

E.name D.name

Ahmed Sales

Ahmed IS

Ahmed HR

Ahmed AI

4 \* 4 = 16 Records

Date : 10/12/2023  
① DB → DBobject → Function

\* by using fun code → reusability  
→ Maintainability

First way to write cross join

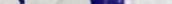
Select E-name , D.name

From Employee E, Department D

~~Hand~~ I will hand back my ~~book~~ in my ~~answ~~ **Ansi**

Select E.name, D.name

From Employee E Crossjoin Department D

② Inner Join (Equal join) 

Get columns achieve Match only

Select E.name , D.name

From Employee E, Department D

where E.DeptID = D.ID

FR-PRD / man Ans

Select E.name , D.name

From Employee E innerJoin Depart D

or join

on E. DEPTID = D.ID

Microsoft

### ③ outer join

have three types

inner join + diff based on type

#### 3.1] left outer join

check left Table (Employee)

+ if there is no match in right table then null values go.

Select E.name, D.name

From Employee E left outer join Depart D

on D.Id = E.DeptId

#### 3.2] Right outer join

check right Table // known as left null (نقي)

Matching null gets the left null values

Null values in right Values is not  
= null, instead consider it as null

Select E.name, D.name

From Depart D right outer join Employee E

on D.Id = E.DeptId

result of left join result

#### 3.3] Full outer join

inner join + set null (ناتج الباقي)

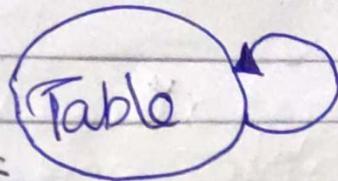
Select E.name, D.name

From Depart D full outer join Employee E

on D.Id = E.DeptId

Date :  
 \* Self Join  $\rightarrow$  Self relationship  
 Special Table From join happen  
 When Table have relation with  
 it self unary

outer or inner join  
 self join one table  
 matches to self join



- using inner join
- outer self join

### Ex] Employees

Id	Name	ManagerId
1	Ahmed	Null
2	Aya	1
3	omar	1

one table (جاري)  
 TwoTables

Employees Many  $\rightarrow$  Managers One

Id	name	M_id	Id	name	M_id
1	Aya	1	1	Ahmed	Null
2	omar	1			
3					

Select E.name, M.name

From Employees E , Employees Manager  
 where Manager.Id = E.M\_id

Date:  
No:

## \* Multiple Tables Join

Student M      M Course



Std-Crs

Table ~~بيانات المدارس~~

Select S.name, C.name, Grade, SC

From Student S, Course C, Std-Crs SC

Where SC.Std.Id = S.Id and  
SC.Crs.Id = C.Id

another ~~example~~ way syntax

Select S.name, C.name, Grade, SC

From Student S inner join Std-Crs SC

on S.Id = SC.Std.Id

inner join Course C  
on C.Id = SC.Crs.Id

Left Condition لازمJoin \*

Right Condition

Date :  
No:

# DML with JOIN

~~insert update delete~~

## ① Join with insert

Insert Into employee (E\_Id, E\_name, D\_Id)  
Query :: In this UI Data II is ID  
select E\_Id, E\_name, D\_Id  
From employee E Join depart D  
on E.deptname = D.deptname  
Where e.Id = 1; Filter J & L S in  
insert del Id=1, its cell ID UI Data II (L)

② Join with update

## order execute

### ③ update sc

Set Grade += Grade \* 0.1

① From Student 5 join Std-crs SC

② On  $S.ID = SC.S+ID$  and

5. address = 'Cairo'

③ Join with delete

③ delete sc

① From Students join std crs sc

② on 5.1d - 8c - 8f - 1d and

5. address = 'Carlo'

المساحات المثلثية وعاليات في القاهرة

# FUNCTIONS

☞ SQL Functions الويهات الويهات  
in developing reusable code  
with clean codes

## TWO TYPES:

① User - Defined

② Built - In

\* Based on return Value

① <sup>in user - Defined Fun</sup> Scalar Valued

Fun return one Value

② Table Valued

Fun returns Table

## \* Built In Fun

① Aggregate Fun

using to make something Math operation on records

IS Scalar Valued

① Count () Take one Parameter  
not null unique or PR/\*  $\leftarrow$  or  $\rightarrow$  column  
Select Count (\*) of table

From EMPLOYEES

Table is used to result get

↳ Value returned not existed in Table.

result in Helped Column II

Date:

No:

Select Count(Salary) as E-Salary  
From Employees

NullValue > Salary (101 records) is Dept

② Sum() Take one Parameter

MUST be numeric

Select Sum(Salary)

From Employees

③ AVG() Same as sum()

One Parameter + Must numeric

$$AVG(Par) = \frac{\text{Sum}(Par)}{\text{Count}(Par)}$$

④ Max() Take one column

MUST numeric

⑤ Min() Same as Max() Fun

Ex

Select Count(\*) as CountofStd  
From Students

② Null Fun

using to can handle values  
IF NULL or replace NULL to  
specific value

① IS NULL

②

### ① IS NULL ( ) Take 1 # of Parameter

Select ISNULL(Fname, 'Noname')  
Check if Fname = null : Fname Noname  
From employee

another way

Select ISNULL(Fname, Lname)  
IF Fname = Null : return Lname

Select ISNULL(Fname, ISNULL(Lname, 'Noname'))  
null او Lname is null → Fname is null  
(so Value if P, Value is Lname if P)  
↓ will be like this if P is true

### ② Coalesce Take any # of Parameter

Select COALESCE(Fname, Lname, 'Noname')  
Some result

### ③ Casting (Conversion) Fun

using to CONVERT FROM 'datatype' to another datatype

① CONVERT() ② CAST() ③ Parse()

④ TRY\_CONVERT() ⑤ TRY\_CAST()

⑥ TRY\_Parse

Date:

## ① Convert()

using to convert from datatype  
to any datatype

Select Fname +

+ Cast

Convert(DataType)

Select Fname +

Convert(Varchar(Max), Age)

Backslash لتحويل DT إلى

إلا إذا كان null : columns لو

+ using

## ② Concat() Take any # of Parameters

Converting all Parameters to String

even if Null إيداعه null will be Mapped  
to Empty String

Select Concat('St-name', Fname, 'Age', Age)

## ③ Cast() Same as Convert With difference in syntax only

String | Date | DateTime allowed

Select (Age)

Select Fname +

Cast(Age as Varchar(10))

لتحويلها إلى مكتوب

إلى المطلوب

Ex] declare @crvDate = '12/04/2023'

Select Convert(Varchar(Max), @crvDate, 102)

→ ستغير المدخلات

format

→ في المخرجات

Date  
Formatting

④ Parse(), using to / convert  
From String to Datetime / NumType

Select Parse('Mon,13 Dec as date')  
String as datetime

\* If you having any error or  
Probabilite to handle using  
Try-Parse, Try-Cast, Try-Convert  
error is null design also is just

## ④ Date Time Fun

١ Get Date ( )  
يسجل الوقت والتاريخ بـاع الوقت  
الى بن في  
Select Date ( )

Select GetDate()

٢ GetUTCDate() يرجى إدخاله في الكود حيث يتم تحويل الميلادي إلى الميلادي

③ Day(s) Take Date, return  
# of Day

Select Day (GetDate())

أو أرقة لاريف المفاردة هترجعى أختاري وكم

④ Month() Take Date return  
# of Month this is 1

## Select Month (Set Date(V))

5 Year(s) take Data sets

⑤ Year() Take Date return year  
Select Year(BetDate())

Date :

## ⑥ DatePart() Take Date

⑤, ④, ③ Year, Month

Select DatePart(day), GetDate()

Day, Month, Year, Week, hour, min, ss---

## ⑦ ISDate() Check if string is Date or not

Select ISDate('Ahmed') # 0 No

Select ISDate(GetDate()) # 1 Yes

## ⑧ DateDiff() Take Two Dates and return diff between them

→ 'الفرق بين الارقام'

Select(day, '12-04-2023', '12-05-2023')  
# 1 / diff 1 day between the  
Month, Year --

DateDiff(DatePart, Startdate, Enddate)

Start date is the initial date

End date is the final date

## ⑨ DateAdd() used to add

Two dates at calculated time

## ⑩ EOMonth() Take Date and return last Date of this Month

Select EOMonth(GetDate())

هذا يرجعنا تاريخ اخر يوم في الشهر الحالي

مدة 10

Date /  
No: /

## ⑤ String Fun

① `Format()` using to Display Date by way you want

Select Format (GetDate(), 'Form', 'ar')  
لیست ایجاد شده با انتخاب زبان ایجاد شد  
default English 'Fr'

Form 'dddd', 'ddd', 'dd', "d"  
Monday Mon 02 2

$M \rightarrow$  Month ,  $m \rightarrow$  minute

$$H \rightarrow 1-024 \quad , \quad h \rightarrow 1-012$$

```
Select Format(EndDate(), 'hh:mm:ss tt'  
PM 8, AM 12, etc) AS EndTime
```

\* Format using to Formatting of Date/time and number Values as strings

Declar @ B Date Date = '04.01.1999'

Select Format (Date, 'ddd')

# thursday

Date:

## ② UPPER() ③ LOWER()

Select UPPER(Fname), LOWER(Lname)  
From Students

## ④ LEN() Take String & return length

Select Fname, LEN(Fname)

From Employees

# Ahmed 5 (length of Ahmed)

## ⑤ SUBSTRING() using to get Sub String

يس هو امثلة جيدة لـ الـ SUBSTRING

Select SUBSTRING(Fname, 1, 3)

يـ هو أول ثلاثة حـ

## ⑥ ASCII() $\rightarrow$ return ASCII code Value of left most character of string

## ⑦ CHAR() Take ASCII Code & return Character of this ASCII Code

## ⑧ CONCAT\_WS() Separate between Two (+) CONCAT () لـ اكسل = (A1:A5)

Select CONCAT\_WS(' ', Fname, Age)

abdel 23 8 ' ' abdel 23

' '

- ⑩ `left()` Get # of string from left as substring  
Select `left('abcd', 2)`  
# ab
- ⑪ `Right()` Same as `left` but Get from right
- ⑫ `LTRIM()` Remove spaces from left side of string  
Select `LTRIM( string )`
- ⑬ `RTRIM()` Same as `LTRIM` but Remove space of right side
- ⑭ `Trim()` remove spaces from right side & left side

⑯ Replace () Take 3 Parameters

Select Replace ('Ahmed', 'hmed', 'i')  
# Ali

Select Replace('abcdFgcd', 'cd', 'xx')  
# ab xx Fg xx

⑰ Reverse () Take String & reverse  
Ahmed → demhA

⑱ Translate()

Translate('string', 'العربية', 'الإنجليزية')  
فبلاسها البروس

ex - Translate ('2\*[3+4]/{7-2}', '[]{}', '()' )

# 2\*(3+4)/(7-2)