PF LAB 04

Q1. Write a C program to take an integer as input and check if it is:

- Positive
- Negative
- Zero

SOURCE CODE:

```c
#include<stdio.h>
int main()
{
    int number;

    printf("Enter a Number: ");
    scanf("%d",&number);

    if(number>0)
    {
        printf("The number you entered is POSITIVE");
    }
    else if(number<0)
    {
        printf("The number you entered is NEGATIVE");
    }
    else
    {
        printf("The number you entered is ZERO");
    }
}
```

OUTPUT:

```
Enter a Number: 5
The number you entered is POSITIVE
```

```
Enter a Number: -8
The number you entered is NEGATIVE
```

```
Enter a Number: 0
The number you entered is ZERO
```

Q2. Write a C program that asks the user to enter:

- Two numbers
- An operator (+, -, *, /)

Use a switch statement to perform the correct operation and display the result.

SOURCE CODE:

```c
#include<stdio.h>
int main()
{
    int num1,num2,sum,prod,diff;
    float div;
    char opt;

    printf("Enter first number: ");
    scanf("%d",&num1);

    printf("Enter second number: ");
    scanf("%d",&num2);

    printf("Enter an operator: ");
    scanf(" %c",&opt);

    switch(opt)
    {
        case '+':

            sum=num1+num2;
            printf("Sum is equal to %d",sum);
            break;

        case '-':
            diff=num1-num2;
            printf("Difference is equal to %d",diff);
            break;

        case '*':
            prod=num1*num2;
            printf("Product is equal to %d",prod);
            break;

        case '/':
            if (num2 != 0) {
                div = (float)num1 / num2;
                printf("Division is equal to %f\n", div);
            } else {
                printf("Error! Division by zero.\n");
            }
            break;

        default:
            printf("Wrong Operator");
            break;
    }
        return 0;
}
```

OUTPUT:

```
Enter first number: 4
Enter second number: 2
Enter an operator: /
Division is equal to 2.000000
```

Q3. Flood Relief Assistance
Due to the 2025 Pakistan floods, the government is distributing relief packages based on water levels:

Write a C program that takes the water level as input and prints the appropriate message.

Water Level (ft)	Action
Less than 2 ft	"No Relief Required"
2 – 4 ft	"Small Relief Package"
4 – 6 ft	"Medium Relief Package"
Above 6 ft	"Evacuation Required"

SOURCE CODE:

```c
#include<stdio.h>
int main()
{
    int waterlevel;

    printf("Enter flood water level: ");
    scanf("%d",&waterlevel);

    if(waterlevel<2)
    {
        printf("No Relief Required");
    }
    else if(waterlevel>=2 && waterlevel<=4)
    {
        printf("Small Relief Package");
    }
    else if(waterlevel>=4 && waterlevel<=6)
    {
        printf("Medium Relief Package");
    }
    else
    {
        printf("Evacuation Required");
    }

    return 0;
}
```

OUTPUT:

```
Enter flood water level: 5
Medium Relief Package
--------------------------------
```

Q4. Write a C program to take an integer from the user and check if the number is even or odd using the if-else statement.

SOURCE CODE:

```c
#include<stdio.h>
int main()
{
    int num;

    printf("Enter a number: ");
    scanf("%d",&num);

    if(num%2==0)
    {
        printf("The number your entered is EVEN");
    }
    else
    {
        printf("The number your entered is ODD");
    }

    return 0;
}
```

OUTPUT:

```
Enter a number: 6
The number your entered is EVEN
--------------------------------
```

```
Enter a number: 3
The number your entered is ODD
--------------------------------
```

Q5. Write a C program to input a student's marks (out of 100) and assign a grade:

Marks	Grade
85 – 100	A
70 – 84	B
55 – 69	C
40 – 54	D
Below 40	F

SOURCE CODE:

```c
#include<stdio.h>
int main()
{
    int marks;

    printf("Enter your marks out of 100: ");
    scanf("%d",&marks);

    if(marks>=85 && marks<=100)
    {
        printf("Your grade is A");
    }
    else if(marks>=70 && marks<=84)
    {
        printf("Your grade is B");
    }
    else if(marks>=55 && marks<=69)
    {
        printf("Your grade is C");
    }
    else if(marks>=40 && marks<=54)
    {
        printf("Your grade is D");
    }
    else if(marks<0 || marks>100)
    {
        printf("Incorrect marks");
    }
    else
    {
        printf("Your grade is F");
    }

    return 0;
}
```

OUTPUT:

```
Enter your marks out of 100: 85
Your grade is A
--------------------------------
```

Q6. Write a C program to input three integers and determine the largest number using if-else-if statements.

SOURCE CODE:

```c
#include<stdio.h>
int main()
{
    int num1,num2,num3;

    printf("Enter First Integer: ");
    scanf("%d",&num1);

    printf("Enter Second Integer: ");
    scanf("%d",&num2);

    printf("Enter Third Integer: ");
    scanf("%d",&num3);

    if(num1>num2 && num1>num3)
    {
        printf("Largest number is %d",num1);
    }
    else if(num2>num1 && num2>num3)
    {
        printf("Largest number is %d",num2);
    }
    else
    {
        printf("Largest number is %d",num3);
    }

    return 0;
}
```

OUTPUT:

```
Enter First Integer: 8
Enter Second Integer: 5
Enter Third Integer: 6
Largest number is 8
--------------------------------
```

Q7. Write a C program that calculates the electricity bill based on the following criteria:

Units Consumed	Rate per Unit (PKR)
Up to 100 units	10
101 – 300 units	15
301 – 500 units	20
Above 500 units	25

The program should ask the user for the number of units and calculate the total bill.

SOURCE CODE:

```c
#include<stdio.h>
int main()
{
    int units,bill;

    printf("Enter your units: ");
    scanf("%d",&units);

    if(units<=100)
    {
        bill=units*10;
        printf("Your BILL is %d",bill);
    }
    else if(units>=101 && units<=300)
    {
        bill=units*15;
        printf("Your BILL is %d",bill);
    }
    else if(units>=301 && units<=500)
    {
        bill=units*20;
        printf("Your BILL is %d",bill);
    }
    else
    {
        bill=units*25;
        printf("Your BILL is %d",bill);
    }

    return 0;
}
```

OUTPUT:

```
Enter your units: 600
Your BILL is 15000
--------------------------------
```

Q8. Write a C program that:

- Takes two numbers and an operator (+, -, *, /, %, ^).
- Uses a switch statement to perform:
  Addition, subtraction, multiplication, division, modulus, and power.
- Handle invalid operators and division by zero

SOURCE CODE:

```c
#include<stdio.h>
#include<math.h>
int main()
{
    int num1,num2,sum,prod,diff,mod,power;
    float div;
    char opt;

    printf("Enter first number: ");
    scanf("%d",&num1);

    printf("Enter second number: ");
    scanf("%d",&num2);

    printf("Enter an operator: ");
    scanf(" %c",&opt);

    switch(opt)
    {
        case '+':

            sum=num1+num2;
            printf("Sum is equal to %d",sum);
            break;

        case '-':
            diff=num1-num2;
            printf("Difference is equal to %d",diff);
            break;

        case '*':
            prod=num1*num2;
            printf("Product is equal to %d",prod);
            break;

        case '/':
            if (num2 != 0) {
                div = (float)num1 / num2;
                printf("Division is equal to %f\n", div);
            } else {
                printf("Error! Division by zero.\n");
            }
            break;

        case '%':
            mod=num1%num2;
            printf("Modulus is equal to: %d");
            break;

        case '^':
            power= pow (num1,num2);
            printf("Result is %d",power);
            break;

        default:
            printf("Wrong Operator");
            break;
    }

    return 0;
}
```

OUTPUT:

```
Enter first number: 2
Enter second number: 2
Enter an operator: ^
Result is 4
--------------------------------
```

Q9. The National Disaster Management Authority (NDMA) predicts flood risk levels based on rainfall and river flow:

Rainfall (mm)	River Flow (m3/s)	Risk Level
< 50	< 200	"Low Risk"
50 – 100	200 – 500	"Moderate Risk"
100 – 150	500 – 800	"High Risk"
> 150	> 800	"Severe Risk – Evacuate!"

- Write a C program that takes rainfall and river flow as inputs and displays the risk level accordingly.

SOURCE CODE:

```c
#include<stdio.h>
int main()
{
    int rainfall,riverflow;

    printf("Enter Rain Fall in mm: ");
    scanf("%d",&rainfall);

    printf("Enter River Flow: ");
    scanf("%d",&riverflow);

    if(rainfall<50 && riverflow<200)
    {
        printf("Low Risk");
    }
    else if((rainfall>=50 && rainfall<=100) && (riverflow>=200 && riverflow<=500))
    {
        printf("Moderate Risk");
    }
    else if((rainfall>=101 && rainfall<=150) && (riverflow>=501 && riverflow<=800))
    {
        printf("High Risk");
    }
    else if(rainfall>150 && riverflow>800)
    {
        printf("Severe Risk - Evacuate!");
    }

    return 0;
}
```

OUTPUT:

```
Enter Rain Fall in mm: 60
Enter River Flow: 250
Moderate Risk
--------------------------------
```

Q10. A Research Center wants to design a C program that evaluates a person's Islamic character based on multiple parameters. The system assigns a Character Index (CI) from 0 to 100 using the following formula:

Character Index (CI) Formula:

$$CI = (Akhlaq \times 2.5) + (Honesty \times 2.0) + (Prayer \times 15) + (Fasting \times 5) + (Zakat \times 1.0) + (Social \times 1.0) + (Conflict \times 1.0)$$

Task:

- Write a C program to:

1. Take user input for all the above attributes.
2. Calculate the Character Index (CI) using the formula.
3. Display the Classification and Remarks based on CI.
4. Use if–else-if ladders and nested conditions.

SOURCE CODE:

```
int main()
{
    int akhlaq,honesty,prayer,fast,zakat,social,conflict;
    float ci;

    printf("Enter your Akhlaq & Manner score (0-10): ");
    scanf("%d",&akhlaq);

    printf("Enter your Honesty & Trustworthiness score(0-10): ");
    scanf("%d",&honesty);

    printf("Enter your Prayer Regularity score(0=irregular,1=regular): ");
    scanf("%d",&prayer);

    printf("Enter your Fasting (Sawm)(0=never,1=sometimes,2=always): ");
    scanf("%d",&fast);

    printf("Enter your Zakat & Charity score (0-10): ");
    scanf("%d",&zakat);

    printf("Enter your Social Behavior score(0-10): ");
    scanf("%d",&social);

    printf("Enter your Conflict Resolution Skills score(0-10): ");
    scanf("%d",&conflict);

    ci=(float) (akhlaq*2.5)+(honesty*2.0)+(prayer*15)+(fast*5)+(zakat*1.0)+(social*1.0)+(conflict*1.0);
```

```
    if(ci>=85 && ci<=100)
    {
        printf("Excellent Muslim Character  \nRole model for society");
    }
    else if(ci>=70 && ci<=84)
    {
        printf("Good Muslim Character \nPracticing believer");
    }
    else if(ci>=50 && ci<=69)
    {
        printf("Average Character \nNeeds minor improvement");
    }
    else if(ci>=30 && ci>=49)
    {
        printf("Needs Improvement \nWork on Akhlaq & Ibadah");
    }
    else
    {
        printf("Weak Character \nRequires serious guidance");
    }

    return 0;
}
```

OUTPUT:

```
Enter your Akhlaq & Manner score (0-10): 8
Enter your Honesty & Trustworthiness score(0-10): 8
Enter your Prayer Regularity score(0=irregular,1=regular): 1
Enter your Fasting (Sawm)(0=never,1=sometimes,2=always): 2
Enter your Zakat & Charity score (0-10): 9
Enter your Social Behavior score(0-10): 7
Enter your Conflict Resolution Skills score(0-10): 7
Good Muslim Character
Practicing believer
--------------------------------
```