1-Equality Check:

Write a program to check if two integers provided by the user are equal or not.

```c
#include <stdio.h>
int main()
{
    int num1 ,num2;
    printf("Enter two Integers:");
    scanf("%d%d",&num1,&num2);
    if(num1==num2)
    {
        printf("The numbers are equal");
    }
    else
    {
        printf("The numbers are not equal");
    }
    return o
}
```

Output:

Enter two Integers:23 44

The numbers are not equal

2- Greater Number Identification:

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

```c
#include <stdio.h>
int main()
{
    int num1,num2;
    printf("Enter two integers:");
    scanf("%d%d",&num1,&num2)
    if(num1>num2)
```

```c
    {
        printf("%d is greater",num1);
    }
    else if(num2>num1)
    {
        printf ("%d is greater",num2)'
    }
    else
    {
        printf("Both the numbers are equal");
    }
    return 0
 }
```

Output:

Enter two integers:46 78

78 is greater

3- Check if a Number is Positive:

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

```c
#include <stdio.h>
 int main()
 {
    int num;
    printf("Enter a number:");
    scanf("%d",&num);
    if (num>0){
        printf("positive");
    }
    else if (num<0){
        printf("Negative");
    }
    else{
```

```
    printf("zero");

    }

    return 0;

 }
```

Output:

Enter a number:12

positive

4-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 and breadth of a rectangle:");

    scanf("%f%f",&length,&breadth);

    if(length>0 && breadth>0){

       printf("Valid");

    }

    else{

       printf("Not Valid");

    }

    return 0;

  }
```

Output:

Enter the length and breadth of a rectangle:34 56

Valid

5-Grade Eligibility Check:

Given a student's marks in a subject, determine if the student has passed (marks >= 40).

```
#include <stdio.h>

 int main()
```

```c
{
    float marks;
    printf("Enter the Marks:");
    scanf("%f",&marks);
    if (marks>=40){
        printf("Student has passed");
    }
    else{
        printf("student has not passed");
    }
    return 0;
}
```

Output:

Enter the Marks:34

student has not passed

6-Check if Number is Within Range:

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

```c
#include <stdio.h>
int main() {
    int num;
    printf("Enter a number: ");
    scanf("%d", &num);
    if (num >= 10 && num <= 50) {
        printf("The number is within the range.\n");
    } else {
        printf("The number is out of the range.\n");
    }
    return 0;
}
```

Output:

Enter a number: 67

The number is out of the range.

7-Verify Alphabetic Range:

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

```c
#include <stdio.h>

int main() {
  char ch;
  printf("Enter a character: ");
  scanf("%c", &ch);
  if (ch >= 'a' && ch <= 'z') {
     printf("The character is a lowercase letter.\n");
  } else {
     printf("The character is not a lowercase letter.\n");
  }
return 0;
}
```

Output:

Enter a character: h

The character is a lowercase letter.

8-Age Comparison:

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

```c
#include <stdio.h>

int main() {
  int age1, age2;
  printf("Enter the age of first person: ");
  scanf("%d", &age1);
  printf("Enter the age of second person: ");
  scanf("%d", &age2);
```

```c
    if (age1 > age2) {

        printf("The first person is older.\n");

    } else if (age2 > age1) {

        printf("The second person is older.\n");

    } else {

        printf("Both persons are of the same age.\n");

    }

    return 0;

}
```

Output:

Enter the age of first person: 56

Enter the age of second person: 90

The second person is older.

9-Weight Limit Check:

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

```c
#include <stdio.h>

 int main() {

   float weight;

   printf("Enter the weight of the object (in kg): ");

   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;

 }
```

Output:

Enter the weight of the object (in kg): 45

The weight is within the limit.

10-Rectangle Larger Area Check:

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

```c
#include <stdio.h>

int main() {
   float length1, breadth1, length2, breadth2, area1, area2;


   printf("Enter the length and breadth of first rectangle: ");
   scanf("%f %f", &length1, &breadth1);
   printf("Enter the length and breadth of second rectangle: ");
   scanf("%f %f", &length2, &breadth2);
   area1 = length1 * breadth1;
   area2 = length2 * breadth2;
   if (area1 > area2) {
      printf("The first rectangle has a larger area.\n");
   } else if (area2 > area1) {
      printf("The second rectangle has a larger area.\n");
   } else {
      printf("Both rectangles have the same area.\n");
   }
   return 0;
}
```

Output:

Enter the length and breadth of first rectangle: 45 56

Enter the length and breadth of second rectangle: 87 23

The first rectangle has a larger area.

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

```c
#include <stdio.h>
int main() {
    int num1, num2;
    printf("Enter first number: ");
    scanf("%d", &num1);
    printf("Enter second number: ");
    scanf("%d", &num2);
    int result = num1 & num2;
    printf("Result of bitwise AND operation: %d\n", result);
    return 0;
}
```

Output:

Enter first number: 24

Enter second number: 45

Result of bitwise AND operation: 8

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

```c
#include <stdio.h>
int main() {
    int num1, num2;
    printf("Enter first number: ");
    scanf("%d", &num1);
    printf("Enter second number: ");
    scanf("%d", &num2);
    int result = num1 | num2;
    printf("Result of bitwise OR operation: %d\n", result);
    return 0;
}
```

Output:

Enter first number: 45

Enter second number: 78

Result of bitwise OR operation: 111

3-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 num1, num2;

   printf("Enter first number: ");

   scanf("%d", &num1);

   printf("Enter second number: ");

   scanf("%d", &num2);

   int result = num1 ^ num2;

   printf("Result of bitwise XOR operation: %d\n", result);

   return 0;

}

Output:

Enter first number: 20

Enter second number: 34

Result of bitwise XOR operation: 54

4-Write a program to find the bitwise complement of a given integer and print the result.

#include <stdio.h>

int main() {

   int num;

   printf("Enter a number: ");

   scanf("%d", &num);

   int result = ~num;

   printf("Bitwise complement of %d: %d\n", num, result);

   return 0;

}

Output:

Enter a number: 20

Bitwise complement of 20: -21

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

```c
#include <stdio.h>

int main() {
    int num, pos;
    printf("Enter a number: ");
    scanf("%d", &num);
    printf("Enter the position to toggle: ");
    scanf("%d", &pos);
    int mask = 2 << pos;
    int result = num ^ mask;
    printf("Result after toggling bit at position %d: %d\n", pos, result);
    return 0;
}
```

Output:

Enter a number: 23

Enter the position to toggle: 2

Result after toggling bit at position 2: 31

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

```c
#include <stdio.h>

int main() {
    int num, pos;
    printf("Enter a number: ");
    scanf("%d", &num);
    printf("Enter the position to set: ");
    scanf("%d", &pos);
    int mask = 1 << pos;
    int result = num | mask;
```

```
    printf("Result after setting bit at position %d: %d\n", pos, result);

    return 0;
}
```

Output:

Enter a number: 45

Enter the position to set: 4

Result after setting bit at position 4: 61

7-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 num, pos;
  printf("Enter a number: ");
  scanf("%d", &num);
  printf("Enter the position to clear: ");
  scanf("%d", &pos);
  int mask = ~(1 << pos);
  int result = num & mask;
  printf("Result after clearing bit at position %d: %d\n", pos, result);
    return 0;
}
```

Output:

Enter a number: 12

Enter the position to clear: 2

Result after clearing bit at position 2: 8

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).

```c
#include <stdio.h>

int main() {

int num;

printf("Enter an integer: ");

scanf("%d", &num);

if (num % 5 == 0 && num>50) {

    printf("%d is a multiple of 5,greater than 50.\n", num);

} else {

    printf("%d is not a multiple of 5,not greater than 50.\n", num);

}

if (num & 0) {

    printf("The least significant bit of %d is set.\n", num);

} else {

    printf("The least significant bit of %d is not set.\n", num);

}

    return 0;

}
```

Output:

Enter an integer: 23

23 is not a multiple of 5,not greater than 50.

The least significant bit of 23 is not set.

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>

```c
int main() {
  int n, p;
  printf("Enter an integer: ");
  scanf("%d", &n);
  printf("Enter the bit position to toggle: ");
  scanf("%d", &p);
  n ^= (1 << p);
  printf("Number after toggling bit at position %d: %d\n", p, n);
  if (n > 0 && n % 2 == 0) {
    printf("The updated number is positive and divisible by 2.\n");
  }
  else {
    printf("The updated number is either not positive or not divisible by 2.\n");
  }
  return 0;
}
```

Output:

Enter an integer: 45

Enter the bit position to toggle: 4

Number after toggling bit at position 4: 61

The updated number is either not positive or not divisible by 2.

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).

```c
#include <stdio.h>


int main() {
```

```c
    int age, id;

    printf("Enter age: ");

    scanf("%d", &age);

    printf("Enter ID number: ");

    scanf("%d", &id);

    if (age >= 18) {

        if (id & (1 << 3)) {

            printf("You are eligible to vote.\n");

        } else {

            printf("You are not a registered citizen.\n");

        }

    } else {

        printf("You are not eligible to vote due to age.\n");

    }

    return 0;

}
```

Output:

Enter age: 25

Enter ID number: 34

You are not a registered citizen.

4-Write a program to verify these conditions using logical operators.

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).

```c
#include <stdio.h>

int main() {

    int num, set_pos, clear_pos;
```

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

    scanf("%d", &num);

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

    scanf("%d", &set_pos);

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

    scanf("%d", &clear_pos);

    num |= (1 << set_pos);

    num &= ~(1 << clear_pos);

    printf("Number after setting bit at position %d and clearing bit at position %d: %d\n", set_pos,
clear_pos, num);

    if (num % 2 != 0 && num >= 10 && num <= 100) {

        printf("The resulting number is odd and within the range [10, 100].\n");

    } else {

        printf("The resulting number is either not odd or not within the range [10, 100].\n");

    }

    return 0;

}
```

Output:

Enter an integer: 27

Enter bit position to set: 3

Enter bit position to clear: 5

Number after setting bit at position 3 and clearing bit at position 5: 27

The resulting number is odd and within the range [10, 100].

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>

```c
int main() {
int num, pos;
printf("Enter a number: ");
scanf("%d", &num);
printf("Enter the position to toggle: ");
scanf("%d", &pos);
int mask = 1 << pos;
int result = num ^ mask;
printf("Result after toggling bit at position %d: %d\n", pos, result);
return 0;
}
```

Output:

Enter a number: 34

Enter the position to toggle: 5

Result after toggling bit at position 5: 2

If Statements

1-Check for Positivity:

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

```c
#include <stdio.h>
 int main()
 {
    int num;
    printf("Enter the number:");
    scanf("%d",&num);
    if (num>0){
        printf("Positive");
    }
    return 0;
 }
```

Output:

Enter the number:67

Positive

2-Divisibility Check:

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

```c
#include <stdio.h>
 int main()
 {
    int num;
    printf("Enter the num:");
    scanf("%d",&num);
    if (num%3==0){
        printf("It is divisible by 3");
    }
    return 0;
 }
```

Output:

Enter the num:45

It is divisible by 3

If-Else Statements:

3-Odd or Even:

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

```c
#include <stdio.h>
int main()
{
    int num;
    printf("Enter the num:");
    scanf("%d",&num);
    if (num %2 ==0){
        printf("It is even");
    }
    else{
        printf("It is odd");
    }
}
```

Output:

Enter the num:12

It is even

4-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."

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

```c
    printf("Enter the marks:");

    scanf("%f",&marks);

    if (marks >=40){

      printf("The student is passed");

    }

    else{

        printf("The student is fail");

    }

    return 0;

 }
```

Output:

Enter the marks:80

The student is passed

Nested If-Else Statements

 5-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.

```c
#include <stdio.h>

 int main()

 {

    int a,b,c;

    printf("Enter the length of all three sides a,b,c:");

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

    if(a+b>c && b+c>a && a+c>b){

      if(a==b && b==c){

        printf("The triangle is equilateral triangle");

      }

      else{

        printf("The triangle is not a equilateral triangle");

      }
```

```
    }
    else{
        printf("The triangle is not valid");
    }
    return 0;
}
```

Output:

Enter the length of all three sides a,b,c:23 34 45

The triangle is not a equilateral triangle

Eligibility for Admission:

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

Marks in mathematics >= 50

Marks in physics >= 50

Total marks (math + physics) >= 120

Use nested if-else statements.

```
#include <stdio.h>
int main(){
    int math,phy,total;
    printf("Enter the marks in Maths:");
    scanf("%d",&math);
    printf("Enter the marks in Physics:");
    scanf("%d",&phy);
    total = math + phy;
    if (math>=50){
        if(phy>=50){
            if(total>=120){
                printf("The student is eligible for admission");
            }
            else{
                printf("Total mark is less than 120,it is not eligible ");
```

```c
            }
        }
        else{
            printf("Physics mark is less than 50,it is not eligible ");
        }
    }
    else{
        printf("Maths mark is less than 50,it is not eligible ");
    }
        return 0;
}
```

Output:

Enter the marks in Maths:78

Enter the marks in Physics:34

Physics mark is less than 50,it is not eligible

If-Else-If Ladder

7-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

```c
#include <stdio.h>
 int main() {
 int percentage;
 printf("Enter the student's percentage: ");
 scanf("%d", &percentage);
 if (percentage >= 90) {
    printf("Grade A\n");
```

```c
    }
    else if (percentage >= 75) {
        printf("Grade B\n");
    }
    else if (percentage >= 50) {
        printf("Grade C\n");
    }
    else {
        printf("Fail\n");
    }
    return 0;
}
```

Output:

Enter the student's percentage: 70

Grade C

8-Number Classification:

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

```c
#include <stdio.h>
int main() {
int num;
printf("Enter a number: ");
scanf("%d", &num);
if (num > 0) {
    printf("The number is positive.\n");
}
else if (num < 0) {
    printf("The number is negative.\n");
}
else {
    printf("The number is zero.\n");
```

```
    }
    return 0;
}
```

Output:

Enter a number: 78

The number is positive.

Enter a number: -90

The number is negative.

9-Electricity Bill Calculation:

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

Units <= 100: ₹5 per unit

Units > 100 and <= 200: ₹7 per unit

Units > 200: ₹10 per unit

Use an if-else-if ladder to implement this.


```c
#include <stdio.h>
 int main() {
   int units;
   printf("Enter the number of units consumed: ");
   scanf("%d", &units);
   float bill;
   if (units <= 100) {
      bill = units * 5;
   } else if (units > 100 && units <= 200) {
      bill = units * 7;
   } else {
      bill = units * 10;
   }
   printf("The electricity bill is: ₹%.2f\n", bill);
```

```c
    return 0;
}
```

Output:

Enter the number of units consumed: 78

The electricity bill is: ₹390.00

10-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.

```c
#include <stdio.h>
 int main() {
   int day;
   printf("Enter the number: ");
   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 day number!\n");
   }
```

```
    return 0;

}
```

Output:

Enter the number: 7

Sunday

Enter the number: 0

Invalid day number!

Switch Case

1-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.).

```c
#include <stdio.h>
int main() {
    int day;
    printf("Enter a number (1-7): ");
    scanf("%d", &day);
    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 day number!\n");
    }
    return 0;
}
```

Output:

Enter a number (1-7): 5

Friday

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

```c
#include <stdio.h>
int main() {
    char operator;
    float num1, num2;
    printf("Enter an operator (+, -, *, /): ");
    scanf("%c", &operator);
    printf("Enter two numbers: ");
    scanf("%f %f", &num1, &num2);
    switch(operator) {
        case '+': printf("Result: %.2f\n", num1 + num2); break;
        case '-': printf("Result: %.2f\n", num1 - num2); break;
        case '*': printf("Result: %.2f\n", num1 * num2); break;
        case '/':
            if (num2 != 0)
                printf("Result: %.2f\n", num1 / num2);
            else
                printf("Error! Division by zero.\n");
            break;
        default: printf("Invalid operator!\n");
    }
    return 0;
}
```

Output:

Enter an operator (+, -, *, /): -

Enter two numbers: 23 45

Result: -22.00

3-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>

```c
int main() {

    char ch;

    printf("Enter a character: ");

    scanf("%c", &ch);

    switch(ch) {

        case 'a': case 'A':

        case 'e': case 'E':

        case 'i': case 'I':

        case 'o': case 'O':

        case 'u': case 'U':

         printf("Vowel\n");

            break;

        default:

            printf("Consonant\n");

    }

    return 0;

}
```

Output:

Enter a character: g

Consonant

Enter a character: i

Vowel

4-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.

```c
#include <stdio.h>

int main() {

    int num;

    printf("Enter a single digit number (0-9): ");

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

```c
    switch(num) {

        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("Five\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 input!\n");

    }

    return 0;

}
```

Output:

Enter a single digit number (0-9): 3

Three

5-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.).

```c
#include <stdio.h>

int main() {

    int month;

    printf("Enter a month number (1-12): ");

    scanf("%d", &month);

    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;
```

```c
        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 month number!\n");

    }

    return 0;

}
```

Output:

Enter a month number (1-12): 8

August

Enter a month number (1-12): -9

Invalid month number!

6-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.).

```c
#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("Poor\n"); break;

        case 'F': case 'f': printf("Fail\n"); break;
```

```
    default: printf("Invalid grade!\n");

  }

  return 0;

}
```

Output:

Enter a grade (A, B, C, D, F): c

Average

7-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() {

  int choice;

  float num1, num2;

  printf("Menu:\n");

  printf("1. Addition\n2. Subtraction\n3. Multiplication\n4. Division\n");

  printf("Enter your choice (1-4): ");

  scanf("%d", &choice);

  printf("Enter two numbers: ");

  scanf("%f %f", &num1, &num2);

  switch(choice) {

    case 1: printf("Result: %.2f\n", num1 + num2); break;

    case 2: printf("Result: %.2f\n", num1 - num2); break;

    case 3: printf("Result: %.2f\n", num1 * num2); break;

    case 4:

      if (num2 != 0)

        printf("Result: %.2f\n", num1 / num2);

      else

        printf("Error! Division by zero.\n");

      break;

    default: printf("Invalid choice!\n");
```

```
    }
    return 0;
}
```

Output:

Menu:

1. Addition

2. Subtraction

3. Multiplication

4. Division

Enter your choice (1-4): 3

Enter two numbers: 23 45

Result: 1035.00

8-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).

```c
#include <stdio.h>
int main() {
    char light;
    printf("Enter traffic light color (R, Y, G): ");
    scanf("%c", &light);
    switch(light) {
        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! Please enter R, Y, or G.\n");
    }
    return 0;
}
```

Output:

Enter traffic light color (R, Y, G): r

Stop

9-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).

```c
#include <stdio.h>

int main() {

    int year;

    printf("Enter a year: ");

    scanf("%d", &year);

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

        case 1: printf("%d is a leap year.\n", year); break;

        default: printf("%d is not a leap year.\n", year);

    }

    return 0;

}
```

Output:

Enter a year: 2034

2034 is not a leap year.

10-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.


```c
#include <stdio.h>

#include <math.h>

int main() {

    int choice;

    printf("Choose the shape:\n");

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

    printf("Enter your choice (1-3): ");

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

```c
    switch(choice) {
        case 1: {
            float radius;
            printf("Enter the radius of the circle: ");
            scanf("%f", &radius);
            printf("Area of the circle: %.2f\n", M_PI * radius * radius);
            break;
        }
        case 2: {
            float length, breadth;
            printf("Enter the length and breadth of the rectangle: ");
            scanf("%f %f", &length, &breadth);
            printf("Area of the rectangle: %.2f\n", length * breadth);
            break;
        }
        case 3: {
            float base, height;
            printf("Enter the base and height of the triangle: ");
            scanf("%f %f", &base, &height);
            printf("Area of the triangle: %.2f\n", 0.5 * base * height);
            break;
        }
        default: printf("Invalid choice!\n");
    }
    return 0;
}
```

Output:

Choose the shape:

1. Circle

2. Rectangle

3. Triangle

Enter your choice (1-3): 2

Enter the length and breadth of the rectangle: 23 34

Area of the rectangle: 782.00

Choose the shape:

1. Circle

2. Rectangle

3. Triangle

Enter your choice (1-3): 3

Enter the base and height of the triangle: 23 41

Area of the triangle: 471.50