

## Programs-20-Dec-2024

**Q1 Equality Check:** Write a program to check if two integers provided by the user are equal or not.

```
#include<stdio.h>

int main()
{
    int n1,n2;
    printf("Enter 2 numbers");
    scanf("%d %d",&n1,&n2);
    if(n1==n2)
        printf("Numbers are equal");
    else
        printf("Numbers are not equal");

    return 0;

}
```

**Q2 Greater Number Identification:**

Write a program to determine which of two numbers is greater using relational operators.

```
#include <stdio.h>

int main() {
    int n1, n2;
    printf("Enter the first number: ");
    scanf("%d", &n1);

    printf("Enter the second number: ");
    scanf("%d", &n2);

    if (n1 > n2) {
        printf("The first number %d is greater.\n", n1);
    }
}
```

```

    } else if (n1 < n2) {
        printf("The second number %d is greater.\n", n2);
    } else {
        printf("Both numbers are equal.\n");
    }

    return 0;
}

```

### Q3 Check if a Number is Positive:

Use relational operators to check if a given number is positive (greater than 0).

```

#include <stdio.h>

int main() {
    int num;

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

    if (num > 0) {
        printf("The number %d is positive.\n", num);
    } else if (num < 0) {
        printf("The number is negative.\n");
    } else {
        printf("The number is zero.\n");
    }

    return 0;
}

```

### Q4 Rectangle Validity Check:

Write a program to verify if the given length and breadth of a rectangle satisfy the condition of a valid rectangle (length > 0 and breadth > 0).

```

#include <stdio.h>

int main() {
    float length, breadth;

    printf("Enter the length of the rectangle: ");
    scanf("%f", &length);

    printf("Enter the breadth of the rectangle: ");
    scanf("%f", &breadth);

    if (length > 0 && breadth > 0) {
        printf("The dimensions are valid for a rectangle.\n");
    } else {
        printf("Invalid.\n");
    }

    return 0;
}

```

#### Q5 **Grade Eligibility Check:**

Given a student's marks in a subject, determine if the student has passed (marks  $\geq 40$ )

```

#include <stdio.h>

int main() {
    float marks;

    printf("Enter the marks obtained by the student: ");
    scanf("%f", &marks);

    if (marks  $\geq$  40) {
        printf("The student passed.\n");
    } else {
        printf("The student failed.\n");
    }
}

```

```
    return 0;
}
```

#### Q6 Check if Number is Within Range:

Use relational operators to check if a given number lies between 10 and 50 (inclusive).

```
#include <stdio.h>

int main() {
    int number;
    printf("Enter a number: ");
    scanf("%d", &number);
    if (number >= 10 && number <= 50) {
        printf("The number %d is within the range\n", number);
    } else {
        printf("The number %d is not within the range\n", number);
    }
    return 0;
}
```

#### Q7 Verify Alphabetic Range:

Write a program to check if a given character is a lowercase English letter (between 'a' and 'z').

```
#include <stdio.h>

int main() {
    char ch;
    printf("Enter a character: ");
    scanf("%c", &ch);

    if (ch >= 'a' && ch <= 'z') {
        printf("The character '%c' is lowercase\n", ch);
    } else {
        printf("The character '%c' is not lowercase.\n", ch);
    }
}
```

```
    return 0;
}
```

#### **Q8 Age Comparison:**

Compare the ages of two people and determine who is older or if both are of the same age.

```
#include <stdio.h>
```

```
int main() {
    int age1, age2;

    printf("Enter the age of the first person: ");
    scanf("%d", &age1);
    printf("Enter the age of the second person: ");
    scanf("%d", &age2);
    if (age1 > age2) {
        printf("The first person is older.\n");
    } else if (age1 < age2) {
        printf("The second person is older.\n");
    } else {
        printf("Both persons are of the same age.\n");
    }

    return 0;
}
```

#### **Q9 Weight Limit Check:**

Write a program to determine if the weight of an object exceeds the specified maximum limit (e.g., 50 kg).

```
#include <stdio.h>
```

```
int main() {
    float weight;

    printf("Enter the weight");
```

```

scanf("%f", &weight);
if (weight > 50) {
    printf("The weight exceeds the maximum limit\n");
} else {
    printf("The weight is within the limit.\n");
}
return 0;
}

```

#### Q10 **Rectangle Larger Area Check:**

Compare the areas of two rectangles given their lengths and breadths and determine which rectangle has a larger area.

```

#include <stdio.h>

int main(){
    int l1,b1,l2,b2,area1,area2;

    printf("Enter l1 and b1\n");
    scanf("%d %d",&l1,&b1);
    area1=l1*b1;
    printf("Area1=%d\n",area1);

    printf("Enter l2 and b2\n");
    scanf("%d %d",&l2,&b2);
    area2=l2*b2;
    printf("Area2=%d\n",area2);

    if(area1<area2)
        printf("Second rectangle has larger area \n");
    else if(area1>area2)
        printf("First rectangle has larger area \n");
    else
        printf("Both has same area \n");
}

```

```
return 0;
```

```
}
```

Q11 Write a program to compute the result of the bitwise AND operation between two integers provided by the user.

```
#include <stdio.h>
```

```
int main() {
```

```
    int n1, n2, result;
```

```
    printf("Enter the first integer: ");
```

```
    scanf("%d", &n1);
```

```
    printf("Enter the second integer: ");
```

```
    scanf("%d", &n2);
```

```
    result = n1 & n2;
```

```
    printf(" %d & %d = %d\n", n1, n2, result);
```

```
    return 0;
```

```
}
```

Q12 Write a program to compute the result of the bitwise OR operation between two integers provided by the user.

```
#include <stdio.h>
```

```
int main() {
```

```
    int n1, n2, result;
```

```
    printf("Enter the first integer: ");
```

```
    scanf("%d", &n1);
```

```
    printf("Enter the second integer: ");
```

```
    scanf("%d", &n2);
```

```
    result = n1 | n2;
```

```
    printf(" %d | %d = %d\n", n1, n2, result);
```

```
    return 0;
```

```
}
```

Q13 Write a program to compute the result of the bitwise XOR operation between two integers provided by the user.

```
#include <stdio.h>

int main() {
    int n1, n2, result;
    printf("Enter the first integer: ");
    scanf("%d", &n1);

    printf("Enter the second integer: ");
    scanf("%d", &n2);
    result = n1 ^ n2;

    printf(" %d ^ %d = %d\n", n1, n2, result);

    return 0;
}
```

Q14 Write a program to find the bitwise complement of a given integer and print the result

```
#include <stdio.h>

int main() {
    int n1, complement;
    printf("Enter the integer: ");
    scanf("%d", &n1);
    complement = ~ n1;

    printf(" ~ %d = %d\n", n1, complement);

    return 0;
}
```



Q15 Given an integer n and a position p, write a program to toggle the bit at position p using the XOR operator.

```
#include <stdio.h>

int main() {
    int n, p, result;

    printf("Enter an integer: ");
    scanf("%d", &n);

    printf("Enter the bit position to toggle ");
    scanf("%d", &p);
    result = n ^ (1 << p);
    printf("The number after toggling: %d\n", result);

    return 0;
}
```

Q16 Write a program to set the bit at a given position p in an integer n to 1 using the OR operator.

```
#include <stdio.h>

int main() {
    int n, p, result;

    printf("Enter an integer: ");
    scanf("%d", &n);

    printf("Enter the bit position to set ");
    scanf("%d", &p);
    result = n | (1 << p);
    printf("The number after setting the bit: %d\n", result);

    return 0;
}
```

Q17 Write a program to clear (set to 0) the bit at a given position p in an integer n using the AND and NOT operators.

```
#include <stdio.h>

int main()
{
    int n, p, result;
    printf("Enter an integer: ");
    scanf("%d", &n);

    printf("Enter the bit position to clear ");
    scanf("%d", &p);
    result = (~ (1<<p))&n;
    printf("The number after clearing the bit: %d\n", result);
    return 0;
}
```

**1. Number Properties Validation:**

Write a program to check if a given integer is both a multiple of 5 (arithmetic operator) and greater than 50 (relational operator). Additionally, verify if its binary representation has its least significant bit set (bitwise AND operation).

```
#include <stdio.h>

int main()
{
    int n, result;

    printf("Enter an integer: \n");
    scanf("%d", &n);

    if(n%5==0 && n>50)
    {
        printf("%d is a multiple of 5 and is greater than 50\n",n);

        if(n&1)
```

```

printf("LSB is set\n");

else

printf("LSB is clear\n");

}

else

printf("Not meeting the conditions");

return 0;

}

```

## 2. **Toggle and Evaluate Bit Status:**

Given an integer n and a bit position p:

- Use bit masking and bitwise XOR to toggle the bit at position p.
- After toggling, check if the updated number is positive (arithmetic and relational operators) and divisible by 2 (logical operators).

```
#include <stdio.h>
```

```
int main() {
```

```
    int n, p, result;
```

```
    printf("Enter an integer: ");
```

```
    scanf("%d", &n);
```

```
    printf("Enter the bit position to toggle ");
```

```
    scanf("%d", &p);
```

```
    result = n ^ (1 << p);
```

```
    printf("The number after toggling the bit: %d\n", result);
```

```
    if (result == 0)
```

```
        printf("The number is zero.\n");
```

```
    else if (result > 0 && result % 2 == 0)
```

```

    printf("The number is positive and divisible by 2.\n");

else if (result > 0 && result % 2 != 0)

    printf("The number is positive but not divisible by 2.\n");

else if (result < 0 && result % 2 == 0)

    printf("The number is negative and divisible by 2.\n");

else

    printf("The number is negative and not divisible by 2.\n");

return 0;

}

```

### 3. **Determine Voting Eligibility with Criteria:**

A person can vote if:

- Their age is greater than or equal to 18 (relational operator).
- They are a registered citizen, represented by a specific bit set in their ID number (bit masking and bitwise AND).

Write a program to verify these conditions using logical operators.

```

#include <stdio.h>

int main()

{

    int age,id_num, p=4;

    printf("Enter the age\n");

    scanf("%d",&age);

    printf("Enter Id number\n");

    scanf("%d",&id_num);

    if(age>=18 && id_num&(1<<p))

        printf("Eligible for voting");

    else if(age<18 && id_num&(1<<p))

        printf("Not eligible for voting");

    else if(id_num&(1<<p))

```

```

    printf("Registered citizen");

else

    printf("Not registered citizen");


return 0;

}

```

#### 4. Set, Clear, and Check Specific Bit:

Write a program to:

- Use bit masking and bitwise OR to set a specific bit in a number.
- Use bitwise AND and NOT to clear another specific bit.
- Check if the resulting number is odd (arithmetic and relational operators) and lies within a range (logical operators).

```

#include <stdio.h>

int main() {

    int number, set_bit_position, clear_bit_position;

    int result;

    printf("Enter an integer: ");

    scanf("%d", &number);

    printf("Enter the bit position to set: ");

    scanf("%d", &set_bit_position);

    result = number | (1 << set_bit_position);

    printf("Number after setting the bit at position %d: %d\n", set_bit_position, result);

    printf("Enter the bit position to clear: ");

    scanf("%d", &clear_bit_position);

    result = result & ~(1 << clear_bit_position);

```

```

printf("Number after clearing the bit at position %d: %d\n", clear_bit_position, result);

if (result % 2 != 0 && result >0 && result <= 100) {

    printf("The number is odd and lies within the range\n");

} else if (number % 2 != 0) {

    printf("The number is odd but does not lie within the range\n");

} else {

    printf("The number is not odd.\n");

}

return 0;

}

```

### 5. Custom Mathematical Condition with Bits:

Given two integers a and b, perform the following:

- Compute their sum and product (arithmetic operators).
- Verify if the sum is greater than 100 and the product is divisible by 4 (relational and logical operators).
- Check if the binary representation of a has its second bit set (bitwise AND with a mask).

```

#include <stdio.h>

int main()
{
    int a,b,sum,product;
    printf("Enter a\n");
    scanf("%d",&a);
    printf("Enter b\n");
    scanf("%d",&b);
    if(a&(1<<2))
        printf("Second bit of %d is set\n",a);
    else
        printf("Second bit of %d clear\n",a);
}

```

```

sum=a+b;
product=a*b;
if(sum>100 && product%4==0)
printf("Meet conditions");
else
printf("Not under conditions");
return 0;
}

```

### Control Statements Examples:

#### Q1 Check for Positivity:

Write a program to check if a number entered by the user is positive using an **if** statement.

```

#include <stdio.h>

int main()
{
    int a;
    printf("Enter a number");
    scanf("%d",&a);
    if(a>0)
        printf("Number is positive");
    if(a<0)
        printf("Number is negative");
    if(a==0)
        printf("Number is zero");
    return 0;
}

```

#### Q2 Divisibility Check:

Write a program to check if a number is divisible by 3 using an **if** statement.

```

#include <stdio.h>

int main()
{

```

```

int a;

printf("Enter a number");

scanf("%d",&a);

if(a%3==0)

printf("Number is divisible by 3");

if(a%3!=0)

printf("Number is not divisible by 3");


return 0;
}

```

## **If-Else Statements**

### **Q3 Odd or Even:**

Write a program to determine if a number is odd or even using an **if-else** statement.

```

#include <stdio.h>

int main()

{

    int a;

    printf("Enter a number");

    scanf("%d",&a);

    if(a%2==0)

    printf("Number is even");

    else

    printf("Number is odd");

    return 0;

}

```

### **Q4 Passing Criteria:**

Write a program to check if a student has passed an exam based on their marks (pass marks are 40). If the marks are below 40, display "Fail."



```

#include <stdio.h>

int main() {

    float marks;

    printf("Enter the marks obtained by the student: ");

    scanf("%f", &marks);


    if (marks >= 40 && marks<=100) {

        printf("Pass\n");

    } else if(marks>100) {

        printf("Invalid\n");

    }

    else

        printf("Fail\n");

    return 0;

}

```

#### Q5     **If-Else-If Ladder**

##### **Grade Calculator:**

Write a program to calculate and print the grade of a student based on their percentage using an **if-else-if ladder**:

- = 90: Grade A
- = 75: Grade B
- = 50: Grade C
- < 50: Fail

```

#include <stdio.h>

int main() {

    float percentage;

    printf("Enter the percentage of the student: ");

    scanf("%f", &percentage);

```

```

if (percentage >= 90) {
    printf("Grade: A\n");
} else if (percentage >= 75) {
    printf("Grade: B\n");
} else if (percentage >= 50) {
    printf("Grade: C\n");
} else {
    printf("Grade: Fail\n");
}

return 0;
}

```

#### Q6 **Number Classification:**

Write a program to classify an integer as positive, negative, or zero using an **if-else-if ladder**.

```

#include <stdio.h>

int main() {
    int number;

    printf("Enter an integer: ");
    scanf("%d", &number);

    if (number > 0) {
        printf("The number is positive.\n");
    } else if (number < 0) {
        printf("The number is negative.\n");
    } else {
        printf("The number is zero.\n");
    }
}

```

```
return 0;
```

```
}
```

#### Q7 Electricity Bill Calculation:

Write a program to calculate the electricity bill based on the number of units consumed using the following criteria:

- Units  $\leq 100$ : ₹5 per unit
  - Units  $> 100$  and  $\leq 200$ : ₹7 per unit
  - Units  $> 200$ : ₹10 per unit
- Use an **if-else-if ladder** to implement this.

```
#include <stdio.h>
```

```
int main() {
```

```
    int units,amount;
```

```
    printf("Enter units consumed: ");
```

```
    scanf("%d", &units);
```

```
    if (units>100 && units<=200 ) {
```

```
        amount=7*units;
```

```
        printf("amount=%d\n",amount);
```

```
    } else if (units < 100) {
```

```
        amount=5*units;
```

```
        printf("amount=%d\n",amount);
```

```
    } else if(units > 200){
```

```
        amount=10*units;
```

```
        printf("amount=%d\n",amount);
```

```
    }
```

```
else

{

    printf("Invalid");

}


return 0;

}
```

#### Q8 Day of the Week:

Write a program to print the name of the day of the week based on a number entered by the user (1 for Monday, 2 for Tuesday, ..., 7 for Sunday) using an **if-else-if ladder**.

```
#include<stdio.h>

int main() {

    int day;

    printf("Enter a number (1-7) to get the day of the week: ");

    scanf("%d", &day);

    if (day == 1) {

        printf("Monday\n");

    } else if (day == 2) {

        printf("Tuesday\n");

    } else if (day == 3) {

        printf("Wednesday\n");

    } else if (day == 4) {

        printf("Thursday\n");

    } else if (day == 5) {

        printf("Friday\n");

    } else if (day == 6) {
```

```

        printf("Saturday\n");
    } else if (day == 7) {
        printf("Sunday\n");
    } else {
        printf("Invalid input\n");
    }

    return 0;
}

```

#### Q9 Nested If-Else Statements

##### **Triangle Type Checker:**

Given the lengths of three sides, write a program to determine if the triangle is valid using nested **if-else**. If valid, check if it is an equilateral triangle.

```
#include <stdio.h>
```

```

int main() {
    float a, b, c;

    printf("Enter the lengths of three sides of the triangle:\n");

    scanf("%f %f %f", &a, &b, &c);

    if (a + b > c && b + c > a && a + c > b) {
        printf("The triangle is valid.\n");

        if (a == b && b == c) {
            printf("It is an equilateral triangle.\n");
        } else {
            printf("It is not an equilateral triangle.\n");
        }
    }
}

```

```

    } else {

        printf("The triangle is not valid.\n");

    }

    return 0;

}

```

#### Q10 Eligibility for Admission:

Write a program to check if a student is eligible for admission based on the following criteria:

- Marks in mathematics  $\geq 50$
  - Marks in physics  $\geq 50$
  - Total marks (math + physics)  $\geq 120$
- Use nested **if-else** statements

```

#include<stdio.h>

int main()

{

    int maths,physics,total;

    printf("Enter marks obtained in maths:\n");

    scanf("%d",&maths);

    printf("Enter marks obtained in physics:\n");

    scanf("%d",&physics);

    total=maths+physics;

    if(maths>=50)

    {

        if(physics>=50)

        {

            if(total>=120)

            {

```

```

        printf("Eligible");
    }

    else

        printf("Not eligibe, total less than 120\n");

    }

    else

        printf("Not eligibe, Physics less than 50\n");

    }

    else

        printf("Not eligibe, maths less than 50\n");

    return 0;

}

```

#### Q11 **Switch Case**

Write a program that takes an integer (1-7) as input and uses a switch-case to print the corresponding day of the week (e.g., 1 for Monday, 2 for Tuesday, etc.).

```

#include <stdio.h>

int main() {

    int day;

    char null;

    printf("Enter a number (1-7) to represent a day of the week: ");

    if(scanf("%d%c", &day, &null)==2 && null=="\n")

    {

        switch (day) {

            case 1:

                printf("Monday\n");

```

```
        break;

case 2:

    printf("Tuesday\n");

    break;

case 3:

    printf("Wednesday\n");

    break;

case 4:

    printf("Thursday\n");

    break;

case 5:

    printf("Friday\n");

    break;

case 6:

    printf("Saturday\n");

    break;

case 7:

    printf("Sunday\n");

    break;

default:

    printf("Invalid input! Please enter a number between 1 and 7.\n");

    break;

}

}

else{
```



```

printf("Invalid write an integer");

}

return 0;

}

```

Q12 Write a program to perform basic arithmetic operations (addition, subtraction, multiplication, division) based on the operator input (+, -, \*, /) using a switch-case statement.

```

#include <stdio.h>

int main()
{
    int n1,n2;

    char operator;

    printf("Enter a number: \n");

    scanf("%d",&n1);

    printf("Enter the operator(+,-,/,*)\n");

    scanf(" %c",&operator); //leave a space here to nullify leftover

    printf("Enter a number: \n");

    scanf("%d",&n2);

    switch(operator)
    {

        case '+':

            printf("%d+%d=%d",n1,n2,n1+n2);

            break;

        case '-':

            printf("%d-%d=%d",n1,n2,n1-n2);

            break;

```

```

    case '*':

        printf("%d*%d=%d",n1,n2,n1*n2);

        break;

    case '/':

        printf("%d/%d=%d",n1,n2,n1/n2);

        break;

    default:

        printf("Invalid entry\n");

}

return 0;

}

```

Q13 Write a program that takes a single character as input and uses a switch-case to determine if it is a vowel or a consonant.

```

#include <stdio.h>

int main()

{

    char a;

    printf("Enter letter: \n");

    scanf("%c",&a);

    switch(a)

    {

        case 'a':

            printf("%c is a Vowel\n",a);

            break;

        case 'e':

```

```

    printf("%c is a Vowel\n",a);

    break;

case 'i':

    printf("%c is a Vowel\n",a);

    break;

case 'o':

    printf("%c is a Vowel\n",a);

    break;

case 'u':

    printf("%c is a Vowel\n",a);

    break;

default:

    printf("%c is a Consonant\n",a);

}

return 0;

}

```

Q14 Write a program to convert a single-digit number (0-9) into its word representation (e.g., 1 to "One", 2 to "Two") using a switch-case statement.

```

#include <stdio.h>

int main()

{

    int a;

    char null;

    printf("Enter number: \n");

    if(scanf("%d%c",&a,&null)==2 && null=='\n')

```

```
{  
switch(a)  
{  
    case 0:  
        printf("Zero\n");  
        break;  
    case 1:  
        printf("One\n");  
        break;  
    case 2:  
        printf("Two\n");  
        break;  
    case 3:  
        printf("Three\n");  
        break;  
    case 4:  
        printf("Four\n");  
        break;  
    case 5:  
        printf("One\n");  
        break;  
    case 6:  
        printf("Six\n");  
        break;  
    case 7:
```

```

        printf("Seven\n");

        break;

    case 8:

        printf("Eight\n");

        break;

    case 9:

        printf("Nine\n");

        break;

    default:

        printf("Invalid: not an integer between 0-9\n");

    }

}

else

    printf("Enter an integer\n");


return 0;

}

```

**Q15** Write a program that takes an integer (1-12) as input and uses a switch-case to print the name of the corresponding month (e.g., 1 for January, 2 for February, etc.).

```

#include <stdio.h>

int main()

{

    int month;

    char null;

    printf("Enter month: \n");

```

```
if(scanf("%d%c",&month,&null)==2 && null=="\n")
```

```
{
```

```
switch (month) {
```

```
    case 1:
```

```
        printf("January\n");
```

```
        break;
```

```
    case 2:
```

```
        printf("February\n");
```

```
        break;
```

```
    case 3:
```

```
        printf("March\n");
```

```
        break;
```

```
    case 4:
```

```
        printf("April\n");
```

```
        break;
```

```
    case 5:
```

```
        printf("May\n");
```

```
        break;
```

```
    case 6:
```

```
        printf("June\n");
```

```
        break;
```

```
    case 7:
```

```
        printf("July\n");
```

```
        break;
```

```
    case 8:
```

```
    printf("August\n");

    break;

case 9:

    printf("September\n");

    break;

case 10:

    printf("October\n");

    break;

case 11:

    printf("November\n");

    break;

case 12:

    printf("December\n");

    break;

default:

    printf("Invalid input! Enter a number between 1 and 12.\n");

    break;

}

}

else

    printf("Invalid: Enter an integer\n");

return 0;

}
```

**Q16** Write a program that takes a grade (A, B, C, D, F) as input and uses a switch-case to print the description of the grade (e.g., A: "Excellent", B: "Good", etc.).

```
#include <stdio.h>
```

```
int main() {
```

```
    char grade;
```

```
    printf("Enter a grade (A, B, C, D, F): ");
```

```
    scanf("%c", &grade);
```

```
    switch (grade) {
```

```
        case 'A':
```

```
        case 'a':
```

```
            printf("Excellent\n");
```

```
            break;
```

```
        case 'B':
```

```
        case 'b':
```

```
            printf("Good\n");
```

```
            break;
```

```
        case 'C':
```

```
        case 'c':
```

```
            printf("Average\n");
```

```
            break;
```

```
        case 'D':
```

```
        case 'd':
```

```
            printf("Below Average\n");
```

```
            break;
```

```
        case 'F':
```

```
        case 'f':
```



```

        printf("Fail\n");

        break;

    default:

        printf("Invalid grade! Please enter a grade between A and F.\n");

        break;

    }

    return 0;

}

```

Q17 Write a menu-driven program that offers the user options for basic mathematical operations (addition, subtraction, etc.). Based on the user's choice, perform the corresponding operation using a switch-case.

```

#include <stdio.h>

int main() {

    float n1,n2;

    int choice;

    printf("Enter n1\n");

    scanf("%f",&n1);

    printf("Enter n2\n");

    scanf("%f",&n2);

    printf(" Choose one option \n 1. Addition\n 2. Subtraction\n 3.Multiplication\n 4.Division\n");

    scanf("%d", &choice);

    switch (choice) {

        case 1:

            printf("%.2f+%.2f=%.2f",n1,n2,n1+n2);

            break;

```

```

    case 2:

        printf("%0.2f-%0.2f=%0.2f",n1,n2,n1-n2);

        break;

    case 3:

        printf("%0.2f*%0.2f=%0.2f",n1,n2,n1*n2);

        break;

    case 4:

        printf("%0.2f/%0.2f=%0.2f",n1,n2,n1/n2);

        break;

    default:

        printf("Invalid choice\n");

        break;

}

return 0;

}

```

Q18 Write a program to simulate a traffic light system. Take input as R, Y, or G (Red, Yellow, Green) and use a switch-case to display the corresponding action (e.g., R for Stop, Y for Get Ready, G for Go).

```

#include<stdio.h>

int main(){

    char a;

    printf("Enter Light(R/Y/G)");

    scanf(" %c",&a);

    switch(a){

        case 'R':

```

```

    case 'r':

printf("Stop\n");

break;

    case 'Y':

case 'y':

printf("Get ready\n");

break;

    case 'G':

case 'g':

printf("Go\n");

break;

    default :

printf("Invalid input");

}

return 0;

}

```

Q19 Write a program that takes the year as input and uses a switch-case to check and print whether it is a leap year or not (use logical division by 4 and additional logic in cases).

Use relational operators to determine if a given year is a leap year (divisible by 4 but not by 100 unless divisible by 400).

```

#include<stdio.h>

int main(){

    int year;

    char null;

printf("Enter Year");

if(scanf(" %d%c",&year,&null)==2 && null=='\n')

```

```

{
switch(1){

    case 1:

        if((year%4==0 && year%100!=0) || (year%400==0))

            printf("%d is Leap year\n",year);

        else

            printf("%d is not a Leap year\n",year);

        break;


    default :

        printf("Invalid input");

    }

    return 0;

}

else

    printf("Enter a valid number\n");

}

```

Q20 Write a program to calculate the area of different shapes based on user input:

- 1 for Circle
  - 2 for Rectangle
  - 3 for Triangle
- Use a switch-case to perform the respective area calculations.

```
#include<stdio.h>
```

```
int main(){
```

```
    int choice;
```

```
    char null;
```

```

float area,r,l,b,base,height;

printf("Enter a choice\n 1.Circle\n2.Rectangle\n3.Triangle\n");

if(scanf(" %d%c",&choice,&null)==2 && null=="\n")
{
switch(choice){

    case 1:

        printf("Enter radius of circle");

        scanf("%f",&r);

        area=3.14*r*r;

        printf("Area of circle = %f",area);

        break;

    case 2:

        printf("Enter l and b of rectangle");

        scanf("%f %f",&l,&b);

        area=l*b;

        printf("Area of rectangle = %f",area);

        break;

    case 3:

        printf("Enter base and height of triangle");

        scanf("%f %f",&base,&height);

        area=0.5*base*height;

        printf("Area of triangle = %f",area);

        break;

```

```
    default :  
  
        printf("Invalid input");  
  
        }  
  
        return 0;  
  
    }  
  
    else  
  
        printf("Enter a valid integer\n");  
  
    }
```