

1. Standard Database Connection

```
<?php
$servername = "localhost";
$username = "root";
$password = "";
$dbname = "university";

$conn = new mysqli($servername, $username, $password, $dbname);
if ($conn->connect_error) {
    die("Connection failed: " . $conn->connect_error);
}

$sql = "SELECT * FROM student";
$result = $conn->query($sql);
?>
```

2. Task: Find Highest CGPA Name

Logic: Iterate through all records, compare CGPA, and store the student's name.

```
if ($result->num_rows > 0) {
    $large = -1;
    $top_student = "";
    while($row = $result->fetch_assoc()) {
        if($row["cgpa"] > $large){
            $large = $row["cgpa"];
            $top_student = $row["name"];
        }
    }
    echo "The student with highest CGPA ($large) is: $top_student";
}
```

3. Task: Filter Students (Non-CSE) in Table

Logic: Use '!= operator inside the while loop to skip certain departments.

```
if ($result->num_rows > 0) {
    echo "<table border=1><th>SL</th><th>Name</th><th>ID</th><th>Dept</th><th>CGPA</th>";
    while($row = $result->fetch_assoc()) {
        if($row['dept'] != "CSE"){
            echo "<tr><td>$row[sl]</td><td>$row[name]</td><td>$row[id]</td>
                  <td>$row[dept]</td><td>$row[cgpa]</td></tr>";
        }
    }
    echo "</table>";
}
```

Useful Math & String Functions

- ceil(\$x): Round up (e.g. venues needed) | - floor(\$x): Round down

- pow(\$base, \$exp): Exponential | - sqrt(\$x): Square root

- number_format(\$num, 2): Formatting currency | - strlen(\$str): String length

Pattern: 1 + 2 + 3 + ... + n (Arithmetic)

```
$sum = 0; for($i=1; $i<=$n; $i++) { echo $i; $sum += $i; }
```

Pattern: 2 + 4 + 6 + ... + n (Even)

```
$sum = 0; for($i=2; $i<=$n; $i+=2) { echo $i; $sum += $i; }
```

Pattern: 1 + 3 + 9 + ... (Geometric)

```
$base = 1; for($i=1; $i<=$n; $i++) { echo $base; $base *= 3; }
```

Pattern: 1 + 3 + 11 + 123 (Next = Prev^2 + 2)

```
$base = 1; for($i=1; $i<=$n; $i++) { echo $base; $base = pow($base, 2) + 2; }
```

Pattern: Fibonacci (0, 1, 1, 2, 3, 5...)

```
$f1=0; $f2=1; for($i=0; $i<$n; $i++){ echo $f1; $next=$f1+$f2; $f1=$f2; $f2=$next; }4. Task: Average Salary (Age 50+)
```

Logic: Initialize \$sum and \$count outside. Divide \$sum by \$count at the end.

```
if ($result->num_rows > 0) {
    $sum = 0; $count = 0;
    while($row = $result->fetch_assoc()) {
        if($row['age'] >= 50){
            $sum = $sum + $row["salary"];
            $count++;
        }
    }
    if($count > 0) echo "Average salary: " . ($sum / $count);
    else echo "No records found.";
}
```

5. Task: Average Age (Complex Conditions)

Logic: Combine conditions using '&&'. Filter by CGPA and Salary.

```
if ($result->num_rows > 0) {
    $sum = 0; $count = 0;
    while($row = $result->fetch_assoc()) {
        if($row['cgpa'] > 3 && $row['salary'] >= 12000){
            $sum = $sum + $row["age"];
            $count++;
        }
    }
    if($count > 0) echo "Average age: " . ($sum / $count);
}
```

6. Essential SQL Snippets

- SELECT * FROM table WHERE condition;
- UPDATE table SET column = value WHERE condition;
- DELETE FROM table WHERE id = 5;
- INSERT INTO table (col1, col2) VALUES (val1, val2);
- ORDER BY column DESC (Largest first);
- LIMIT 1 (Get only the top record);

7. PHP Form Handling (HTML Integration)

```
<form action="" method="POST">
    <input type="number" name="n">
    <input type="submit" value="Calculate">
</form>
```

```
<?php
    if(isset($_POST['n'])){
        $n = $_POST['n']; // Get value from form
    }
?>
```

8. Array & Output Tips

- \$row['column_name']: Accesses data from the DB query.
- echo "Text " . \$variable; : String concatenation.
- ceil(\$a/\$b): Rounds up (Useful for 'how many venues' questions).
- count(\$array): Gets size of array.
- mysqli_close(\$conn): Closes the DB connection.