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C07
SPP-II

Expriment No :- 4

Implement if-else, nested if, and switch-case (using dictionaries) for decision-making scenarios.

1. **Write a program to check whether a given number is positive, negative, or zero using if-else.**

Code :

```
num = float(input("Enter a number:
")) if num > 0:
   print("The number is positive.")
elif num < 0:
   print("The number is negative.")
else:
   print("The number is zero.")
```

Output :

```
Enter a number: 53
The number is positive.

=== Code Execution Successful ===
```

2. **Write a program to check whether a number is even or odd using if-else.**

Code :

```
num = int(input("Enter a number:
")) if num % 2 == 0:
   print("The number is even.")
else:
   print("The number is odd.")
```

Output :

```
Enter a number: 67
The number is odd.

=== Code Execution Successful ===
```

3. **Write a program to find the largest of three numbers using nested if statements.**

Code :

```
num1 = float(input("Enter first number: "))
num2 = float(input("Enter second
number")) num3 = float(input("Enter third
number: ")) if num1 >= num2:
if num1 >= num3:
largest = num1
else:
largest = num3
else:
if num2 >= num3:
largest = num2
else:
      largest = num3
print("The largest number is:",
largest)
```

Output :

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```
Enter first number: 46.87
Enter second number: 32.9
Enter third number: 108.9
The largest number is: 108.9

=== Code Execution Successful ===
```

4. **Write a program to determine the grade of a student based on marks using if-elif-else.**

Code :

```
marks = float(input("Enter your marks (0–
100):")) if marks >= 90:     grade = "A+" elif
marks >= 80:     grade = "A" elif marks >= 70:
grade = "B" elif marks >= 60:     grade = "C"
elif marks >= 50:     grade = "D" elif marks >=
40:     grade = "E" else:
   grade = "F (Fail)"
print("Your grade is:", grade)
```

Output :

```
Enter your marks (0-100): 73
Your grade is: B

=== Code Execution Successful ===
```

5. **Write a program to check whether a year is a leap year using if-else.**

Code :

```
year = int(input("Enter a year:
")) if (year % 4 == 0):     if
(year % 100 == 0):         if
(year % 400 == 0):
          print(f"{year} is a leap year.")
else:             print(f"{year} is not a
leap year.")     else:
       print(f"{year} is a leap year.")
else:
   print(f"{year} is not a leap year.")
```

Output :

```
Enter a year: 2004
2004 is a leap year.

=== Code Execution Successful ===
```

6. **Write a program to categorize age groups (child, teenager, adult, senior) using nested if.**

Code :

```
age = int(input("Enter your age:
")) if age >= 0:     if age <= 12:
       print("You are a
child.")     else:         if age
<= 19:
          print("You are a
teenager.")         else:             if
age <= 59:
             print("You are an adult.")
```

```
        else:
            print("You are a senior.")
else:
    print("Invalid age entered.")
```

Output :

```
Enter your age: 20
You are an adult.

=== Code Execution Successful ===
```

7. Write a program to calculate electricity bill based on units consumed using if-elif-else.

Code :

```
 units = float(input("Enter the number of units
consumed: ")) bill = 0 if units <= 50:
    bill = units * 3.50
elif units <= 150:
    bill = 50 * 3.50 + (units - 50) *
4.00 elif units <= 250:
    bill = 50 * 3.50 + 100 * 4.00 + (units - 150) * 5.20
else:
    bill = 50 * 3.50 + 100 * 4.00 + 100 * 5.20 + (units - 250) *
6.50 print(f"Total electricity bill: ₹{bill:.2f}")
```

Output :

```
Enter the number of units consumed: 275
Total electricity bill: ₹1257.50

=== Code Execution Successful ===
```

8. Write a program to determine the type of triangle (equilateral, isosceles, scalene) using nested if.

Code :

```
a = float(input("Enter side a: ")) b =
float(input("Enter side b: ")) c =
float(input("Enter side c: ")) if a + b
> c and b + c > a and c + a > b:
    if a == b:
if b == c:
            print("The triangle is
equilateral.")          else:
print("The triangle is isosceles.")
else:          if b == c or a == c:
            print("The triangle is isosceles.")
else:
            print("The triangle is
scalene.") else:
    print("The given sides do not form a valid triangle.")
```

Output :

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```
Enter side a: 4
Enter side b: 4
Enter side c: 6
The triangle is isosceles.

=== Code Execution Successful ===
```

9. **Write a program to print the day of the week based on a number input (1–7) using dictionarybased switch-case.**

Code :

```
day_number = int(input("Enter a number (1–7):
")) day_map = {    1: "Monday",    2: "Tuesday",
   3: "Wednesday",
   4: "Thursday",
   5: "Friday",
   6: "Saturday",
   7: "Sunday"
} day = day_map.get(day_number, "Invalid input! Please enter a number between 1
and 7.") print("Day of the week:", day)
```

Output :

```
Enter a number (1-7): 4
Day of the week: Thursday

=== Code Execution Successful ===
```

10. **Write a program to perform arithmetic operations (+, -, *, /) based on user input using dictionary-based switch-case.**

Code :

```
num1 = float(input("Enter first number: "))
num2 = float(input("Enter second number: "))
operator = input("Enter operator (+, -, *, /): ")
operations = {
   '+': lambda a, b: a + b,
   '-': lambda a, b: a - b,
   '*': lambda a, b: a * b,
   '/': lambda a, b: a / b if b != 0 else "Error: Division by zero"
} result = operations.get(operator, lambda a, b: "Invalid operator")(num1,
num2) print("Result:", result)
```

Output :

```
Enter first number: 36.22
Enter second number: 12.67
Enter operator (+, -, *, /): -
Result: 23.549999999999997

=== Code Execution Successful ===
```

11. **Write a program to check if a character is a vowel or consonant using if-else.**

Code :

```
char = input("Enter a single alphabet character:
").lower() if len(char) == 1 and char.isalpha():     if
char in ('a', 'e', 'i', 'o', 'u'):         print(f"{char} is a
```

```
vowel.")    else:        print(f"{char} is a consonant.")
else:
   print("Invalid input! Please enter a single alphabet letter.")
```

Output :

```
Enter a single alphabet character: o
o is a vowel.

=== Code Execution Successful ===
```

12. **Write a program to check whether a number is divisible by 2, 3, and 5 using nested if.**

Code :

```
num = int(input("Enter a number:
")) if num % 2 == 0:    if num % 3
== 0:        if num % 5 == 0:
          print(f"{num} is divisible by 2, 3, and 5.")
else:           print(f"{num} is divisible by 2 and 3, but
not by 5.")    else:        if num % 5 == 0:
          print(f"{num} is divisible by 2 and 5, but not by 3.")
else:
          print(f"{num} is divisible by 2 only.")
else:
   if num % 3 == 0:
if num % 5 == 0:
          print(f"{num} is divisible by 3 and 5, but not by
2.")       else:           print(f"{num} is divisible by 3
only.")    else:        if num % 5 == 0:
          print(f"{num} is divisible by 5 only.")
else:           print(f"{num} is not divisible by 2,
3, or 5.")
```

Output :

```
Enter a number: 30
30 is divisible by 2, 3, and 5.

=== Code Execution Successful ===
```

13. **Write a program to map months (1–12) to their names using dictionary-based switch-case.**

Code :

```
month_number = int(input("Enter a month number (1–12): "))
month_map = {
   1: "January",
   2: "February",
   3: "March",
   4: "April",
   5: "May",
6: "June",
   7: "July",
   8: "August",
   9: "September",
   10: "October",
   11: "November",
   12: "December"
```

} month_name = month_map.get(month_number, "Invalid input! Please enter a number between 1 and 12.")
print("Month name:", month_name)

Output :

```
Enter a month number (1-12): 4
Month name: April

=== Code Execution Successful ===
```

14. **Write a program to implement a simple menu (1. Add, 2. Subtract, 3. Multiply, 4. Divide) using dictionary-based switch-case.**

Code :

```
num1 = float(input("Enter first number: "))
num2 = float(input("Enter second number: ")) print("\nSelect operation:") print("1. Add") print("2. Subtract") print("3. Multiply") print("4. Divide") choice = int(input("Enter your choice (1–4): ")) menu = {
    1: lambda a, b: a + b,
    2: lambda a, b: a - b,
    3: lambda a, b: a * b,
    4: lambda a, b: a / b if b != 0 else "Error: Division by zero"
} result = menu.get(choice, lambda a, b: "Invalid choice")(num1, num2) print("Result:", result)
```

Output :

```
Enter first number: 23.56
Enter second number: 81.43

Select operation:
1. Add
2. Subtract
3. Multiply
4. Divide
Enter your choice (1-4): 1
Result: 104.99000000000001

=== Code Execution Successful ===
```

15. **Write a program to determine if a student is eligible for a scholarship based on multiple criteria (marks, attendance) using nested if.**

Code :

```
marks = float(input("Enter student's marks (out of 100): ")) attendance = float(input("Enter attendance percentage: ")) if marks >= 85:     if attendance >= 75:
        print("Student is eligible for the scholarship.")     else:         print("Not eligible: Attendance below 75%.") else:
    if attendance >= 75:
        print("Not eligible: Marks below 85.")     else:         print("Not eligible: Both marks and attendance are below required levels.")
```

Output :

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```
Enter student's marks (out of 100): 87
Enter attendance percentage: 80
Student is eligible for the scholarship.

=== Code Execution Successful ===
```