Conditional Structures

1. Write a program that prompts the user to input a number and display if the number is even or odd.

```python
num=int(input("Enter Number:"))
if num%2==0:
    print(f"{num} is an even number")
else:
    print(f"{num} is a odd number")

Enter Number: 5

5 is a odd number
```

2. Write a Python program that takes an age as input and determines whether a person is eligible to vote. If the age is 18 or above, print "You are eligible to vote." Otherwise, print "You are not eligible to vote yet.".

```python
age=int(input("Enter your age:"))
if age>=18:
    print("You are eligible to vote")
else:
    print("You are not eligible to vote yet")

Enter your age: 7

You are not eligible to vote yet
```

3. Write a program that prompts the user to input two integers and outputs the largest

```python
num1=int(input("Enter number 1:"))
num2=int(input("Enter number 2:"))
if num1>num2:
    print(f"{num1} is the largest of the two numbers")
else:
    print(f"{num2} is the largest of the two numbers")

Enter number 1: 70
Enter number 2: 89

89 is the largest of the two numbers
```

4. Write a program that prompts the user to enter a number and determines whether it is positive, negative, or zero. The program should print "Positive" if the number is greater than 0, "Negative" if the number is less than 0, and "Zero" if the number is 0.

```python
numb=int(input("Enter number:"))
if numb>0:
    print("Positive")
elif numb<0:
    print("Negative")
else:
    print("Zero")

Enter number: 0

Zero
```

5. Write a program that prompts the user to enter their age and prints the corresponding age group. The program should use the following age groups:

0-12: Child, 13-19: Teenager, 20-59: Adult, 60 and above: Senior Citizen

```python
age=int(input("Enter your age:"))
if age<=12:
    print("Child")
elif age<=19:
    print("Teenager")
elif age<=59:
    print("Adult")
else:
    print("Senior Citizen")

Enter your age: 3

Child
```

6. Write a program that prompts the user to input a number from 1 to 7. The program should display the corresponding day for the given number.

For example, if the user types 1, the output should be Sunday. If the user types 7, the output should be Saturday. If the number is not between 1 to 7 user should get error message as shown in sample output.

```python
numo=int(input("Enter number:"))
if numo==1:
```

```
    print("Sunday")
elif numo==2:
    print("Monday")
elif numo==3:
    print("Tuesday")
elif numo==4:
    print("Wednesday")
elif numo==5:
    print("Thursday")
elif numo==6:
    print("Friday")
elif numo==7:
    print("Saturday")
else:
    print("Error")

Enter number: 6

Friday
```

7. Write a program that prompts the user to enter their weight (in kilograms) and height (in meters).

The program should calculate the Body Mass Index (BMI) using the formula: BMI = weight / (height * height). The program should then classify the BMI into one of the following categories:

```
weight=float(input("Enter weight in kg:"))
height=float(input("Enter height in meters:"))
bmi=weight/height**2
if bmi<18.5:
    print("Underweight")
elif bmi<=24.9:
    print("Normal weight")
elif bmi<=29.9:
    print("Over weight")
else:
    print("Normal weight")

Enter weight in kg: 49
Enter height in meters: 1.79

Underweight
```

8. The marks obtained by a student in 3 different subjects are input by the user. Your program should calculate the average of subjects and display the grade. The student gets a grade as per the following rules:

Average Grade

90-100 A, 80-89 B, 70-79 C, 60-69 D, 0-59 F

```python
totalmarks=300
math=float(input("Enter marks of math"))
computer=float(input("Enter marks of computer"))
physics=float(input("Enter marks of physics"))
earnedmarks=math+computer+physics
perc=earnedmarks/totalmarks*100
if perc<=100 and perc>90:
    print("Grade A.")
elif perc<=89 and perc>80:
    print("Grade B.")
elif perc<=79 and perc>70:
    print("Grade C.")
elif perc<=69 and perc>60:
    print("Grade D.")
else:
    print("Grade F.")

Enter marks of math 98
Enter marks of computer 66
Enter marks of physics 34

Grade D.
```

9. The roots of the quadratic equation ax^2+ bx + c = 0, a ≠ 0 are given by the following formula

(- b plus/minus sqrt(b^2 - 4ac))/(2a)

In this formula, the term b^2 - 4ac is called the discriminant. If b^2 - 4ac = 0, then the equation has two equal roots. If b^2 - 4ac > 0, the equation has two real roots. If b^2 - 4ac < 0, the equation has two complex roots. Write a program that prompts the user to input the value of a (the coefficient of x^2), b (the coefficient of x), and c (the constant term) and outputs the roots of the quadratic equation.

```python
a=float(input("Enter value of a:"))
b=float(input("Enter value of b:"))
c=float(input("Enter value of c:"))
disc=b**2 - 4*a*c
if disc==0:
    print("The equation has two equal roots")
elif disc>0:
    print("The equation has two real roots")
else:
    print("The equation has two complex roots")

root1=(-b - disc**0.5)/(2*a)
root2=(-b + disc**0.5)/(2*a)
```

```
print(f"The roots of these Quadratic Equations are {root1} and
{root2}")

Enter value of a: 4
Enter value of b: 2
Enter value of c: 3

The equation has two complex roots
The roots of these Quadratic Equations are (-0.25000000000000006-
0.82915619758885j) and (-0.24999999999999994+0.82915619758885j)
```

11. Write a program that prompts the user to input three integers and outputs the largest.

```python
numb1=int(input("Enter number 1"))
numb2=int(input("Enter number 2"))
numb3=int(input("Enter number 3"))
if numb1>numb2 and numb1>numb3 and numb2>numb3:
    print(f"{numb1} \n {numb2} \n {numb3}")
elif numb2>numb1 and numb2>numb3 and numb1>numb3:
    print(f"{numb2} \n {numb1} \n {numb3}")
elif numb3>numb1 and numb3>numb2 and numb2>numb1:
    print(f"{numb3}\n{numb2}\n{numb1}")

Enter number 1 12232
Enter number 2 3233222123312
Enter number 3 12

3233222123312
 12232
 12
```

12. Write a program that prompts the user to input a character and determine the character is vowel or consonant.

```python
vowels=['a','e','i','o','u']
char=input("Enter a character")
if char in vowels:
    print(f"{char} is a vowel")
else:
    print(f"{char} is a consonant")

Enter a character o

o is a vowel
```

13. Write a program that prompts the user to input a year and determine whether the year is a leap year or not.

Leap Years are any year that can be evenly divided by 4. A year that is evenly divisible by 100 is a leap year only if it is also evenly divisible by 400.

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

Enter year 2028

2028 is a leap year
```

14. Write a program that prompts the user to input number of calls and calculate the monthly telephone bills as per the following rule:

Minimum Rs. 200 for up to 100 calls. Plus Rs. 0.60 per call for next 50 calls. Plus Rs. 0.50 per call for next 50 calls. Plus Rs. 0.40 per call for any call beyond 200 calls.

```python
base=200
add=0
calls=int(input("Enter number of calls"))
if calls<=100:
    pass
elif calls<=150:
    add=0.60*50
    base+=add
elif calls<=200:
    add=0.50*50
    base+=add
else:
    add=0.40*50
    base+=add
print(f"""              --------------------
            Number of calls:{calls}
            Total monthly bill:{base}
            --------------------""")

Enter number of calls 160
```

```
--------------------
Number of calls:160
Total monthly bill:225.0
--------------------
```