

FULL STACK

AGGREGATE FUNCTIONS:

```
mysql> SELECT COUNT(*) FROM STUDENT;
+-----+
| COUNT(*) |
+-----+
|      10 |
+-----+
1 row in set (0.01 sec)

mysql> SELECT SUM(COURSE_ID) FROM COURSES;
+-----+
| SUM(COURSE_ID) |
+-----+
|      1055 |
+-----+
1 row in set (0.00 sec)

mysql> SELECT AVG(YEAR_OF_STUDYING) FROM STUDENT;
+-----+
| AVG(YEAR_OF_STUDYING) |
+-----+
|      2.7000 |
+-----+
1 row in set (0.00 sec)

mysql> SELECT*FROM STUDENT WHERE YEAR_OF_STUDYING>1;
+-----+-----+-----+-----+-----+-----+-----+-----+
| STD_ID | NAME   | EMAIL            | PASSWORD | ROLE    | PHONE   | STATUS  | YEAR_OF_STUDYING |
+-----+-----+-----+-----+-----+-----+-----+-----+
| 24501 | ARUN   | arun123@gmail.com | pass123 | student | 9809836432 | active  | 3          |
| 24502 | PRIYA  | priya123@gmail.com | pass456 | student | 9089836432 | active  | 3          |
| 24503 | RAHUL  | rahul123@gmail.com | pass789 | student | 6809836432 | inactive | 2          |
| 24504 | SNEHA  | sneha123@gmail.com | pass987 | student | 7089836432 | active  | 4          |
| 24505 | VIKRAM | vikram123@gmail.com | pass654 | student | 8089835432 | active  | 2          |
| 24506 | NISHANTH | nish123@gmail.com | pass719 | student | 9989836432 | active  | 4          |
| 24507 | ANJALI | anju123@gmail.com | pass739 | student | 9989636432 | active  | 3          |
| 24508 | KARAN  | karan123@gmail.com | pass839 | student | 9989633232 | inactive | 2          |
| 24509 | DIVYA  | divya123@gmail.com | pass321 | student | 9989633112 | active  | 3          |
+-----+-----+-----+-----+-----+-----+-----+-----+
9 rows in set (0.00 sec)

mysql> SELECT MIN(YEAR_OF_STUDYING) FROM STUDENT;
+-----+
| MIN(YEAR_OF_STUDYING) |
+-----+
|      1 |
+-----+
1 row in set (0.00 sec)

mysql> SELECT MAX(YEAR_OF_STUDYING) FROM STUDENT;
+-----+
| MAX(YEAR_OF_STUDYING) |
+-----+
|      4 |
+-----+
1 row in set (0.00 sec)
```

VIEWS:

```
mysql> CREATE VIEW STUDENT_CLG_DETAILS AS SELECT STD_ID,NAME,ROLE,YEAR_OF_STUDYING FROM STUDENT;
Query OK, 0 rows affected (0.02 sec)

mysql> SELECT*FROM STUDENT_CLG_DETAILS;
+-----+-----+-----+-----+
| STD_ID | NAME   | ROLE    | YEAR_OF_STUDYING |
+-----+-----+-----+-----+
| 24501 | ARUN   | student | 3          |
| 24502 | PRIYA  | student | 3          |
| 24503 | RAHUL  | student | 2          |
| 24504 | SNEHA  | student | 4          |
| 24505 | VIKRAM | student | 2          |
| 24506 | NISHANTH | student | 4          |
| 24507 | ANJALI | student | 3          |
| 24508 | KARAN  | student | 2          |
| 24509 | DIVYA  | student | 3          |
| 24510 | MEERA  | student | 1          |
+-----+-----+-----+-----+
10 rows in set (0.01 sec)
```

JOINS:

```
mysql> SELECT s.STD_ID , c.COURSE_NAME, s.NAME FROM STUDENT s JOIN COURSES c ON s.STD_ID = c.INSTRUCTOR_ID;
+-----+-----+-----+
| STD_ID | COURSE_NAME | NAME |
+-----+-----+-----+
| 24501 | WEB DEVELOPMENT BASICS | ARUN |
| 24502 | PYTHON PROGRAMMING | PRIYA |
| 24503 | DATA ANALYSIS WITH EXCEL | RAHUL |
| 24504 | SEO | SNEHA |
| 24505 | GRAPHIC DESIGN ESSENTIALS | VIKRAM |
| 24506 | DATABASE MANAGEMENT | NISHANTH |
| 24507 | CYBERSECURITY FUNDAMENTALS | ANJALI |
| 24508 | MACHNE LEARNING BASICS | KARAN |
| 24509 | MOBILE APP DEVELOPMENT | DIVYA |
| 24510 | CLOUD COMPUTING WITH AWS | MEERA |
+-----+-----+-----+
10 rows in set (0.02 sec)
```

INNER JOINS:

```
mysql> SELECT c.COURSE_ID, c.COURSE_NAME, s.NAME AS Instructor_Name
-> FROM COURSES c
-> INNER JOIN STUDENT s
-> ON c.INSTRUCTOR_ID = s.STD_ID;
+-----+-----+-----+
| COURSE_ID | COURSE_NAME | Instructor_Name |
+-----+-----+-----+
| 101 | WEB DEVELOPMENT BASICS | ARUN |
| 102 | PYTHON PROGRAMMING | PRIYA |
| 103 | DATA ANALYSIS WITH EXCEL | RAHUL |
| 104 | SEO | SNEHA |
| 105 | GRAPHIC DESIGN ESSENTIALS | VIKRAM |
| 106 | DATABASE MANAGEMENT | NISHANTH |
| 107 | CYBERSECURITY FUNDAMENTALS | ANJALI |
| 108 | MACHNE LEARNING BASICS | KARAN |
| 109 | MOBILE APP DEVELOPMENT | DIVYA |
| 110 | CLOUD COMPUTING WITH AWS | MEERA |
+-----+-----+-----+
10 rows in set (0.00 sec)
```

LEFT JOINS:

```
mysql> SELECT s.STD_ID, s.NAME, s.EMAIL, s.STATUS, sc.YEAR_OF_STUDYING
-> FROM STUDENT s
-> LEFT JOIN STUDENT_CLG_DETAILS sc
-> ON s.STD_ID = sc.STD_ID
-> WHERE sc.YEAR_OF_STUDYING > 2;
+-----+-----+-----+-----+-----+
| STD_ID | NAME    | EMAIL      | STATUS   | YEAR_OF_STUDYING |
+-----+-----+-----+-----+-----+
| 24501  | ARUN    | arun123@gmail.com | active   | 3          |
| 24502  | PRIYA   | priya123@gmail.com | active   | 3          |
| 24504  | SNEHA   | sneha123@gmail.com | active   | 4          |
| 24506  | NISHANTH | nish123@gmail.com | active   | 4          |
| 24507  | ANJALI   | anju123@gmail.com | active   | 3          |
| 24509  | DIVYA   | divya123@gmail.com | active   | 3          |
+-----+-----+-----+-----+-----+
6 rows in set (0.00 sec)
```

RIGHT JOIN:

```
mysql> SELECT c.COURSE_ID , c.COURSE_NAME ,s.STD_ID as STUDENT_ID FROM COURSES c RIGHT JOIN STUDENT_CLG_DETAILS s ON s.STD_ID=c.INSTRUCTOR_ID;
+-----+-----+-----+
| COURSE_ID | COURSE_NAME           | STUDENT_ID |
+-----+-----+-----+
| 107 | CYBERSECURITY FUNDAMENTALS | 24507 |
| 101 | WEB DEVELOPMENT BASICS | 24501 |
| 109 | MOBILE APP DEVELOPMENT | 24509 |
| 108 | MACHNE LEARNING BASICS | 24508 |
| 110 | CLOUD COMPUTING WITH AWS | 24510 |
| 106 | DATABASE MANAGEMENT | 24506 |
| 102 | PYTHON PROGRAMMING | 24502 |
| 103 | DATA ANALYSIS WITH EXCEL | 24503 |
| 104 | SEO | 24504 |
| 105 | GRAPHIC DESIGN ESSENTIALS | 24505 |
+-----+-----+-----+
10 rows in set (0.00 sec)
```

DDL (Data Definition Language)

```
mysql> CREATE TABLE ENROLLMENTS (
->     ENROLL_ID INT PRIMARY KEY AUTO_INCREMENT,
->     STD_ID INT,
->     COURSE_ID INT,
->     ENROLL_DATE DATE,
->     FOREIGN KEY (STD_ID) REFERENCES STUDENT(STD_ID),
->     FOREIGN KEY (COURSE_ID) REFERENCES COURSES(COURSE_ID)
-> );
Query OK, 0 rows affected (0.22 sec)
```

```

mysql> ALTER TABLE STUDENT RENAME COLUMN YEAR TO YEAR_OF_STUDYING;
Query OK, 0 rows affected (0.06 sec)
Records: 0  Duplicates: 0  Warnings: 0

mysql> SELECT*FROM STUDENT;
+---+---+---+---+---+---+---+---+---+
| STD_ID | NAME | EMAIL | PASSWORD | ROLE | PHONE | STATUS | YEAR_OF_STUDYING | ADDRESS |
+---+---+---+---+---+---+---+---+---+
| 24501 | ARUN | arun123@gmail.com | pass123 | student | 9809836432 | active | NULL | NULL |
| 24502 | PRIYA | priya123@gmail.com | pass456 | student | 9089836432 | active | NULL | NULL |
| 24503 | RAHUL | rahul123@gmail.com | pass789 | student | 6809836432 | active | NULL | NULL |
| 24504 | SNEHA | sneha123@gmail.com | pass987 | student | 7089836432 | active | NULL | NULL |
| 24505 | VIKRAM | vikram123@gmail.com | pass654 | student | 8089835432 | active | NULL | NULL |
| 24506 | NISHANTH | nish123@gmail.com | pass719 | student | 9989836432 | active | NULL | NULL |
| 24507 | ANJALI | anju123@gmail.com | pass739 | student | 9989636432 | active | NULL | NULL |
| 24508 | KARAN | karan123@gmail.com | pass839 | student | 9989633232 | inactive | NULL | NULL |
| 24509 | DIVYA | divya123@gmail.com | pass321 | student | 9989633112 | active | NULL | NULL |
| 24510 | MEERA | meera123@gmail.com | pass639 | student | 9989622332 | active | NULL | NULL |
+---+---+---+---+---+---+---+---+---+
10 rows in set (0.00 sec)

```

DML is used to **insert, update, delete, and query data.**

```

mysql> UPDATE STUDENT SET YEAR_OF_STUDYING=3 WHERE STD_ID=24501;
Query OK, 1 row affected (0.01 sec)
Rows matched: 1  Changed: 1  Warnings: 0

mysql> SELECT*FROM STUDENT;
+---+---+---+---+---+---+---+---+
| STD_ID | NAME | EMAIL | PASSWORD | ROLE | PHONE | STATUS | YEAR_OF_STUDYING |
+---+---+---+---+---+---+---+---+
| 24501 | ARUN | arun123@gmail.com | pass123 | student | 9809836432 | active | 3 |
| 24502 | PRIYA | priya123@gmail.com | pass456 | student | 9089836432 | active | NULL |
| 24503 | RAHUL | rahul123@gmail.com | pass789 | student | 6809836432 | active | NULL |
| 24504 | SNEHA | sneha123@gmail.com | pass987 | student | 7089836432 | active | NULL |
| 24505 | VIKRAM | vikram123@gmail.com | pass654 | student | 8089835432 | active | NULL |
| 24506 | NISHANTH | nish123@gmail.com | pass719 | student | 9989836432 | active | NULL |
| 24507 | ANJALI | anju123@gmail.com | pass739 | student | 9989636432 | active | NULL |
| 24508 | KARAN | karan123@gmail.com | pass839 | student | 9989633232 | inactive | NULL |
| 24509 | DIVYA | divya123@gmail.com | pass321 | student | 9989633112 | active | NULL |
| 24510 | MEERA | meera123@gmail.com | pass639 | student | 9989622332 | active | NULL |
+---+---+---+---+---+---+---+---+
10 rows in set (0.00 sec)

```

ORDER BY:

```

mysql> SELECT COURSE_ID , COURSE_NAME , DURATION FROM COURSES ORDER BY DURATION DESC;
+---+---+---+
| COURSE_ID | COURSE_NAME | DURATION |
+---+---+---+
| 109 | MOBILE APP DEVELOPMENT | 9 WEEKS |
| 102 | PYTHON PROGRAMMING | 8 WEEKS |
| 108 | MACHINE LEARNING BASICS | 8 WEEKS |
| 106 | DATABASE MANAGEMENT | 7 WEEKS |
| 101 | WEB DEVELOPMENT BASICS | 6 WEEKS |
| 104 | SEO | 6 WEEKS |
| 107 | CYBERSECURITY FUNDAMENTALS | 6 WEEKS |
| 105 | GRAPHIC DESIGN ESSENTIALS | 5 WEEKS |
| 103 | DATA ANALYSIS WITH EXCEL | 4 WEEKS |
| 110 | CLOUD COMPUTING WITH AWS | 10 WEEKS |
+---+---+---+
10 rows in set (0.00 sec)

mysql> SELECT COURSE_ID , COURSE_NAME , DURATION FROM COURSES ORDER BY COURSE_ID ASC;
+---+---+---+
| COURSE_ID | COURSE_NAME | DURATION |
+---+---+---+
| 101 | WEB DEVELOPMENT BASICS | 6 WEEKS |
| 102 | PYTHON PROGRAMMING | 8 WEEKS |
| 103 | DATA ANALYSIS WITH EXCEL | 4 WEEKS |
| 104 | SEO | 6 WEEKS |
| 105 | GRAPHIC DESIGN ESSENTIALS | 5 WEEKS |
| 106 | DATABASE MANAGEMENT | 7 WEEKS |
| 107 | CYBERSECURITY FUNDAMENTALS | 6 WEEKS |
| 108 | MACHNE LEARNING BASICS | 8 WEEKS |
| 109 | MOBILE APP DEVELOPMENT | 9 WEEKS |
| 110 | CLOUD COMPUTING WITH AWS | 10 WEEKS |
+---+---+---+
10 rows in set (0.00 sec)

```

BUILT - IN FUNCTIONS :

```
mysql> SELECT COURSE_NAME, UPPER(COURSE_NAME) AS UPPER_NAME FROM COURSES;
+-----+-----+
| COURSE_NAME | UPPER_NAME |
+-----+-----+
| WEB DEVELOPMENT BASICS | WEB DEVELOPMENT BASICS |
| PYTHON PROGRAMMING | PYTHON PROGRAMMING |
| DATA ANALYSIS WITH EXCEL | DATA ANALYSIS WITH EXCEL |
| SEO | SEO |
| GRAPHIC DESIGN ESSENTIALS | GRAPHIC DESIGN ESSENTIALS |
| DATABASE MANAGEMENT | DATABASE MANAGEMENT |
| CYBERSECURITY FUNDAMENTALS | CYBERSECURITY FUNDAMENTALS |
| MACHNE LEARNING BASICS | MACHNE LEARNING BASICS |
| MOBILE APP DEVELOPMENT | MOBILE APP DEVELOPMENT |
| CLOUD COMPUTING WITH AWS | CLOUD COMPUTING WITH AWS |
+-----+-----+
10 rows in set (0.02 sec)

mysql> SELECT COURSE_NAME, LOWER(COURSE_NAME) AS LOWER_NAME FROM COURSES;
+-----+-----+
| COURSE_NAME | LOWER_NAME |
+-----+-----+
| WEB DEVELOPMENT BASICS | web development basics |
| PYTHON PROGRAMMING | python programming |
| DATA ANALYSIS WITH EXCEL | data analysis with excel |
| SEO | seo |
| GRAPHIC DESIGN ESSENTIALS | graphic design essentials |
| DATABASE MANAGEMENT | database management |
| CYBERSECURITY FUNDAMENTALS | cybersecurity fundamentals |
| MACHNE LEARNING BASICS | machne learning basics |
| MOBILE APP DEVELOPMENT | mobile app development |
| CLOUD COMPUTING WITH AWS | cloud computing with aws |
+-----+-----+
10 rows in set (0.01 sec)
```

```
mysql> SELECT NAME , LEFT(NAME, 5) AS SHORT_NAME FROM STUDENT;
+-----+-----+
| NAME | SHORT_NAME |
+-----+-----+
| ARUN | ARUN |
| PRIYA | PRIYA |
| RAHUL | RAHUL |
| SNEHA | SNEHA |
| VIKRAM | VIKRA |
| NISHANTH | NISHA |
| ANJALI | ANJAL |
| KARAN | KARAN |
| DIVYA | DIVYA |
| MEERA | MEERA |
+-----+-----+
10 rows in set (0.01 sec)

mysql> SELECT COURSE_NAME, LENGTH(DESCRIPTION) AS DESC_LENGTH FROM COURSES;
+-----+-----+
| COURSE_NAME | DESC_LENGTH |
+-----+-----+
| WEB DEVELOPMENT BASICS | 42 |
| PYTHON PROGRAMMING | 43 |
| DATA ANALYSIS WITH EXCEL | 42 |
| SEO | 39 |
| GRAPHIC DESIGN ESSENTIALS | 45 |
| DATABASE MANAGEMENT | 38 |
| CYBERSECURITY FUNDAMENTALS | 35 |
| MACHNE LEARNING BASICS | 39 |
| MOBILE APP DEVELOPMENT | 36 |
| CLOUD COMPUTING WITH AWS | 35 |
+-----+-----+
10 rows in set (0.01 sec)
```

```

mysql> SELECT NOW() AS CURRENT_DATE_TIME ;
+-----+
| CURRENT_DATE_TIME |
+-----+
| 2026-01-07 14:34:12 |
+-----+
1 row in set (0.01 sec)

mysql> SELECT YEAR(NOW()) AS CURRENT_YEAR ;
+-----+
| CURRENT_YEAR |
+-----+
| 2026 |
+-----+
1 row in set (0.01 sec)

```

```

mysql> DELIMITER //
mysql> CREATE FUNCTION duration_in_days(weeks VARCHAR(10))
    -> RETURNS INT
    -> DETERMINISTIC
    -> BEGIN
    ->     DECLARE days INT;
    ->     -- Extract number part from '6 WEEKS'
    ->     SET days = CAST(SUBSTRING_INDEX(weeks, ' ', 1) AS UNSIGNED) * 7;
    ->     RETURN days;
    -> END //
ERROR 1304 (42000): FUNCTION duration_in_days already exists
mysql> DELIMITER ;
mysql>
mysql> -- Usage
mysql> SELECT COURSE_NAME, DURATION, duration_in_days(DURATION) AS DURATION_DAYS
    -> FROM COURSES;
+-----+-----+-----+
| COURSE_NAME | DURATION | DURATION_DAYS |
+-----+-----+-----+
| WEB DEVELOPMENT BASICS | 6 WEEKS | 42 |
| PYTHON PROGRAMMING | 8 WEEKS | 56 |
| DATA ANALYSIS WITH EXCEL | 4 WEEKS | 28 |
| SEO | 6 WEEKS | 42 |
| GRAPHIC DESIGN ESSENTIALS | 5 WEEKS | 35 |
| DATABASE MANAGEMENT | 7 WEEKS | 49 |
| CYBERSECURITY FUNDAMENTALS | 6 WEEKS | 42 |
| MACHINE LEARNING BASICS | 8 WEEKS | 56 |
| MOBILE APP DEVELOPMENT | 9 WEEKS | 63 |
| CLOUD COMPUTING WITH AWS | 10 WEEKS | 70 |
+-----+-----+-----+
10 rows in set (0.01 sec)

```