Name: Rajani Sankapal
Roll No: C-19
Cource No:SPP II(Python)

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

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

Name: Rajani Sankapal
Roll No: C-19
Cource No:SPP II(Python)

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:
```

Name: Rajani Sankapal
Roll No: C-19
Cource No:SPP II(Python)

```
print("You are an adult.")
```

Name: Rajani Sankapal
Roll No: C-19
Cource No:SPP II(Python)

```
        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.")
```

Name: Rajani Sankapal
Roll No: C-19
Cource No:SPP II(Python)

Output :

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

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

Name: Rajani Sankapal
Roll No: C-19
Cource No:SPP II(Python)

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

Name: Rajani Sankapal
Roll No: C-19
Cource No:SPP II(Python)

```
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
```

Name: Rajani Sankapal
Roll No: C-19
Cource No:SPP II(Python)

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 :

Name: Rajani Sankapal
Roll No: C-19
Cource No:SPP II(Python)

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

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