Question 1: Write a program to find whether a given number is a perfect number or not. A perfect number is a positive number that is equal to the sum of all its divisors (excluding itself). Example: Input: 28 Divisors: [1, 2, 4, 7, 14] Sum: 1 + 2 + 4 + 7 + 14 = 28 Output: 28 is a perfect number

Python code:

```
import math
def perfect_number(num):
    divisors= [1]
    sum_divisors= 1
    for i in range(2,math.isqrt(num)+1):
        if num%i== 0:
            divisors.append(i)
            sum_divisors+= i
            if i!=num// i:
                divisors.append(num//i)
                sum_divisors+=num//i
    divisors.sort()
    if sum_divisors== num:
        return True, divisors, sum_of_divisors
    else:
        return False, divisors, sum_of_divisors
number = int(input("Input: "))
is_perfect, divisors, sum_divisors = perfect_number(number)
if is_perfect:
    print("Divisors:", divisors)
    print("Sum:", ' + '.join(map(str, divisors)), "=", sum_of_divisors)
    print("Output:", number, "is a perfect number.")
else:
```

```
    print("Divisors:", divisors)
    print("Sum:", ' + '.join(map(str, divisors)), "=", sum_of_divisors)
    print("Output:", number, "is not a perfect number.")
```

Time Complexity : O(sqrt(n))

Another Approach :

```
n = int(input("Enter any number: "))
sum1 = 0
for i in range(1, n):
    if(n % i == 0):
        sum1 = sum1 + i
if (sum1 == n):
    print(n, " is a perfect number.")
else:
    print(n, " is not a perfect number.")
```

Time Complexity : O(n)

In [14]:
```
import math
def perfect_number(num):
    divisors= [1]
    sum_divisors= 1
    for i in range(2,math.isqrt(num)+1):
        if num%i== 0:
            divisors.append(i)
            sum_divisors+= i
            if i!=num// i:
                divisors.append(num//i)
                sum_divisors+=num//i
    divisors.sort()
    if sum_divisors== num:
        return True, divisors, sum_of_divisors
    else:
        return False, divisors, sum_of_divisors
number = int(input("Input: "))
is_perfect, divisors, sum_divisors = perfect_number(number)
if is_perfect:
    print("Divisors:", divisors)
    print("Sum:", ' + '.join(map(str, divisors)), "=", sum_of_divisors)
    print("Output:", number, "is a perfect number.")
else:
    print("Divisors:", divisors)
    print("Sum:", ' + '.join(map(str, divisors)), "=", sum_of_divisors)
    print("Output:", number, "is not a perfect number.")
```

```
Input: 14
Divisors: [1, 2, 7]
Sum: 1 + 2 + 7 = 28
Output: 14 is not a perfect number.
```

```
: n = int(input("Enter any number: "))
  sum1 = 0
  for i in range(1, n):
      if(n % i == 0):
          sum1 = sum1 + i
  if (sum1 == n):
      print(n, " is a perfect number.")
  else:
      print(n, " is not a perfect number.")
```

```
Enter any number: 28
28  is a perfect number.
```

Question 2: Consider the MySQL tables given below.

EmployeeInfo Table:

EmpID	EmpFname	EmpLname	Departmnt	Project	Address	DOB	Gender
1	Sanjay	Mehra	HR	P1	Hyderabad (HYD)	01/12/1976	M
2	Ananya	Mishra	Admin	P2	Delhi(DEL)	02/05/1968	F
3	Rohan	Diwan	Account	P3	Mumbai(BOM)	01/01/1980	M
4	Sonia	Kulkarni	HR	P1	Hyderabad (HYD)	02/05/1992	F
5	Ankit	Kapoor	Admin	P2	Delhi(DEL)	03/07/1994	M

EmployeePosition Table:

EmpID	EmpPosition	DateOfJoining	Salary
1	Manager	01/05/2022	500000
2	Executive	02/05/2022	75000
3	Manager	01/05/2022	90000
2	Lead	02/05/2022	85000
1	Executive	01/05/2022	300000

Based the table write queries

1) Write queries to create the tables given above and add data in to the table as given above.

2) Get the list of Employees with their first name, last name, department and position.

3) Get list of all projects and count of employees working in each project.

4) Get list of all positions and count of employees working in each position.

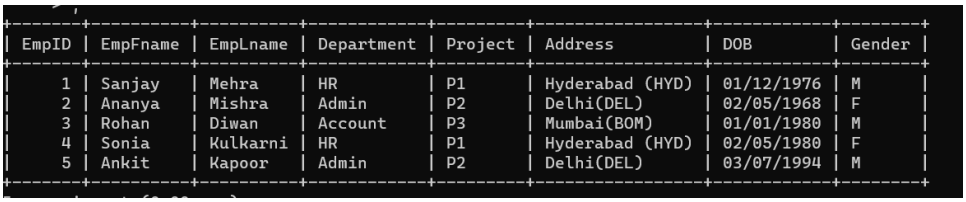
5) Find the employees getting the maximum and minimum salary.

1 Ans:

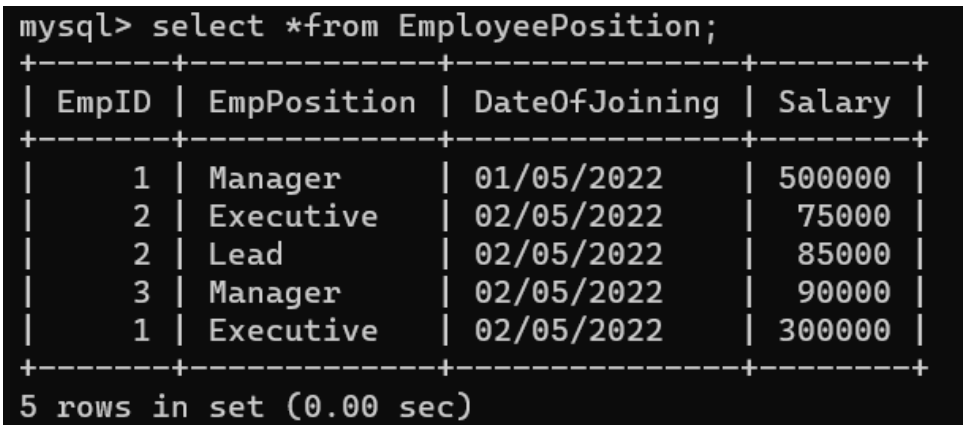
```
mysql>CREATE TABLE EmployeeInfo (
EmpID INT PRIMARY KEY,
EmpFname VARCHAR(255) NOT NULL,
EmpLname VARCHAR(255) NOT NULL,
Department VARCHAR(50) NOT NULL,
Project VARCHAR(50),
Address VARCHAR(255),
DOB VARCHAR(20),
Gender CHAR(1) NOT NULL
);
mysql>INSERT INTO EmployeeInfo (EmpID, EmpFname, EmpLname, Department, Project, Address, DOB, Gender)
VALUES (1, 'Sanjay', 'Mehra', 'HR', 'P1', 'Hyderabad (HYD)', '01/12/1976', 'M'),
    (2, 'Ananya', 'Mishra', 'Admin', 'P2', 'Delhi(DEL)', '02/05/1968', 'F'),
    (3, 'Rohan', 'Diwan', 'Account', 'P3', 'Mumbai(BOM)', '01/01/1980', 'M'),
    (4, 'Sonia', 'Kulkarni', 'HR', 'P1', 'Hyderabad (HYD)', '02/05/1992', 'F'),
    (5, 'Ankit', 'Kapoor', 'Admin', 'P2', 'Delhi(DEL)', '03/07/1994', 'M');
mysql>CREATE TABLE EmployeePosition (
```

```
  EmpID INT REFERENCES EmployeeInfo(EmpID) ,
  EmpPosition VARCHAR(255) NOT NULL,
  DateOfJoining varchar(10),
  Salary INT NOT NULL
);
```

mysql>INSERT INTO EmployeePosition (EmpID, EmpPosition, DateOfJoining, Salary)
VALUES (1, 'Manager', '01/05/2022', 500000),
(2, 'Executive', '02/05/2022', 75000),
(2, 'Lead', '02/05/2022', 85000),
(3, 'Manager', '02/05/2022', 90000),
(1, 'Executive', '02/05/2022', 300000);



EmpID	EmpFname	EmpLname	Department	Project	Address	DOB	Gender
1	Sanjay	Mehra	HR	P1	Hyderabad (HYD)	01/12/1976	M
2	Ananya	Mishra	Admin	P2	Delhi(DEL)	02/05/1968	F
3	Rohan	Diwan	Account	P3	Mumbai(BOM)	01/01/1980	M
4	Sonia	Kulkarni	HR	P1	Hyderabad (HYD)	02/05/1980	F
5	Ankit	Kapoor	Admin	P2	Delhi(DEL)	03/07/1994	M



```
mysql> select *from EmployeePosition;
+-------+-------------+---------------+--------+
| EmpID | EmpPosition | DateOfJoining | Salary |
+-------+-------------+---------------+--------+
|     1 | Manager     | 01/05/2022    | 500000 |
|     2 | Executive   | 02/05/2022    |  75000 |
|     2 | Lead        | 02/05/2022    |  85000 |
|     3 | Manager     | 02/05/2022    |  90000 |
|     1 | Executive   | 02/05/2022    | 300000 |
+-------+-------------+---------------+--------+
5 rows in set (0.00 sec)
```

2 Ans:

mysql>SELECT DISTINCT emp1.EmpFname, emp1.EmpLname, emp1.Department, emp2.EmpPosition

FROM EmployeeInfo AS emp1

LEFT JOIN EmployeePosition AS emp2 ON emp1.EmpID = emp2.EmpID;

EmpFname	EmpLname	Department	EmpPosition
Sanjay	Mehra	HR	Executive
Sanjay	Mehra	HR	Manager
Ananya	Mishra	Admin	Manager
Ananya	Mishra	Admin	Executive
Rohan	Diwan	Account	Lead
Sonia	Kulkarni	HR	NULL
Ankit	Kapoor	Admin	NULL

3 Ans:

mysql>SELECT Project, COUNT(EmpID) as EmployeeCount

FROM EmployeeInfo

GROUP BY Project;

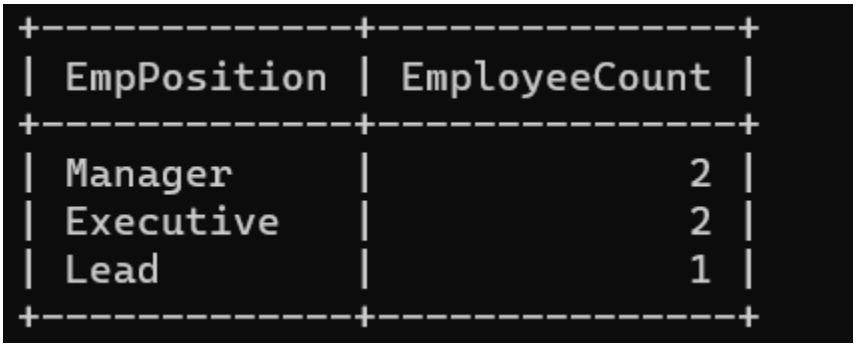
Project	EmployeeCount
P1	2
P2	2
P3	1

4 Ans:

mysql>SELECT EmpPosition, COUNT(EmpID) as EmployeeCount

FROM EmployeePosition

GROUP BY EmpPosition;



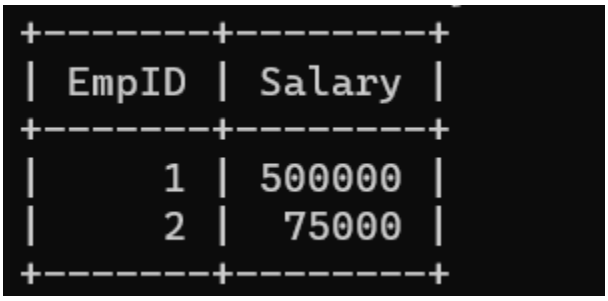
EmpPosition	EmployeeCount
Manager	2
Executive	2
Lead	1

5 Ans:

mysql>SELECT EmpID, EmpFname, EmpLname, Salary

FROM EmployeePosition

WHERE Salary IN ((SELECT MAX(Salary) FROM EmployeePosition), (SELECT MIN(Salary) FROM EmployeePosition));



EmpID	Salary
1	500000
2	75000

(or)

SELECT EmpID, Salary,

CASE

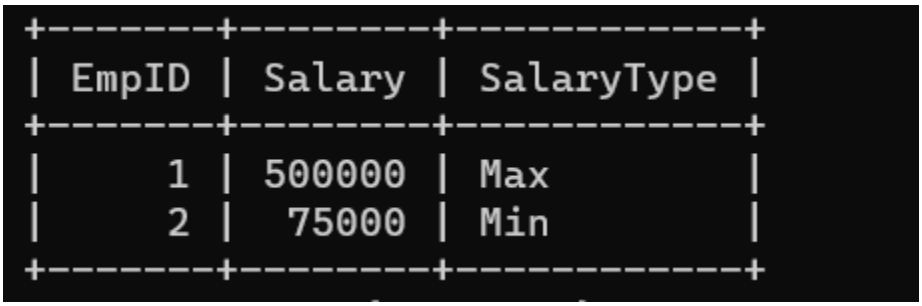
WHEN Salary = (SELECT MAX(Salary) FROM EmployeePosition) THEN 'Max'

WHEN Salary = (SELECT MIN(Salary) FROM EmployeePosition) THEN 'Min'

END as SalaryType

FROM EmployeePosition

WHERE Salary IN ((SELECT MAX(Salary) FROM EmployeePosition), (SELECT MIN(Salary) FROM EmployeePosition));



EmpID	Salary	SalaryType
1	500000	Max
2	75000	Min