1. Write a program to perform addition, subtraction, multiplication, division, and modulus operations on two user-provided integers.

```
#include <stdio.h>


int main()
{
  int a,b;
  printf("enter first variables");
  scanf("%d",&a);
  printf("enter secnd variable");
  scanf("%d",&b);
  printf("addition of the nmbers is %d\n",a+b);
  printf("subtraction of the nmbers is %d\n",a-b);
  printf("multiplicationn of the nmbers is %d\n",a*b);
  printf("division of the nmbers is %d\n",a/b);
  printf("modulus of the nmbers is %d\n",a%b);
  return 0;
}
```

2. Write a program to calculate the average of five integers provided by the user.

```
#include <stdio.h>

int main()
{
  int n1,n2,n3,n4,n5, avg;
  printf("enter five numbers:");
  scanf("%d %d %d %d %d",&n1, &n2, &n3 ,&n4, &n5);
  avg = (n1+n2+n3+n4+n5)/5;
  printf("avg of the given nmber = %d",avg);


  return 0;
}
```

3. Compute and display the area and perimeter of a rectangle given its length and width

```
#include <stdio.h>

int main()
{

  int l=5,b=3;
 printf("area of the rectangle=%d\n",l*b);
 printf("perimeter of the rectangle =%d\n",2*(l+b));
  return 0;
}
```

4. Write a program to calculate the compound interest using the formula:

A=P×(1+(r/100))^n

where P is the principal, r is the rate of interest, and n is the time period.

5. Write a program to convert a temperature from Celsius to Fahrenheit using the formula:

F=(9/5)*C+32

```
#include <stdio.h>

int main()
{

 int temp , f;
```

```
 printf("enter the temperature in celcius:");
 scanf("%d",&temp);
 f=(9/5)*temp+32;
 printf("the temperature in fareinheat=%d",f);
  return 0;
}
```

6. Write a program to swap the values of two variables without using a third variable, relying only on arithmetic operations.

```
#include <stdio.h>

int main()
{

 int a,b;
 printf("enter the first value a:");
 scanf("%d",&a);
 printf("enter the second value b:");
 scanf("%d",&b);
 a=a+b;
 b=a-b;
 a=a-b;
 printf("the swapped values a= %d, b=%d",a,b);
  return 0;
}
```

7. Write a program to find the sum of the digits of a given three-digit number.

```
#include <stdio.h>

int main()
{
  int n,sum=0;
 printf("enter a threedigit number");
 scanf("%d",&n);
 sum=sum+(n%10);
 n=n%10;
 sum= sum+(n%10);
 n=n%10;
 sum=sum+(n%10);
 printf("sum of the digits = %d ",sum);
  return 0;
}
```

8. Calculate the hypotenuse of a right triangle given the lengths of the other two sides using the formula:

C = root over of (a^2 + b^2)

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

int main()
{
 double base,alt,C;
 printf("enter the base of the triangle:");
 scanf("%lf",&base);
  printf("enter the altitude of the triangle:");
```

```
 scanf("%lf",&alt);
 C = sqrt (base*base + alt*alt);
 printf("the hypotnuse of the triangle is %lf",C);
  return 0;
}
```

9. Write a program to calculate the circumference and area of a circle given its radius. Use the formulas:

- Area: πr^2
- Circumference: 2πr

```
#include <stdio.h>
#define PI 3.14

int main()
{
 double r,area ,c;
 printf("enter the radius of the circle:");
 scanf("%lf",&r);
 area = PI*(r*r);
 c = 2*PI*r;
 printf("area of the circle=%lf\n",area);
 printf("circumference of the given circle=%lf",c);

  return 0;
}
```

10. Write a program to calculate the profit or loss made on a transaction given the cost price and selling price of an item.

```
#include <stdio.h>

int main() {
    float costPrice, sellingPrice, profit, loss;
   printf("Enter the Cost Price: ");
    scanf("%f", &costPrice);
    printf("Enter the Selling Price: ");
    scanf("%f", &sellingPrice);

    if (sellingPrice > costPrice)
    {
  profit = sellingPrice - costPrice;
  printf("Profit: %.2f\n", profit);
    }
    else if (costPrice > sellingPrice)
    {
  loss = costPrice - sellingPrice;
   printf("Loss: %.2f\n", loss);
    }
    else {
      printf("No Profit, No Loss\n");
    }

    return 0;
}
```

Compare Two Numbers:
Write a program to check if two integers are equal, not equal, greater than, or less than each other using relational operators.

```
#include <stdio.h>


int main()

{

 int n1,n2;

 printf("enter two numbers");

 scanf("%d %d",&n1,&n2);

 if(n1==n2)

 {

    printf("thenumbers are equal");

 }

    else{

       if(n1>n2)

       {

          printf("%d is greater",n1);

       }

       else

          printf("%d is greater",n2);

    }

    return 0;


}
```

Eligibility for Voting:
Determine whether a person is eligible to vote based on their age (age must be greater than or equal to 18).

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

```
int main()
{
 int age;
 printf("enter your age");
 scanf("%d",&age);
 if(age>=18)
 {
    printf("you are eligible for voting");

 }
 else{
    printf("you are not eligible for voting");
 }
    return 0;

}
```

Triangle Validity Check:
Given three sides of a triangle, use relational operators to check if the triangle is valid (the sum of any two sides must be greater than the third side).

```
#include <stdio.h>

int main()
{
 int s1,s2,s3;
 printf("enter the 3 sides of a triangle");
 scanf("%d %d %d",&s1,&s2,&s3);
 if(s1+s2>s3 && s2+s3>s1&&s1+s3>s2)
 {
    printf("the triangle is valid");
 }
```

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

}
```

Student Grade Comparison:
Compare the marks of two students to determine who scored higher, or if they have the same marks.

```
#include <stdio.h>

int main()
{
 int mark1,mark2;
  printf("enter the mark of first student");
  scanf("%d",&mark1);
  printf("enter the mark of second student");
  scanf("%d",&mark2);
  if(mark1==mark2)
  {
     printf("the marks are equal");
  }
  else{
     if(mark1>mark2){
        printf("first student has more mark");
     }
     else{
        printf("second student has more mark");
     }
  }
```

```
    return 0;

}
```

Find the Largest of Three Numbers:
Write a program to compare three numbers and determine the largest number using relational operators.

```
#include <stdio.h>

int main() {
   int num1, num2, num3;
   printf("Enter three numbers: ");
   scanf("%d %d %d", &num1, &num2, &num3);
   if (num1 >= num2 && num1 >= num3) {
      printf("%d is the largest number.\n", num1);
   } else if (num2 >= num1 && num2 >= num3) {
      printf("%d is the largest number.\n", num2);
   } else {
      printf("%d is the largest number.\n", num3);
   }

   return 0;
}
```

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;
```

```
   printf("Enter a year: ");
   scanf("%d", &year);
   if ((year % 4 == 0 && year % 100 != 0) || (year % 400 == 0))
   {
      printf("%d is a leap year.\n", year);
      }
      else
      {
         printf("%d is not a leap year.\n", year);
         }
         return 0;
         }
```

Write a program to check if the temperature exceeds a threshold value (e.g., greater than 40 degrees Celsius) and display an alert message.

```
#include <stdio.h>
int main()
{
   float temp;
   float threshold=40;
   printf("enter the temperatuer in celsius");
   scanf("%f",&temp);
   if(temp>threshold)
   {
      printf("the temperature is high");

   }
   else{
   printf("the temeperature is normal");
}
```

```
    return 0;
    }
```

Given the length of a password, check if it meets the minimum requirement of 8 characters using relational operators.

```
#include <stdio.h>
#include<string.h>
int main()
{
   char password[20];
   printf("enter your password");
   scanf("%s",&password);
   if(strlen(password) >= 8)
   {
      printf(" Password meets the minimum requirement");
   }else
   {
      printf("Password doesnot meet the minimum requirement");
   }
   return 0;
}
```

Write a program to determine if one number is divisible by another using relational operators.

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

   int num1,num2;
   printf("enter two numbers:");
   scanf("%d %d",&num1,&num2);
```

```
    if(num2==0)
    {
        printf("not valid");
    }
    else {
    if(num1%num2==0)
    {
        printf("%d is divisible by %d",num1,num2);
    }
    else{
        printf("%d is not divisible by %d",num1,num2);
    }
    }
    return 0;
}
```

Check if a student meets the criteria for admission to a course based on their age (greater than or equal to 18) and marks (greater than or equal to 50).

```
#include <stdio.h>
int main()
{
    int age,mark;
    printf("enter the age of the student");
    scanf("%d",&age);
    printf("enter the mark of student");
    scanf("%d",&mark);
    if(age>=18 && mark >= 50)
    {
        printf("student meets the criteria for admission");
    }
```

```
    else{
        printf("student doesnt meet the criteria for admission");
    }
}
```