DB Module

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SQL – Data Manipulation Language

Built-in Functions

Databases

Day 2

Prepared by Staff of School of ICT

Topics

- Functions
  - *Scalar* Functions
  - *Aggregate* Functions

Scalar - String Functions

- *LOWER*
  - converts string to lower case
- *UPPER*
  - converts string to upper case
- *REPLACE*
  - replaces string with other values
- *STR*
  - converts numeric data to string
- *SUBSTRING*
  - returns part of a string

Scalar - Mathematical Functions

- *CEILING*
  - returns the smallest integer >= the given numeric value
- *FLOOR*
  - returns the largest integer <= the given numeric value
- *ROUND*
  - rounds up a number to specified length or precision

Scalar - Date Time Functions

- *DATEADD* - adds an interval to a date
- *DATEDIFF* - difference between 2 dates
- *DATENAME* - returns date as string
- *GETDATE* - gets the current date
- *DATEPART* - returns an integer representing the specified part of the date
- *DAY* - returns an integer representing the DAY part of the date
- *MONTH* - returns an integer representing the month part of the date
- *YEAR* - returns an integer representing the year part of the date

Scalar - DATEPART & DATENAME

```
SELECT GETDATE() AS Today,
DATEPART(day,GETDATE()) AS Day,
DATENAME(month,GETDATE()) AS Month
```

Today	Day	Month
2003-07-11 13:55:15:660	11	July

Date Part	Abbreviation
year	yyyy or yy
month	mm or m
day	dd or d

Scalar - DATEADD

- *DATEADD* (*datepart*, *number*, *date*)

SELECT StaffID, Name, DateJoin,

DATEADD (month, 6, DateJoin)

As "Confirmation Date"

FROM Staff

Scalar - DATEDIFF

- *DATEDIFF* (*datepart*, *startdate*, *enddate*)

SELECT StaffID, Name,
DATEDIFF (Year, DOB, GETDATE()) As Age
FROM Staff

Scalar - System Functions

- *CAST*, *CONVERT* – converts one data type to another
  - *CAST (expression AS data_type)*
    - SELECT *CAST (CopyNo AS CHAR(2))*
      FROM BookCopy
      WHERE Status IS NOT NULL
  - *CONVERT (data_type [(length)], expression [, style])*
    - SELECT *CONVERT (VARCHAR(12), GETDATE(), 103)*

Scalar - System Functions

- *ISNULL* - replaces NULL with another value
  - *ISNULL (check_expression, replacement_value)*
    - SELECT Name, Address, *ISNULL (EmailAddr, 'Email not available ')* FROM Member

Aggregate Functions

- *COUNT*
- *MIN*
- *MAX*
- *AVG*
- *SUM*

Aggregate Function - COUNT

- Returns the number of items in a group

SELECT *COUNT(*)* AS "No. of Branches" FROM Branch

If Branch relation has 4 rows *COUNT(*)* returns ?

- *COUNT* ignores NULL values in column

Aggregate Function - MIN

- Returns the *minimum* value in a set of values for a single column

SELECT *MIN (Salary)* AS "Min. Salary" FROM Staff

Staff Relation

StaffID	Salary
1	1000
2	2000
3	3000

MIN(Salary)

is Minimum(1000, 2000, 3000)

= 1000

Aggregate Function - MAX

- Returns the *maximum* value in a set of values for a single column

SELECT *MAX(Salary)* AS "Max. Salary" FROM Staff

Staff Relation

StaffID	Salary
1	1000
2	2000
3	3000

MAX(Salary)

is Maximum(1000, 2000, 3000)

= 3000

Aggregate Function - AVG

- Returns the *average* value in a set of values for a single column

SELECT *AVG(Salary)* AS "Avg. Salary" FROM Staff

Staff Relation

StaffID	Salary
1	1000
2	2000
3	3000

AVG(Salary)

is Average(1000, 2000, 3000)

= 2000

Aggregate Function - SUM

- Returns the *sum* of all values in a set of values for a single column

SELECT *SUM(Salary)* AS "Total Salary" FROM Staff

Staff Relation

StaffID	Salary
1	1000
2	2000
3	3000

SUM(Salary)

is total(1000 + 2000 + 3000)

= 6000

Summary

- How to use SQL functions
  - *Scalar* functions
  - *Aggregate* functions