Agenda

```
- SQL FUNCTIONS
    String Functions
    Numeric Functions
    Date and Time Functions
    Flow Control Functions
    Group Functions
- Group ByClause
- Having Clause
```

SQL FUNCTIONS

```
HELP FUNCTIONS;
```

String Functions

```
HELP String Functions

HELP UPPER

SELECT UPPER("sunbeam");

SELECT UPPER(name) FROM books;

HELP LOWER

SELECT LOWER("SUNBEAM");

SELECT LOWER(ename) FROM emp;

HELP LEFT

SELECT LEFT("sunbeam",2);

HELP RIGHT

SELECT RIGHT("sunbeam",3);

-- display all the employees between B to J
SELECT ename FROM emp WHERE ename BETWEEN 'B' AND 'J';

SELECT ename FROM emp WHERE LEFT(ename,1) BETWEEN 'B' AND 'J';

-- display empno,first char of ename,jobs in lower case and sal.
SELECT empno,LEFT(ename,1),LOWER(job),sal FROM emp;
```

```sql
SELECT empno,LEFT(ename,1) Initial,LOWER(job) jobs,sal FROM emp;

 HELP SUBSTRING

 SELECT SUBSTRING("sunbeam",2);
 SELECT SUBSTRING("sunbeam",3,2);

 SELECT SUBSTRING("sunbeam",-2);
 SELECT SUBSTRING("sunbeam",-3,2);

 SELECT SUBSTRING(ename,2) FROM emp;

 HELP CONCAT

SELECT CONCAT("SUN","BEAM");

-- display the empname and his job as shown in below format
-- SMITH is working as CLERK
SELECT CONCAT(ename," is working as ",job) FROM emp;

-- dispaly first character of ename as capital and rest all letters in lowercase
SELECT LEFT(ename,1) FROM emp;
SELECT SUBSTRING(ename,2) FROM emp;

SELECT UPPER(LEFT(ename,1)) FROM emp;
SELECT LOWER(SUBSTRING(ename,2)) FROM emp;

SELECT CONCAT(UPPER(LEFT(ename,1)),LOWER(SUBSTRING(ename,2))) FROM emp;

HELP LPAD
SELECT LPAD("sunbeam",10,"*");

HELP LPAD
SELECT RPAD("sunbeam",10,"*");

-- display all empno as 7XX9
SELECT LEFT(empno,1) FROM emp;

SELECT RIGHT(empno,1) FROM emp;

SELECT CONCAT(LEFT(empno,1),"XX",RIGHT(empno,1)) FROM emp;

--display the outuput as shown below (TODO - HW)
-- ***SUNBEAM***
```

Numeric Functions

```sql
HELP Numeric Functions

SELECT POWER(3,2);
```

```
SELECT SQRT(25);

SELECT ROUND(123.456);

SELECT ROUND(123.456,2);

SELECT name,ROUND(price) price FROM books;

SELECT name,ROUND(price,2) price FROM books;

SELECT ROUND(123.456,-2);

SELECT ROUND(157.456,-2);

SELECT ROUND(287,-2);

SELECT ROUND(249,-2);

HELP CEILING
SELECT CEIL(5.23);
SELECT CEIL(-5.23);

HELP FLOOR
SELECT FLOOR(5.23);
SELECT FLOOR(-5.23);
```

Date and Time Functions

```
HELP Date and Time Functions

SELECT now();

SELECT SYSDATE();

SELECT now(),SLEEP(2),now();
-- It will execute after the statement ends

SELECT sysdate(),SLEEP(2),sysdate();
-- It will execute as soon as the function call is given

SELECT DATE(now());

SELECT TIME(now());

SELECT ename, hire AS OrderDate, DATE_ADD(hire,INTERVAL 10 DAY) DeliveryDate FROM
emp;

SELECT DATEDIFF(now(),hire) FROM emp;

SELECT TIMESTAMPDIFF(YEAR,hire,now()) FROM emp;
```

```
SELECT TIMESTAMPDIFF(MONTH,hire,now()) FROM emp;

-- display the emp along with their experiance in years
SELECT ename, TIMESTAMPDIFF(YEAR,hire,now()) AS exp_years FROM emp;

-- display the emp along with their experiance in years and months
SELECT ename, TIMESTAMPDIFF(YEAR,hire,now()) AS exp_years,
TIMESTAMPDIFF(MONTH,hire,now()) AS exp_months FROM emp;

SELECT ename, TIMESTAMPDIFF(YEAR,hire,now()) AS exp_years,
TIMESTAMPDIFF(MONTH,hire,now())%12 AS exp_months FROM emp;

SELECT DAY(NOW()),MONTH(NOW()),YEAR(NOW());
SELECT HOUR(NOW()),MINUTE(NOW()),SECOND(NOW());
```

Flow Control Functions

```
HELP Flow Control Functions

-- display all the emp having sal >2500 as rich and <=2500 as poor
SELECT ename,sal,IF(sal>2500,"RICH","POOR") as Category FROM emp;

SELECT IFNULL(comm,0) FROM emp;

-- If you want to null the specific data as NULL in your column you can use the
below function
SELECT NULLIF(sal,1100) FROM emp;
```

Group Functions

```
-- Dispaly the total cost for comapny in terms of salary paid
SELECT SUM(sal) as total FROM emp;

-- Display MAX,MIN,AVG package given to emmployees
SELECT MAX(sal),MIN(sal),AVG(sal) FROM emp;

-- Display count of employees in your company.
SELECT count(ename) FROM emp;
```

Set sql_mode in your my.ini file

```
- Open notepad with administrator privileges
- Open the file my.ini inside your notepad
- Under server section we will find sql-mode
- add the clause ONLY_FULL_GROUP_BY inside it and seperate it by ,
- save the file and close
```

```
- restart your mysql server
- check on mysql shell of the setting is done by using query
    SELECT @@ sql_mode;
```

Limitiations of Group Function

```
SELECT ename,max(sal) FROM emp; -- error
-- we cannot use grou function with noraml projection of columns
-- In aggregated query without GROUP BY, expression #1 of SELECT list contains
nonaggregated column

SELECT * FROM emp WHERE sal = MAX(sal); -- error
-- we cannot use group functions in where clause(for conditions)
-- Invalid use of group function

 SELECT LOWER(ename),MAX(sal) FROM emp;--error
-- we cannot use group function with list function

SELECT MAX(SUM(sal)) FROM emp; -- error
-- nesting of group functions is not allowed
-- Invalid use of group function
```

Group By clause

```
-- display count,MAX,MIN,AVG,SUM salaries
SELECT COUNT(sal),MAX(sal),MIN(sal),AVG(sal),SUM(sal) FROM emp;

-- display count,MAX,MIN,AVG,SUM salaries department wise
SELECT deptno,COUNT(sal),MAX(sal),MIN(sal),AVG(sal),SUM(sal) FROM emp GROUP BY
deptno;

-- display count,MAX,MIN,AVG,SUM salaries job wise
SELECT job,COUNT(sal),MAX(sal),MIN(sal),AVG(sal),SUM(sal) FROM emp GROUP BY job;

--display deptwise emp count
SELECT deptno,COUNT(empno) FROM emp GROUP BY deptno;

--display jobwise emp count
SELECT job,COUNT(empno) FROM emp GROUP BY job;

--display deptno,job and count
SELECT deptno,job FROM emp;
SELECT deptno,job FROM emp ORDER BY deptno;

SELECT deptno,job,COUNT(empno) FROM emp GROUP BY deptno,job;

SELECT deptno,job,COUNT(empno) FROM emp GROUP BY deptno,job ORDER BY deptno;
```

```
--deptwise total sal
SELECT deptno,SUM(sal) FROM emp GROUP BY deptno;
```

Having clause

```
- It must be used with Group By clause only
- If we want to provide the conditions on group function then we must use having
clause
```

```
-- deptwise total sal having total > 9000
SELECT deptno,SUM(sal) FROM emp GROUP BY deptno;

SELECT deptno,SUM(sal) FROM emp GROUP BY deptno HAVING SUM(sal)>9000;

-- display job wise total sal having total > 2500
SELECT job,SUM(sal) FROM emp GROUP BY job HAVING SUM(sal)>2500;

--display max sal for depts 10 and 20
SELECT deptno,sal FROM emp WHERE deptno IN(10,20);
SELECT deptno,MAX(sal) FROM emp WHERE deptno IN(10,20) GROUP BY deptno;

--display max sal for jobs in dept 10 and 20
SELECT job,sal FROM emp WHERE deptno IN(10,20);
SELECT job,MAX(sal) FROM emp WHERE deptno IN(10,20) GROUP BY job;

-- display max sal for all jobs in dept 10 and 20 having max sal > 2500
SELECT job,MAX(sal) FROM emp
WHERE deptno IN(10,20)
GROUP BY job
HAVING MAX(sal)>2500;

SELECT job,MAX(sal) FROM emp
WHERE deptno IN(10,20)
GROUP BY job
HAVING MAX(sal)>2500
ORDER BY job;

-- find the one dept that spends max on the emps salary
SELECT deptno,SUM(sal) FROM emp GROUP BY deptno;
SELECT deptno,SUM(sal) FROM emp GROUP BY deptno ORDER BY SUM(sal) DESC;
SELECT deptno,SUM(sal) FROM emp GROUP BY deptno ORDER BY SUM(sal) DESC LIMIT 1;

-- find job having lowest average salary
SELECT job,AVG(sal) FROM emp GROUP BY job;
SELECT job,AVG(sal) FROM emp GROUP BY job ORDER BY AVG(sal);
SELECT job,AVG(sal) FROM emp GROUP BY job ORDER BY AVG(sal) LIMIT 1;
```

```sql
-- find job with lowest avg total income (total income = sal + comm)
SELECT ename,sal,comm,sal+comm as TI FROM emp;
SELECT ename,sal,comm,IFNULL(comm,0.0)+sal as TI FROM emp;
SELECT AVG(IFNULL(comm,0.0)+sal) as avg_sal FROM emp;
SELECT job,AVG(IFNULL(comm,0.0)+sal) as avg_sal FROM emp GROUP BY job;
SELECT job,AVG(IFNULL(comm,0.0)+sal) as avg_sal FROM emp GROUP BY job ORDER BY
avg_sal;
SELECT job,AVG(IFNULL(comm,0.0)+sal) as avg_sal FROM emp GROUP BY job ORDER BY
avg_sal LIMIT 1;
```