

Experiment No 07: Write Queries using Arithmetic operators:

I. Practical Significance:

The arithmetic operators are used on the data stored in the tables. We can use these operators with the SELECT statement in SQL. We can also use WHERE clause in the SELECT statement for performing operations on particular rows. The arithmetic operators are used between two numerical operands for performing addition, subtraction, multiplication and division operations. This practical allows students to write SQL queries using arithmetic operators and performs mathematical operations on the data stored in the tables.

II. INDUSTRY / EMPLOYER EXPECTED OUTCOME:

To implement arithmetic operators to apply various conditions in query on the given database application

**III. COURSE LEVEL LEARNING OUTCOMES (COS):CO3 -
Manage database using SQL.**

IV. LABORATORY LEARNING OUTCOME:

Implement arithmetic operators to data stored in the table.

V. Relevant Affective Domain related outcome(s)

- a. Follow precautionary measures.
- b. Follow installation steps.
- c. Follow ethical practices.

VI. Relevant Theoretical Background

Serial Number	Operator Name	Explanation	Syntax
1	ADDITION	The addition plus (+) operator is used	SELECT <Expression>[arithmetic

		to add two or more expressions or numbers.	operator]<expression>... FROM [table_name] WHERE [expression];
2	SUBTRACTION	The subtraction minus (-) operator is used to subtract one expression or number from another expression or number.	SELECT <Expression>[arithmetic operator]<expression>... FROM [table_name] WHERE [expression];
3	MULTIPLICATION	The multiply operators (*) is used to multiply two or more expressions or numbers.	SELECT <Expression>[arithmetic operator]<expression>... FROM [table_name] WHERE [expression];
4	DIVISION	The division operators (/) is used to divide one expression or number by another.	SELECT <Expression>[arithmetic operator]<expression>... FROM [table_name] WHERE [expression];
5	MODULO	The modulo operator (%) returns the remainder (integer) of the division.	SELECT <Expression>[arithmetic operator]<expression>... FROM [table_name] WHERE [expression];

Compound Operators:

Operator	Operator Name	Explanation
+=	+= (Add Assignment) (Transact-SQL)	Adds some amount to the original value and sets the original value to the result.
-=	-= (Subtract Assignment) (Transact-SQL)	Subtracts some amount from the original value and sets the original value to the result.
*=	*= (Multiply Assignment) (Transact-SQL)	Multiplies by an amount and sets the original value to the result.
/=	(Divide Assignment) (Transact-SQL)	Divides by an amount and sets the original value to the result.
%=	Modulus Assignment (Transact-SQL)	Divides by an amount and sets the original value to the modulo.

&=	&= (Bitwise AND Assignment) (Transact-SQL)	Performs a bitwise AND and sets the original value to the result.
^=	^= (Bitwise Exclusive OR Assignment) (Transact-SQL)	Performs a bitwise exclusive OR and sets the original value to the result.
=	= (Bitwise OR Assignment) (Transact-SQL)	Performs a bitwise OR and sets the original value to the result.

VII. Required Resources/apparatus/equipment with specifications

Sr.No	Equipment Name with Broad Specifications	Relevant LLO Number
1	Computer system with all necessary components like; motherboard, random access memory (RAM), read-only memory (ROM), internal hard disk drives, Mouse, Keyboard, and RDBMS applications such as Oracle Express Edition, MySQL, SQLite, Oracle Live SQL etc.	All

VIII. Procedure

1. Create tables for the given application
2. Apply Arithmetic operators on the given application

IX. Result(s)

In this Practical we learn queries using Arithmetic operator

X. Practical related questions (Provide space for answers)

Note: Below are a few sample questions for reference. Teacher must design more such questions so as to ensure the achievement of identified CO.

1. What is precedence/ SQL arithmetic order in arithmetic operators?
2. Explain the SQL exponentiation operator.
3. List few compound operators.

(Space for answer)

1) →

① Add (+)

this operator used to add to operands.

ex:

select salary, salary + 500 as new_salary from emp;

② Sub (-)

this operator used to sub two operands

ex:

select salary - 200 as salary from emp;

③ Multiply (*)

It is multiply both operands

ex:

select salary * 20 as salary from emp;

④ Division (/)

It divide left hand operand by right hand operands

ex:

select salary / 2 as salary from emp;

XI. Exercise

1. Consider the following schema

Orders(cust_id, order_id, items, amount)

Write queries for the following:

- i. Display new column named total_amount which is 200 added to the amount field.
- ii. Display new column named offer_price which is 100 subtracted from the amount field.
- iii. Display new column named revised_amount which is multiplied by 5 times the amount field.
- iv. Display new column named half_amount which is divided by 2 to the amount field.

2] →

The SQL exponentiation operator is denoted by the caret symbol (^) or the double asterisk (**) in database.

It raises the base value to the power of the exponent.

Syntax:

base ^ exponent

OR

base ** exponent

Example :

SELECT 2 ^ 3 ;

OR

SELECT 2 ** 3 ;

output : 8

• Power Function

It is used to raise a number to a specified power or exponent. It is mathematical function.

Syntax:

SELECT POWER (base , exponent) FROM table-name

where Condition

Example :

SELECT account_id power (interest_rate , 2) FROM account
where Compound interest factor

3] →

List few compound operator:

1. Addition Assignment ($+=$):

Add some amount to the original value and sets the original value to the result.

Syntax:

SET Column_name $+=$ Value;

Example:

Update employees SET Salary $+=$ 500 where
employee_id = 1;

2. Subtract Assignment ($-=$):

Subtract some amount from the original value & set the original value to the result.

Syntax:

SET Column_name $-=$ Value;

Example:

Update products SET stock_quantity $-=$ 10 where
product_id = 100;

3. Multiply Assignment ($*=$):

multiplies by an amount & sets the original value to the result.

Syntax:

SET Column_name *= Value;

Example:

Update employees SET Salary *= 5.5 where
employee_id = 191;

4. Divide Assignment (/=)

Divides by an amount and sets the original
value to the result

Syntax:

SET Column_name /= Value;

Example:

Update employees SET Salary /= 2 where
employee_id = 191;

5. Modulus Assignment (%=)

Divides by an amount & sets the original value
to the modulo.

Syntax:

SET column_name %= Value;

Example:

Update my-table SET my-column %= 5 where
id = 191;

* Exercise

1] Display new column named total_amount which is 200 added to the amount field.

```
SELECT cust_id, order_id, items, amount  
(amount + 200) as total_amount from orders.
```

2] Display new column named offer_price which is 100 subtracted from the amount field.

```
SELECT amount - 100 as offer_price  
from orders;
```

3] Display new column named revised_amount which is multiplied by 5 times the amount field.

```
SELECT amount * 5 as revised_amount  
from orders;
```

4] Display new column named half_amount which is divided by 2 to the amount field.

```
SELECT amount / 2 as half_amount  
from orders;
```


DATABASE MANAGEMENT SYSTEM (313302)

XII. References/Suggestions for further reading: include websites/links

1. https://www.youtube.com/watch?v=iF_JcTfVS4w
2. <https://www.tutorialspoint.com/sql/sql-logical-operators.htm>
3. <https://www.javatpoint.com/sql-logical-operators>
4. https://www.youtube.com/watch?v=NJZ206_iJ0I
5. Compound Operators (Transact-SQL) - SQL Server | Microsoft Learn

XIII. Assessment Scheme

Performance indicators		Weightage
Sr. No	Process related (10 Marks)	30%
1.	Tool Selection Ability	20%
2.	Follow Ethical Practices	10%
Product related (15 Marks)		70%
3.	Verifying System Requirement for Installation	20%
4.	Correctness in Use of Command Tools	15%
5.	Use of Attribute/s Options	15%
6.	Timely Submission	10%
7.	Answering Sample Questions	10%
Total (50 Marks)		100%