Module-7: Data Manipulation Functions

Functions are operations that are usually performed on data
An example of a function is RTRIM()

Types of functions:

1. Text Manipulation Functions

are used to manipulate strings of text (Ex: trimming and converting values to upper and lowercase).
Commonly Used Text Manipulation Functions are:

```
SELECT LEFT('Chanakya_Uni',3)
SELECT RIGHT('Chanakya_Uni',3)
SELECT SUBSTRING('Chanakya_Uni',3,3)
SELECT DATALENGTH('Chanakya_Uni    ')
SELECT LEN('Chanakya_Uni    ')
SELECT LOWER('Chanakya_Uni')
SELECT UPPER('Chanakya_Uni')
SELECT LTRIM('    Chanakya_Uni    ')
SELECT RTRIM('    Chanakya_Uni    ')

Convert Vendor names to upper case
SELECT vend_name, UPPER(vend_name) AS vend_name_upcase
FROM Vendors
ORDER BY vend_name;

SOUNDEX Function:

SELECT cust_name, cust_contact
FROM Customers
WHERE cust_contact = 'Michael Green';

SELECT cust_name, cust_contact
FROM Customers
WHERE SOUNDEX(cust_contact) = SOUNDEX('Michael Green');
```

2. Date and Time Manipulation Functions:

```
SELECT GETDATE() AS Todays_dateTodays date

SELECT GETDATE() -1 AS Yesterday_date --Yesterday date

SELECT GETDATE() +1 AS Tomorrow_date --Tomorrow date

SELECT GETDATE() +2 AS DayAfterTomorrow_date --Day After Tomorrow date
```

There are three diffrent functions in SQL to modify or perform any date related task
2.1 DATEDIFF()
2.2 DATEPART()
2.3 DATEADD()

2.1 DATEDIFF() function

Returns the no of days between two dates

Syntax : DATEDIFF(interval, date_1/date_col_1, date_2/date_col_2)

Interval:	Keywords
Year :	Year,YYYY, YY
Quarter :	Quarter, QQ, Q
Month :	Month, MM, M
Day of the year :	DAYOFYEAR
Day :	DAY,DY,Y
Weekday :	WEEK,WW,WK
Hour :	HOUR,HH
Minute :	MINUTE,MI,N
Second :	SECOND,SS,S
Millisecond :	MILISECOND , MS

```
SELECT DATEDIFF(DY,'1987/09/13','2021/09/13')
SELECT DATEDIFF(M,'1987/09/13','2021/09/13')
SELECT DATEDIFF(MINUTE,'1987/09/13','2021/09/13')
select DATEDIFF(YYYY,GETDATE(),GETDATE()+365)

HOW  to calculate your age ?
SELECT DATEDIFF(YY,'1999/08/15',GETDATE()) as Present_Age

CREATE TABLE Account_details (
ACCT_NUMBER INT PRIMARY KEY IDENTITY(11112881,1),
ACCT_NAME VARCHAR(20),
ACCT_OPEN_DATE VARCHAR(20),
BRANCH VARCHAR(20))

INSERT INTO Account_details VALUES ('Shubham','2015/12/09','MUMBAI')
INSERT INTO Account_details VALUES ('Rihan','2016/01/12','Jaipur')
INSERT INTO Account_details VALUES ('Sheetal','2017/08/11','GOA')
INSERT INTO Account_details VALUES ('Priyanka','2017/01/01','Chennai')
INSERT INTO Account_details VALUES ('Manik','2015/01/08','Agra')
INSERT INTO Account_details VALUES ('Veena','2021/01/01','Patna')
INSERT INTO Account_details VALUES ('Rohan','2019/07/01','Pune')
INSERT INTO Account_details VALUES ('Laxmi',GETDATE(),'rohatak')
INSERT INTO Account_details VALUES ('Jinal',GETDATE()-1,'Indore')

SELECT * FROM Account_details;

Acoounts opened during the current year
SELECT *,DATEDIFF(YY,ACCT_OPEN_DATE,GETDATE()) as accountage from Account_details
WHERE DATEDIFF(YY,ACCT_OPEN_DATE,GETDATE()) = 0
```

2.2 DATEPART Function:

This will allow you to display the part pf Dates.

Syntax : DATEPART(interval, date/column_name)

```
SELECT *, DATEPART(YY,ACCT_OPEN_DATE) AS ACC_YEARS FROM Account_details
SELECT *, DATEPART(MM,ACCT_OPEN_DATE) AS ACC_MONTHS FROM Account_details
SELECT *, DATEPART(DY,ACCT_OPEN_DATE) AS ACC_DAYS FROM Account_details

How to show accounts opened during this year
SELECT * FROM Account_details WHERE DATEPART(YY,ACCT_OPEN_DATE) =2021

--How to show accounts opened in month of January of this year
SELECT * FROM Account_details WHERE DATEPART(YY,ACCT_OPEN_DATE) IN (2021) AND
DATEPART(MM,ACCT_OPEN_DATE) IN (1)
```

2.3 DATEADD() Function:

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it will allow you to add the dates.
it will accept three arguments.

Syntax : DATEADD(interval, value, date/date_col)

```
SELECT DATEADD(DD,30,GETDATE()) AS After30_Days

SELECT DATEADD(YY,10,GETDATE()) -2 leap year Will come in 10 years
SELECT GETDATE()+3650 2 days different will be there because of 366 days are there in
leap year
```

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3. Numeric Manipulation Functions

Commonly Used Numeric Manipulation Functions are:

Function	Description
ABS()	Returns a number's absolute value
SQRT()	Returns the square root of a specified number
EXP()	Returns the exponential value of a specific number
PI()	Returns the value of PI
SIN()	Returns the trigonometric sine of a specified angle
COS()	Returns the trigonometric cosine of a specified angle
TAN()	Returns the trigonometric tangent of a specified angle

Examples:

```
SELECT ABS(-120)
SELECT SQRT(16)
SELECT EXP(2)
SELECT PI()
SELECT SIN(30)
SELECT COS(60)
SELECT TAN(90)
```

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4. Formatting functions:

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are used to generate user-friendly outputs
Example: displaying dates in local languages and formats, or currencies with the right symbols and comma placement.

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5. System functions:

Return information specific to the DBMS being used.
Example: returning user login information.

Challenges:

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1. Calculate the no of accounts which is opened during the current Month.

2. Calculate the age of accounts in years for all account holders in a table.

3. Calculate the age of accounts in Months who have completed 1 Year

4. Calculate the age of accounts in Years who have completed 4 Year