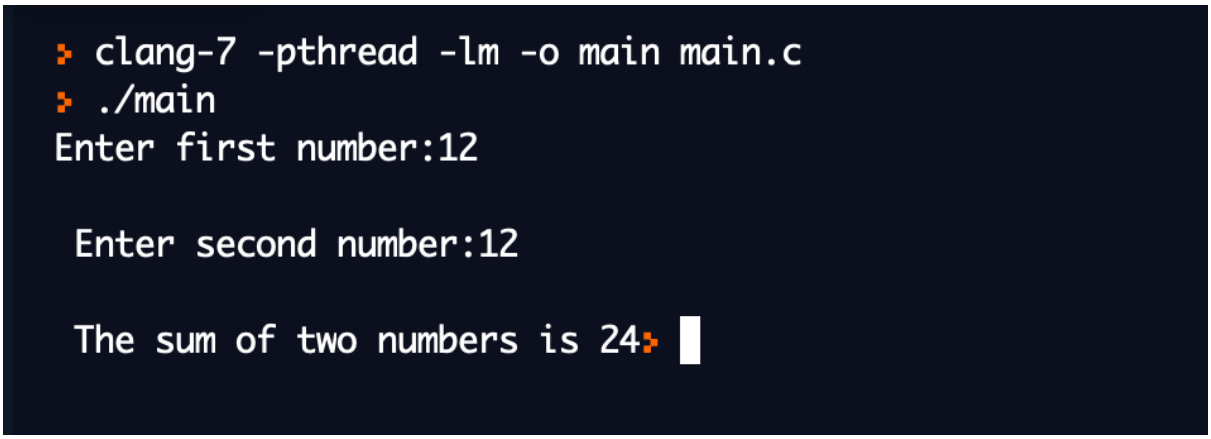
Q1. (a) Write a C program to add two numbers.
(b) Write a C program to add three numbers.

(a)

```
#include <stdio.h>

int main()

{

   int n1; int n2; int sum;

   printf("Enter first number:");

   scanf("%d", &n1);

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

   scanf("%d", &n2);

   sum = n1+n2;

   printf("\n The sum of two numbers is %d",sum);


}
```

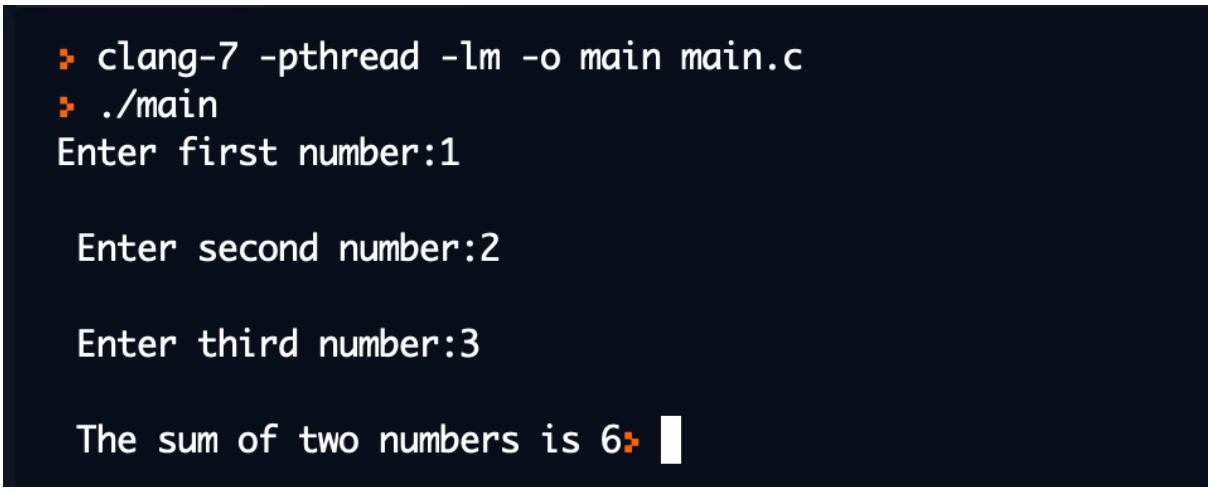
OUTPUT:



(b)

```
#include <stdio.h>
int main()
{
   int n1,n2,n3; int sum;
   printf("Enter first number: ");
   scanf("%d", &n1);
   printf("\n Enter second number: ");
   scanf("%d", &n2);
   printf("\n Enter third number: ");
   scanf("%d", &n3);
   sum = n1+n2+n3;
   printf("\n The sum of two numbers is %d",sum);

}
```

OUTPUT:

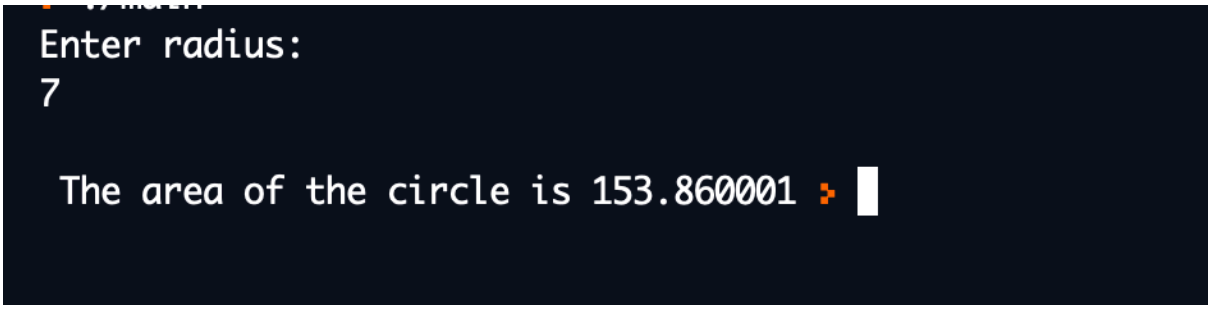


Q2. (a) Write a C program to find area of circle
(b) Write a C program to calculate simple interest

(a)

```
#include <stdio.h>


main()
{
   float r; float ar;
   printf("Enter radius:\n");
   scanf("%f", &r);
   ar = 3.14*r*r;
   printf("\n The area of the circle is %f ", ar);



}
```

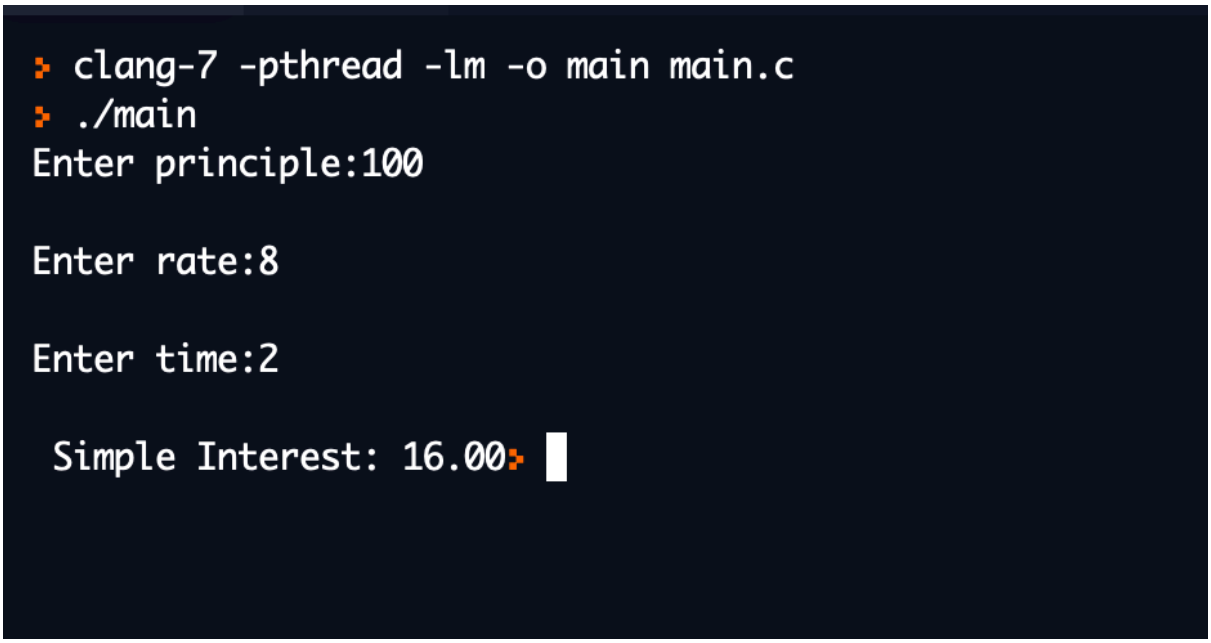
OUTPUT:



(b)

```
#include <stdio.h>
int main()
{
   float p,r,t;
   printf("Enter principle:");
   scanf("%f", &p);
   printf("\nEnter rate:");
   scanf("%f", &r);
   printf("\nEnter time:");
   scanf("%f", &t);
   printf("\n Simple Interest: %.2f",p*r*t/100.0);

}
```

OUTPUT:



Q3. Write a C program to print a block F using hash (#), where the F has a height of six characters and width of five and four characters.

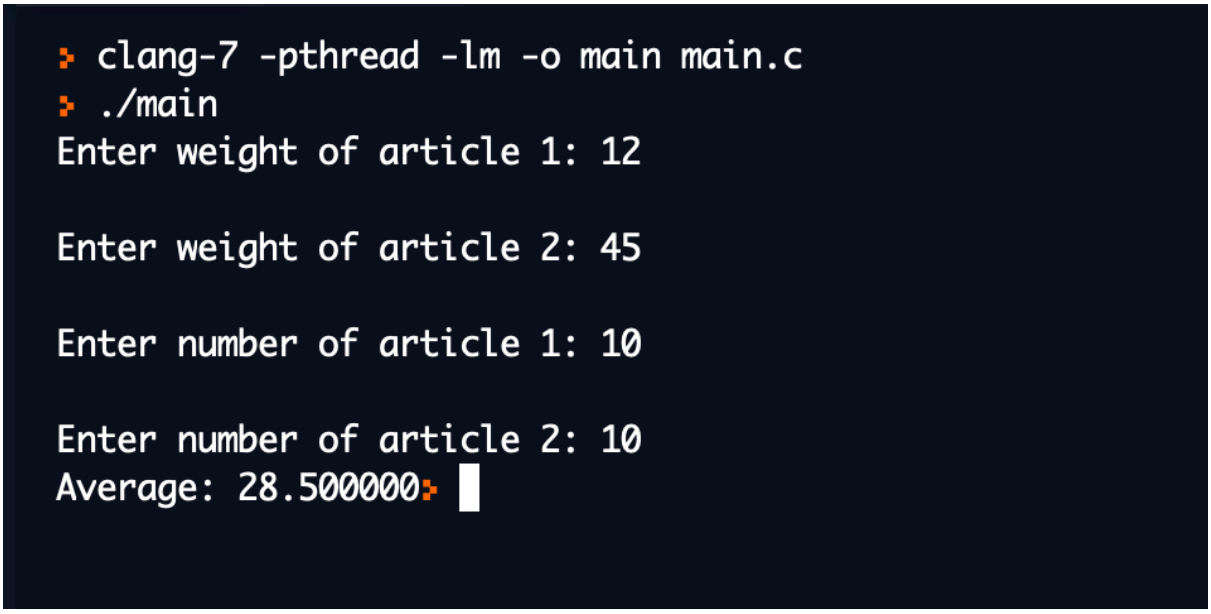
```
#include <stdio.h>


int main()

{

   printf("######\n#\n#####\n#\n#\n#\n  ");


   return 0;

}
```

OUTPUT:

Q4. Write a C program that accepts two item’s weight (floating points' values) and number of purchase (floating points' values) and calculate the average value of the items.

```
#include <stdio.h>

int main()
{
   float a,b;
 int n1,n2;
   printf("Enter weight of article 1: ");
   scanf("%f", &a);
   printf("\nEnter weight of article 2: ");
   scanf("%f", &b);
   printf("\nEnter number of article 1: ");
   scanf("%d", &n1);
   printf("\nEnter number of article 2: ");
   scanf("%d", &n2);
   printf("Average: %f",((a*n1)+(b*n2))/(n1+n2));
}
```

OUTPUT:

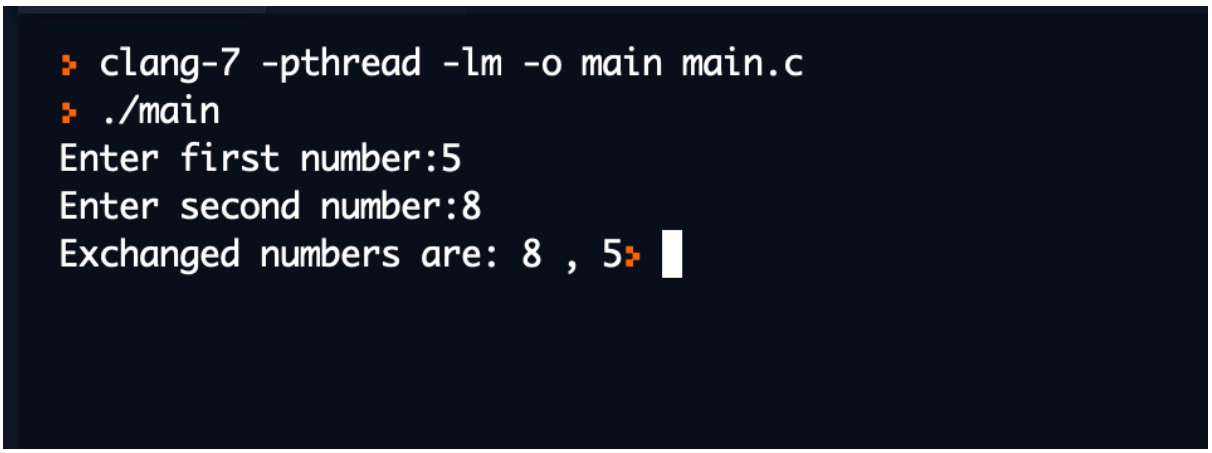


Q5. (a) Write a C program to swap two variables using a third variable.
(b) Write a C program to swap two variables without using a third variable.

(a)

```
#include <stdio.h>


int main()
{
   int a;int b;int t;
   printf("Enter first number:");
   scanf("%d",&a);
   printf("Enter second number:");
   scanf("%d",&b);
   t = a;
   a = b;
   b = t;
   printf("Exchanged numbers are: %d , %d",a,b);
   return 0;
}
```

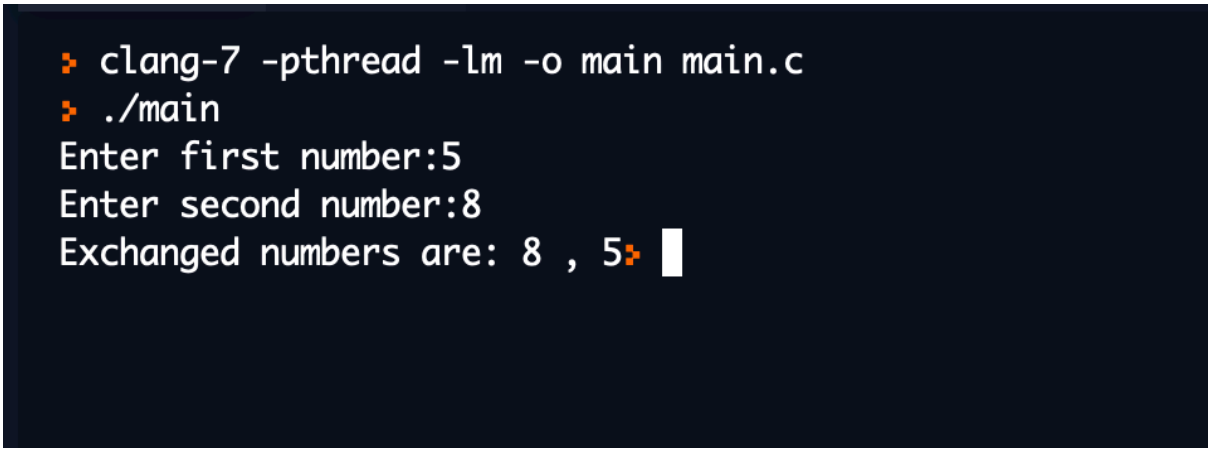
OUTPUT:



(b)

```
#include <stdio.h>


int main()
{
   int a;int b;int t;
   printf("Enter first number:")
   scanf("%d",&a);
   printf("Enter second number:")
   scanf("%d",&b);
a= a+b;
b=a-b;
a=a-b;
   printf("Exchanged numbers are: %d , %d",a,b);
   return 0;
}
```

OUTPUT:

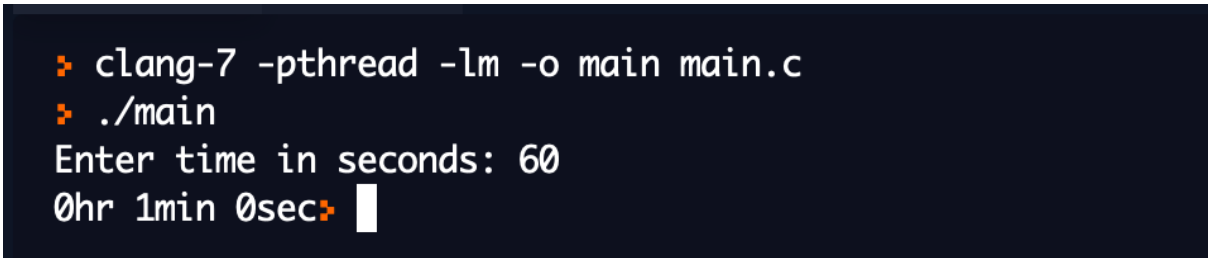


Q6. (a) Write a C program to convert a given integer (in seconds) to hours and minutes.
(b) Write a C program to convert specified days into years, weeks, and days.
Note: Ignore leap year. Test Data: Number of days: 1329-3 years,33 weeks and 3 days
(c) Write a C program to check whether a number is even or odd.

(a)

```
#include <stdio.h>
int main()
{
   int t,h,m,s;
   printf("Enter time in seconds: ");
   scanf("%d", &t);
   h=(int)(t/3600.0);
   m=(t%3600)/60;
   s=(t%3600)%60;
   printf("%dhr %dmin %dsec",h,m,s);
}
```

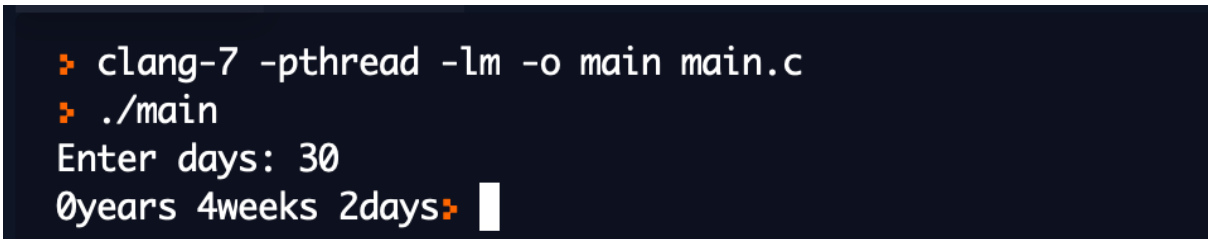
OUTPUT:



(b)

```
#include <stdio.h>
int main()
{
   int t,y,m,d;
   printf("Enter days: ");
   scanf("%d", &t);
   y=(int)(t/365);
   m=(t%365)/7;
   d=(t%365)%7;
   printf("%dyears %dweeks %ddays",y,m,d);
}
```

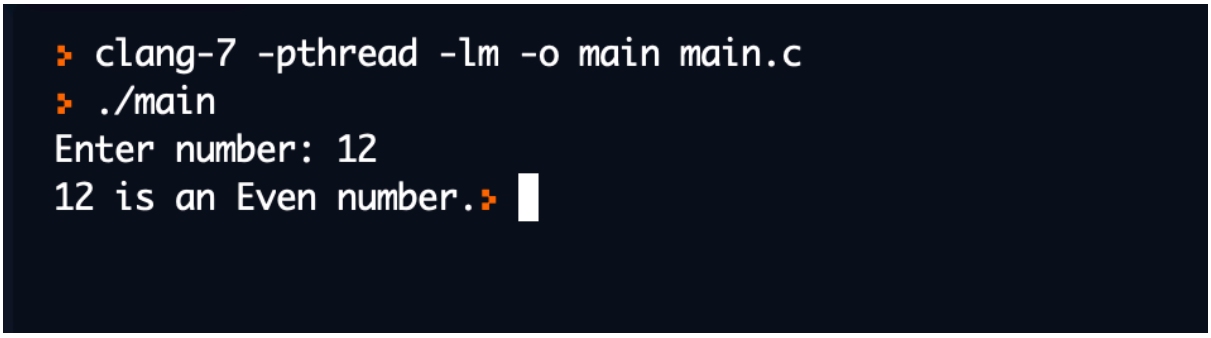
OUTPUT:



(c)

```
#include <stdio.h>
int main()
{
   int n;
   printf("Enter number: ");
   scanf("%d", &n);
   if(n%2==0)
    printf("%d is an Even number.",n);
   else
    printf("%d is an Odd number.",n);
}
```

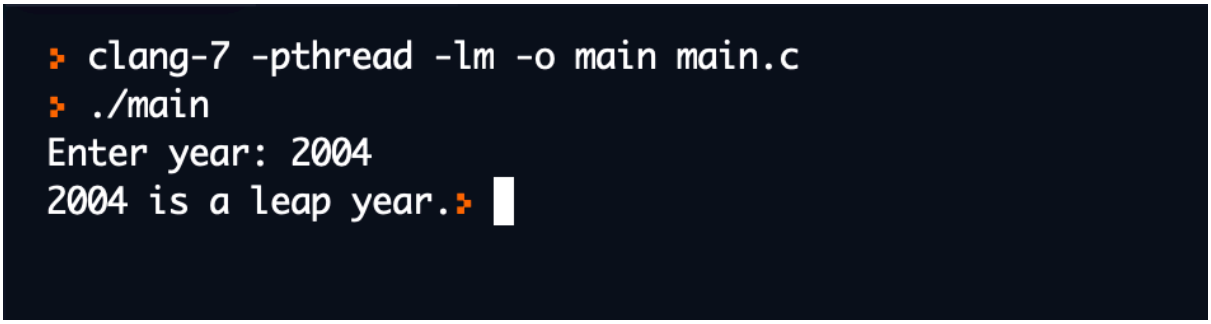
OUTPUT:



Q7. Write a C program to check whether a given year is Leap year or not.

```
#include <stdio.h>
int main()
{
   int y;
   printf("Enter year: ");
   scanf("%d", &y);
   if (y % 400 == 0)
     printf("%d is a leap year.", y);
   else if (y % 100 == 0)
     printf("%d is not a leap year.", y);
   else if (y % 4 == 0)
     printf("%d is a leap year.", y);
   else
     printf("%d is not a leap year.", y);

}
```

OUTPUT:

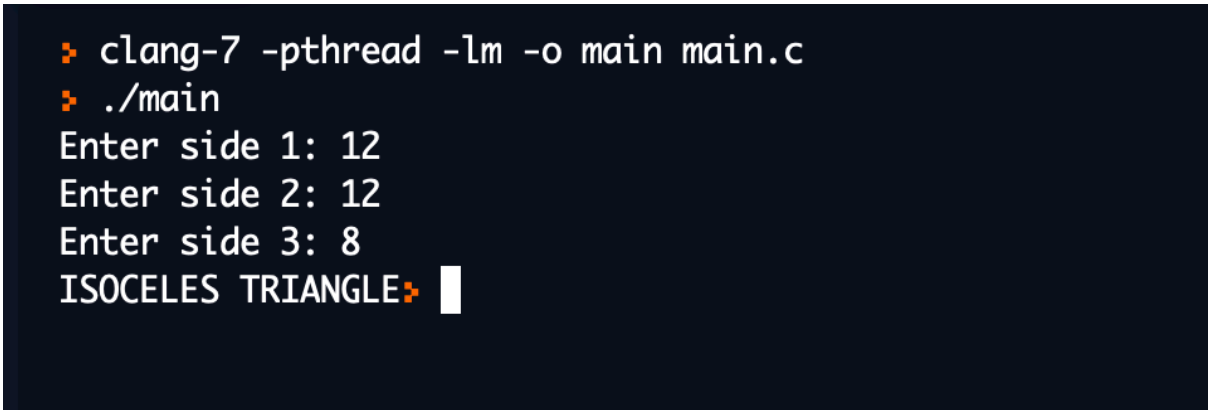


Q8. (a) Write a C program to check whether a triangle is Equilateral, scalene, or isosceles.
(b) Write a C program to check whether a triangle is right angles, obtuse, acute triangle.

(a)

```
#include <stdio.h>
int main()
{
   int a,b,c;
   printf("Enter side 1: ");
   scanf("%d", &a);
   printf("Enter side 2: ");
   scanf("%d", &b);
   printf("Enter side 3: ");
   scanf("%d", &c);
   if (a==b&&b==c)
     printf("EQUILATERAL TRIANGLE");
   else if (a==b||b==c)
     printf("ISOCELES TRIANGLE");
   else
     printf("SCALENE TRIANGLE");

}
```

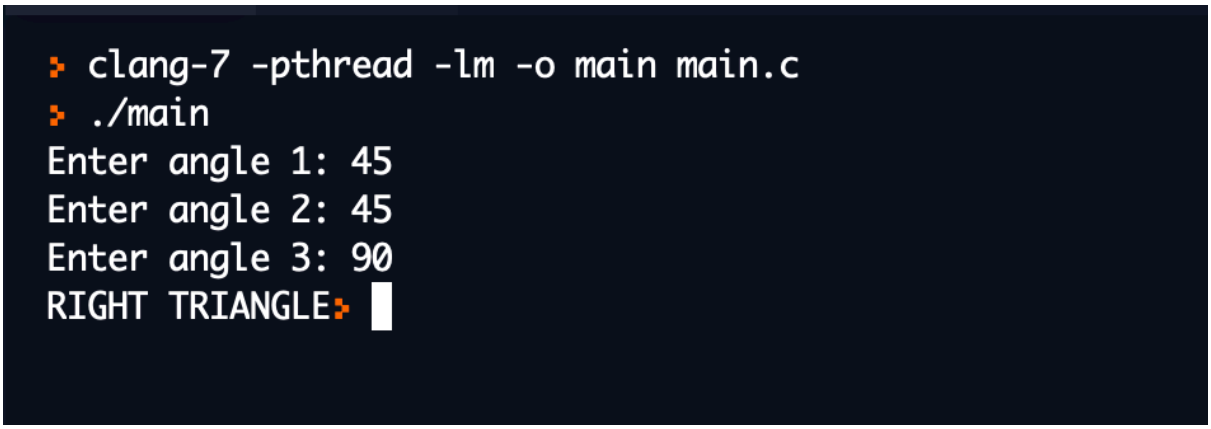
OUTPUT:



(b)

```
#include <stdio.h>
int main()
{
   int a,b,c;
   printf("Enter angle 1: ");
   scanf("%d", &a);
   printf("Enter angle 2: ");
   scanf("%d", &b);
   printf("Enter angle 3: ");
   scanf("%d", &c);
   if(a+b+c==180)
   {
   if (a==90||b==90||c==90)
     printf("RIGHT TRIANGLE");
   else if (a>90||b>90||c>90)
     printf("OBTUSE TRIANGLE");
   else
     printf("ACUTE TRIANGLE");
   }
   else
     printf("TRIANGLE NOT POSSIBLE!");

}
```

OUTPUT:



Q9. Write a C program to covert temperature from Fahrenheit to Celsius and Celsius to Fahrenheit (User must provide the choice of type of temperature).

```
#include <stdio.h>
int main()
{
   float t,r;
   int ch;
   printf("Enter temp: ");
   scanf("%f",&t);
   printf("Enter 1 for converting farenheit to celsius and 2 for vice versa: ");
   scanf("%d",&ch);
   if(ch==1)
   {
    r=(t-32)/1.8;
    printf("Temperature in celsius: ");
   }
   else if(ch==2)
   {
      r=(1.8*t)+32;
      printf("Temperature in farenheit: ");
   }
   printf("%f",r);
   return 0;
}
```

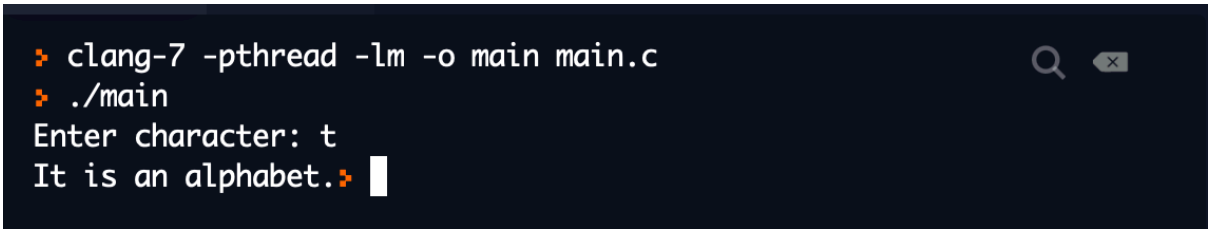
OUTPUT:

Q10. (a) Write a C program to check whether a character is an alphabet OR digit.
(b) Write a C program a program to check whether an alphabet is a vowel or consonant.

(a)

```
#include <stdio.h>
int main()
{
   char c;
   printf("Enter character: ");
   scanf("%c",&c);
   if(c>=65&&c<=90||c>=97&&c<=122)
    printf("It is an alphabet.");
   else if(c>=48&&c<=57)
    printf("It is a digit.");
   else
    printf("It is a special character.");

}
```

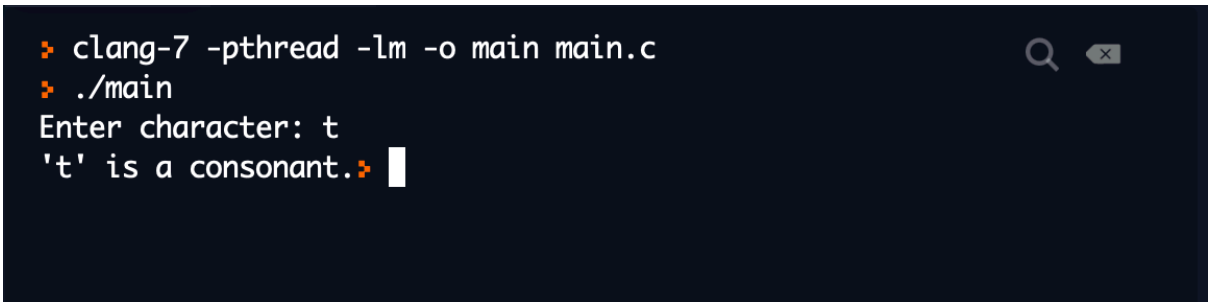
OUTPUT:



(b)

```
#include <stdio.h>
int main()
{
   char c;
   printf("Enter character: ");
   scanf("%c",&c);
   if(c>=65&&c<=90 || c>=97&&c<=122)
   {
    if(c=='A'||c=='E'||c=='I'||c=='O'||c=='U'||c=='a'||c=='e'||c=='i'||c=='o'||c=='u')
     printf("'%c' is a vowel.",c);
    else
     printf("'%c' is a consonant.",c);
   }
   else
    printf("'%c' IS NOT AN ALPHABET",c);
  }
```

OUTPUT:

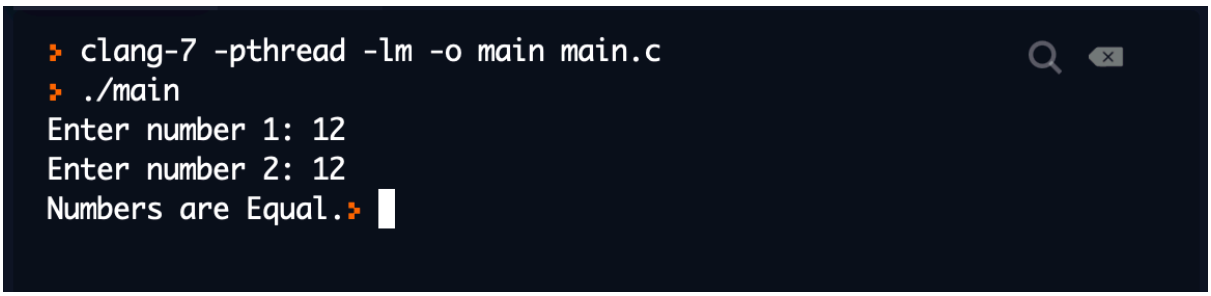


Q11. (a) Write a C program to find smallest of two numbers.
(b) Write a C program to find largest of three numbers.

(a)

```
#include <stdio.h>
int main()
{
   int n1,n2;
   printf("Enter number 1: ");
   scanf("%d",&n1);
   printf("Enter number 2: ");
   scanf("%d",&n2);
   if(n1<n2)
    printf("%d is smaller among the two numbers.",n1);
   else if(n2<n1)
    printf("%d is smaller among the two numbers.",n2);
   else
    printf("Numbers are Equal.");
 }
```

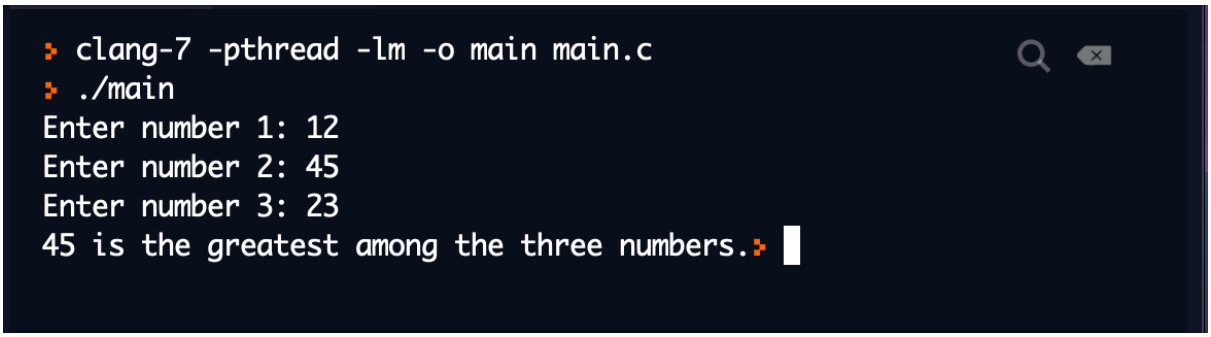
OUTPUT:



(b)

```
#include <stdio.h>
int main()
{
   int n1,n2,n3;
   printf("Enter number 1: ");
   scanf("%d",&n1);
   printf("Enter number 2: ");
   scanf("%d",&n2);
   printf("Enter number 3: ");
   scanf("%d",&n3);
   if(n1>n2&&n1>n3)
    printf("%d is the greatest among the three numbers.",n1);
   else if(n2>n1&&n2>n3)
    printf("%d is the greatest among the three numbers.",n2);
   else if(n3>n1&&n3>n2)
    printf("%d is the  greatest among the three numbers.",n3);
   else
    printf("Numbers are equal.");
  }
```

OUTPUT:



Q12. Write a program in C to implement Simple Calculator.

```
#include <stdio.h>
int main()
 {
   char op;
   double a,b;
   printf("Enter an operator (+, -, *,/): ");
   scanf("%c", &op);
   printf("Enter two operands: ");
   scanf("%lf %lf", &a, &b);

   switch (op)
   {
   case '+': printf("%.2lf + %.2lf = %.2lf", a, b, a + b);
           break;
   case '-': printf("%.2lf - %.2lf = %.2lf", a, b, a - b);
           break;
   case '*': printf("%.2lf * %.2lf = %.2lf", a, b, a * b);
           break;
   case '/': printf("%.2lf / %.2lf = %.2lf", a, b, a / b);
           break;
   default : printf("Error! operator is not correct");
   }
}
```

OUTPUT:

Q13. WAP to calculate the root of a Quadratic Equation.

```
#include <math.h>
#include <stdio.h>
#include <stdlib.h>
void main()
{
  int a,b,c;
  printf("Enter value of a: ");
  scanf("%d",&a);
  printf("Enter value of b: ");
  scanf("%d",&b);
  printf("Enter value of c: ");
  scanf("%d",&c);
  if (a == 0)
    {
      printf("Invalid");
      return;
    }

    int d = b * b - 4 * a * c;
    double sqrt_val = sqrt(abs(d));

    if (d > 0)
    {
      printf("Roots are real and different \n");
      printf("%f\n%f", (double)(-b + sqrt_val) / (2 * a),
            (double)(-b - sqrt_val) / (2 * a));
    }
    else if (d == 0)
    {
      printf("Roots are real and same \n");
      printf("%f", -(double)b / (2 * a));
    }
    else
    {
      printf("Roots are complex \n");
      printf("%f + i%f\n%f - i%f", -(double)b / (2 * a),
            sqrt_val, -(double)b / (2 * a), sqrt_val);
    }
}
```

OUTPUT:

```
Enter value of a: 1
Enter value of b: 2
Enter value of c: 1
Roots are real and same
-1.000000exit status 9
```

Q14. WAP to accept a coordinate point in a XY coordinate system and determine in which quadrant the coordinate point lies.

```
#include<stdio.h>
void main()
{
   int a,b;
   printf("enter the co-ordinates\n");
   printf("Enter value: ");
   scanf("%d",&a);
   printf("Enter value: ");
   scanf("%d",&b);
   int *ptr1=&a;
   int *ptr2=&b;
   if(*ptr1>=0)
   {
      if(*ptr2>=0)
      {
         printf("first quadrant");
      }
      else
      {
         printf("fourth quadrant");
      }
   }
   else
   {
      if(*ptr2>=0)
      {
         printf("second quadrant");
      }
      else
      {
         printf("third quadrant");
      }
   }
}
```

OUTPUT:

Q15. Write a program to find gross salary of employee if DA is 40% of basic Salary and HRA is 20% of basic salary. Basic salary will be entered as input by keyboard.

```
#include <math.h>
void main()
{
  float bs;
  printf("Enter basic salary: ");
  scanf("%f",&bs);
  printf("Gross salary: %.2f",(bs+.4*bs+.2*bs));
}
```

OUTPUT:

```
> ./main
Enter basic salary: 1000
Gross salary: 1600.00exit status 21
```

Q16. Write a program in C to calculate and print the Electricity bill of a given customer. The customer id and unit consumed by the user should be taken from the keyboard and display the total amount to pay to the customer.
up to 199----------1.20
200-500----------1.80
Above 500----------2.00
If bill exceeds Rs. 400 then a surcharge of 15% will be charged and the minimum bill should be of Rs. 100/-

```
#include <math.h>
void main()
{
  char cid[30];float u,b;
  printf("Enter Customer ID: ");
  scanf("%s",&cid);
  printf("Enter number of units consumed: ");
  scanf("%f",&u);
  if(u<200)
    b=u*1.20;
  else if(u<500)
    b=(199*1.20)+(u-199)*1.80;
  else
    b=(199*1.20)+(301*1.50)+(u-500)*2.00;
  if(b<100)
   printf("BILL\nCUSTOMER ID: %s\nTotal Bill Amount: 100",cid);
  else if(b>400)
    printf("BILL\nCUSTOMER ID: %s\nTotal Bill Amount: %.2f",cid,1.15*b);
  else
  printf("BILL\nCUSTOMER ID: %s\nTotal Bill Amount: %.2f",cid,b);
}
```

OUTPUT:

Q17. A library charges a fine for every book returned late. For first 5 days the fine is 50 paisa, for 6-10 days, fine is one rupee and above 10 days, fine is 5 rupees. If you return the book after 30 days your membership will be cancelled. Write a program to accept the number of days the member is late to return the book and display the fine or appropriate message.

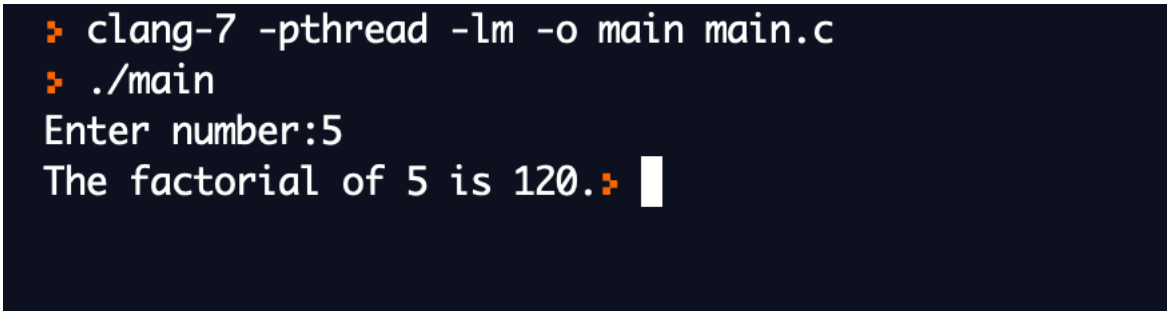
```
#include <math.h>
void main()
{
  int d;
  printf("Enter number of days late: ");
  scanf("%d",&d);
  if(d<=5)
    printf("Your fine is %.2f.",d*.50);
  else if(d<=10)
    printf("Your fine is %.2f.",2.50+(d-5)*1.00);
  else
    printf("Your fine is %.2f.",7.50+(d-10)*5);
  if(d>30)
    printf("\nYOUR MEMBERSHIP IS CANCELLED!");
}
```

OUTPUT:

Q18. Write a program to find the factorial of any number.

```
#include <stdio.h>

int main(void) {
  int n;int f=1;
  printf("Enter number:");
  scanf("%d",&n);
  for(int i=n;i>0;--i)
   f*=i;
  printf("The factorial of %d is %d.",n,f) ;
  return 0;
}
```

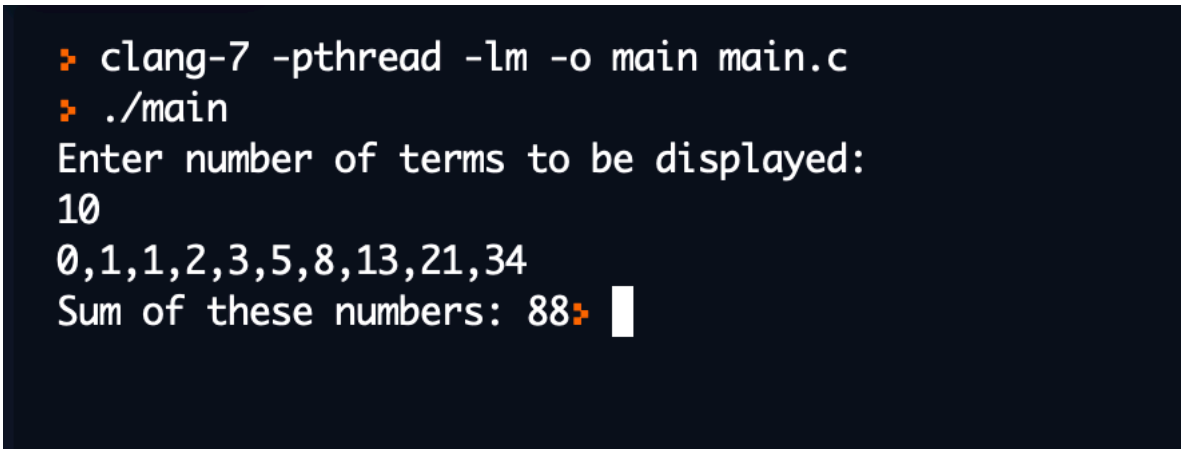
OUTPUT:



Q19. Write a program to print Fibonacci sequence
0 1 1 2 3 5 8 13…… N terms and prints the sum of sequence.

```
#include <stdio.h>

int main(void) {
  int n,n1=0,n2=1,n3,sum=1;
  printf("Enter number of terms to be displayed:\n");
  scanf("%d",&n);

  printf("%d,%d",n1,n2);
  for(int i=2;i<n;++i)
  {
    n3=n1+n2;
    sum+=n3;
    printf(",%d",n3);
    n1=n2;
    n2=n3;
  }
printf("\nSum of these numbers: %d",sum);
}
```

OUTPUT:



Q20. Write a program in C to accept an integer numbers and find sum of digits.

```
#include <stdio.h>
int sum=0;
int SoD(int n)
{
 if(n!=0)
 {
     sum+=n%10;
     SoD(n/10);
  }
     return sum;
 }

void main()
{
   int n;
   printf("Enter number: ");
   scanf("%d",&n);
   printf("Sum of Digits of %d is %d. ",n,SoD(n));

}
```

OUTPUT:

Q21. Write a program in C to accept an integer numbers and find reverse of this number and check this number for palindrome.

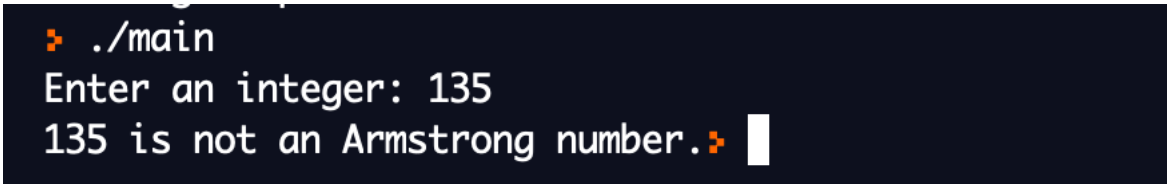
```
#include <stdio.h>
int reverse(int n)
{
static int sum=0,rem;
 if(n!=0)
 {
     rem=n%10;
     sum=sum*10+rem;
     reverse(n/10);
  }
     return sum;
 }

void main()
{
 int n;
 printf("Enter number: ");
   scanf("%d",&n);
   if(n==reverse(n))
    printf("%d is a Palindrome number.",n);
   else
    printf("%d is not a Palindrome number.",n);
}
```

OUTPUT:

Q22. Write a program in C to accept an integer numbers and to check a number is Armstrong or not.

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

int main() {
   int n, t, r, a = 0;
   float ans = 0.0;
   printf("Enter an integer: ");
   scanf("%d", &n);
   t=n;
   for (t = n; t != 0; ++a)
       t /= 10;

  for (t = n; t != 0; t /= 10)
  {
      r = t % 10;
      ans += pow(r, a);
   }
   if ((int)ans == n)
    printf("%d is an Armstrong number.", n);
   else
    printf("%d is not an Armstrong number.", n);
   return 0;
}
```

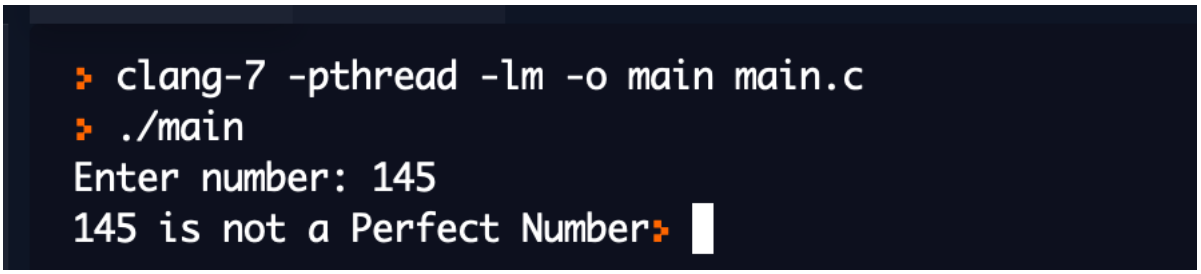
OUTPUT:



Q23. Write a program in C to accept an integer numbers and to check a number is Perfect or not.

```
#include <stdio.h>
int main()
{
   int n,r, sum= 0;
   printf("Enter number: ");
   scanf("%d", &n);
  for (int i=1;i<=n/2;++i)
    if(n%i==0)
        sum+=i;
  if(sum==n)
    printf("%d is a Perfect Number.",n);
  else
    printf("%d is not a Perfect Number",n);
}
```

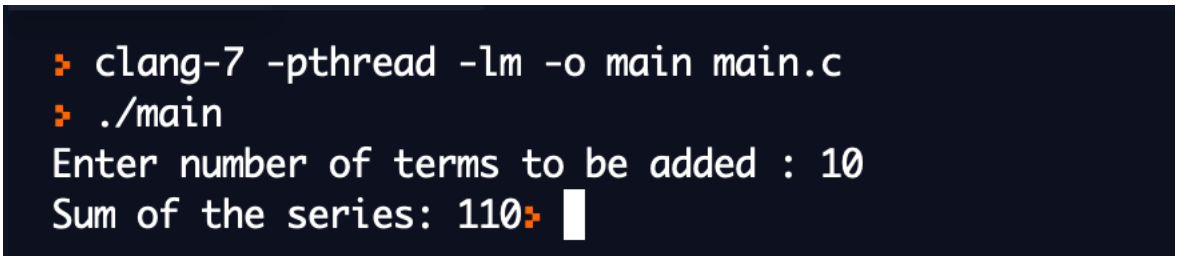
OUTPUT:



Q24. Write a program to find the sum of following series:
S = 2+4+6+8+……N terms.

```
#include <stdio.h>
int main()
{
   int n,sum= 0;
   printf("Enter number of terms to be added : ");
   scanf("%d", &n);
  for (int i=0,k=2;i<n;++i,k+=2)
   sum+=k;
  printf("Sum of the series: %d",sum);
}
```

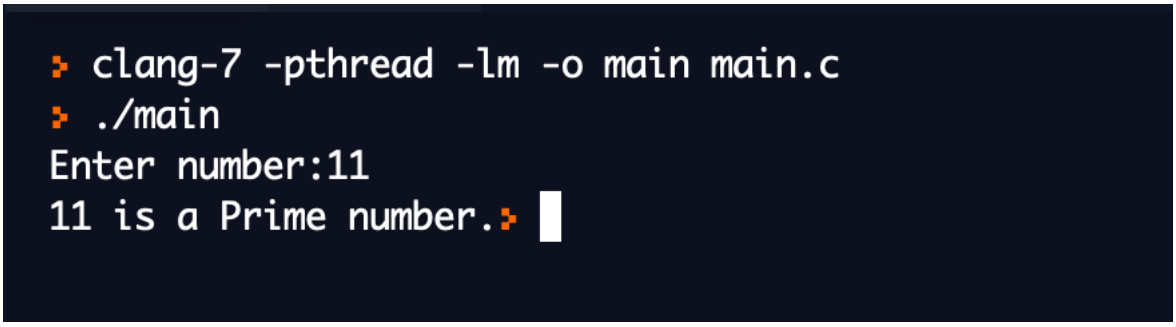
OUTPUT:



Q25. Write a program to check a number whether it is prime number or not.

```
#include <stdio.h>


int main(void) {
  int n;int f=0;
  printf("Enter number:");
  scanf("%d",&n);
  for(int i=2;i<=n/2;++i)
   {
     if(n%i==0)
     f=1;
   }
   if(f==0)
    printf("%d is a Prime number.",n);
  else
    printf("%d is not a Prime number.",n);


}
```

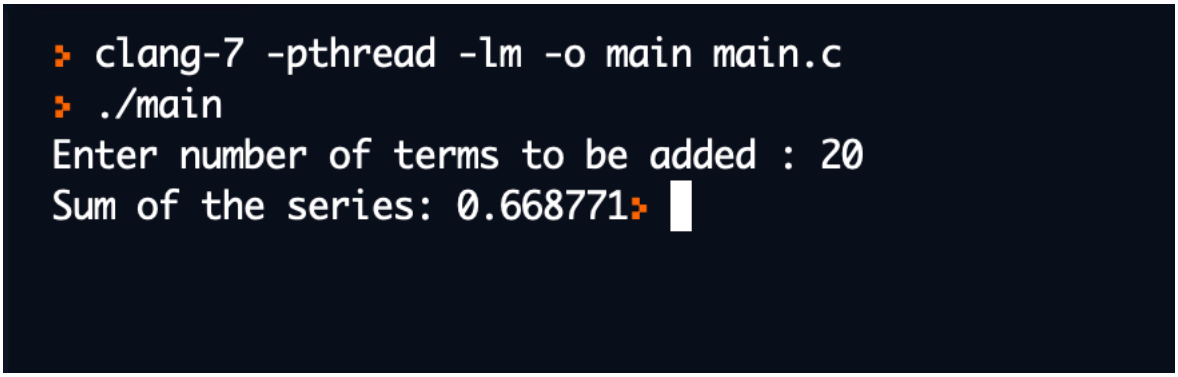
OUTPUT:



Q26. Write a program to find the sum of following series:
1 – 1/2 + 1/3 – 1/4 + 1/5 - …… up to n terms.

```
#include <stdio.h>
int main ()
{
   int n;float sum= 0.0;
   printf("Enter number of terms to be added : ");
   scanf("%d", &n);
  for (int i=1;i<=n;++i)
  {
    if(i%2==0)
     sum-=1.0/i;
    else
     sum+=1.0/i;
  }
   printf("Sum of the series: %f",sum);
}
```

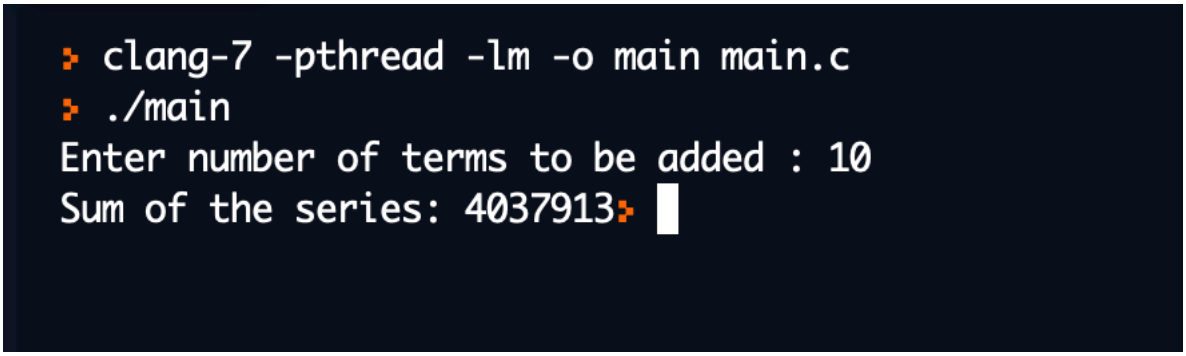
OUTPUT:



Q27. Write a program to find the sum of following series:
1! + 2! + 3! + 4! + ….. + n!

```
#include <stdio.h>
int fact(int a)
{
  if(a==0||a==1)
    return 1;
  else
    return a*fact(a-1);
}
int main()
{
   int n,sum= 0.0;
   printf("Enter number of terms to be added : ");
   scanf("%d", &n);
  for (int i=1;i<=n;++i)
  {
      sum+=fact(i);
  }
   printf("Sum of the series: %d",sum);
}
```

OUTPUT:



Q28. Write a program to find the sum of following series:
S = $-1^3 + 3^3 - 5^3 + 7^3 - 9^3 + 11^3$ - ……. N terms.

```
#include <stdio.h>

int main()
{
  int n,sum= 0;
  printf("Enter number of terms to be added : ");
  scanf("%d", &n);
 for (int i=1,k=1;i<=n;++i,k+=2)
 {
    if(i%2!=0)
     sum-=k*k*k;
    else
      sum+=k*k*k;
 }
  printf("Sum of the series: %d",sum);
}
```

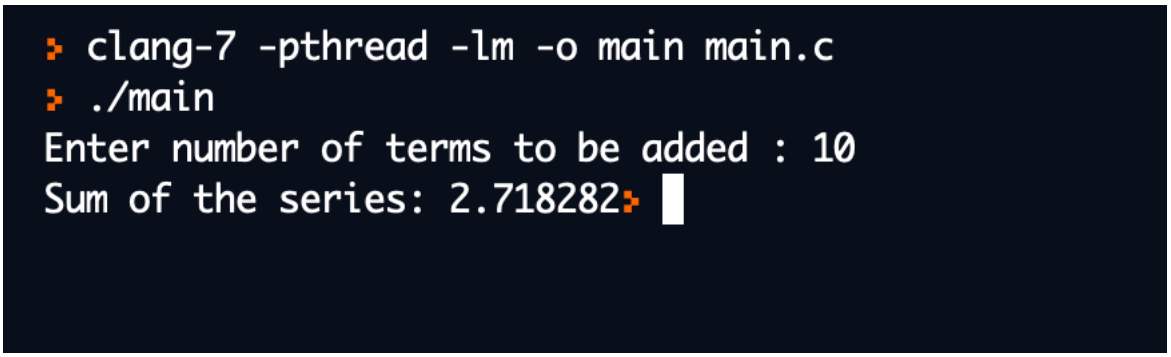
OUTPUT:

```
clang-7 -pthread -lm -o main main.c
./main
Enter number of terms to be added : 10
Sum of the series: 3970
```

Q29. Write a program to find the sum of following series:
S = 1/1! + 2/2! + 3/3! + …….. n terms.

```
#include <stdio.h>
float fact(int a)
{
  if(a==0||a==1)
    return 1.0;
  else
    return a*fact(a-1);
}
int main()
{
   int n;float sum= 0.0;
   printf("Enter number of terms to be added : ");
   scanf("%d", &n);
  for (int i=1;i<=n;++i)
  {
     sum+=i/fact(i);
  }
   printf("Sum of the series: %f",sum);
}
```

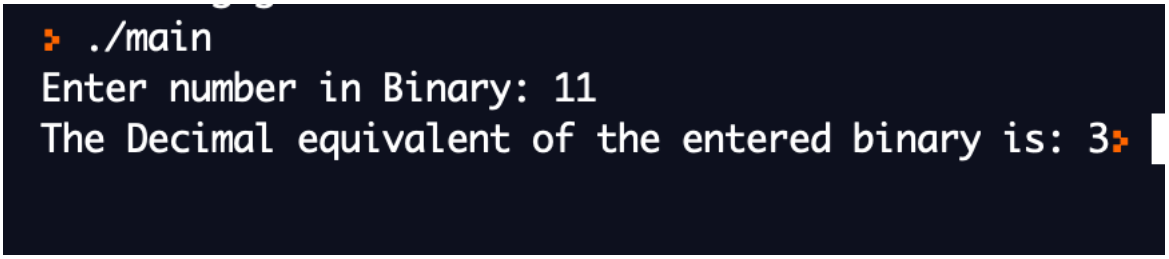
OUTPUT:



Q30. Write a program to convert binary number to decimal number.

```
#include <stdio.h>
#include <math.h>
int main()
{
   char c[100];int n=-1,dec=0,k=0;
   printf("Enter number in Binary: ");
   scanf("%s", &c);
  for (int i=0;i<100;++i)
   {
      if(c[i]=='\0')
        break;
      else
        ++n;
    }

    for(int i=n;i>=0;--i)
     dec+=(c[i]-48)*(int)pow(2,k++);
    printf("The Decimal equivalent of the entered binary is: %d",dec);
}
```

OUTPUT:



Q31. Write a program to find the sum of following series:
$S = 1^4 + 3^4 + 5^4 + 7^4 + \ldots\ldots\ldots\ldots$ 100 terms

```
#include <stdio.h>

int main()
{
   int sum= 0;

  for (int i=1,k=1;i<=100;++i,k+=2)
      sum+=k*k*k*k;
  printf("Sum of the series: %d",sum);
}
```

OUTPUT:

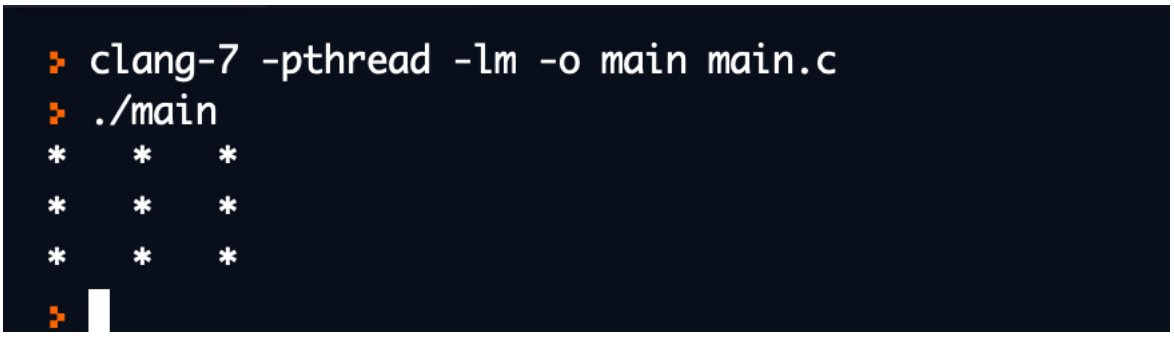
```
clang-7 -pthread -lm -o main main.c
./main
Sum of the series: 1932562308
```

Q32. Write a program in C to print the given pattern.

```
*       *       *
*       *       *
*       *       *
```

```
#include <stdio.h>

int main()
{
  for(int i=0;i<3;++i)
  {
     for(int j=0;j<3;++j)
      printf("*\t");
     printf("\n");
  }
}
```

OUTPUT:

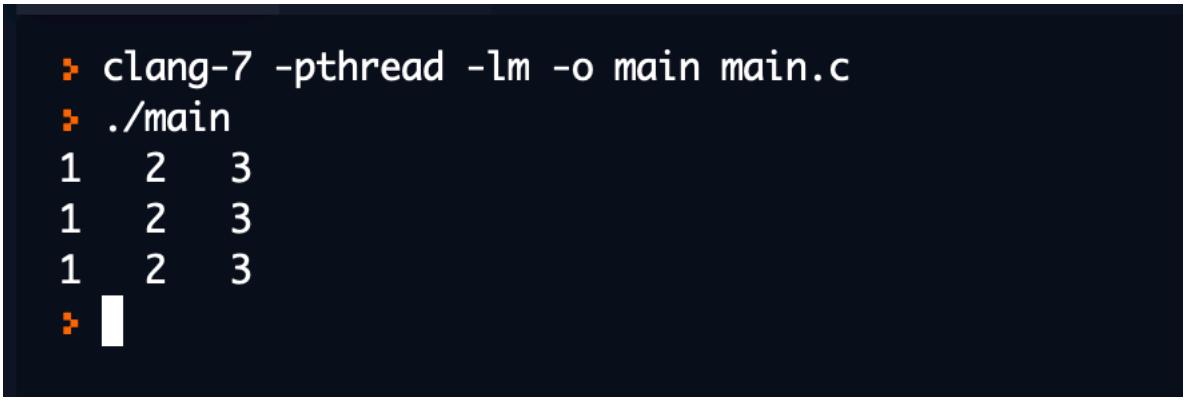


Q33. Write a program in C to print the given pattern.

```
1	2	3
1	2	3
1	2	3
```

```
#include <stdio.h>

int main()
{
  for(int i=0;i<3;++i)
  {
     for(int j=1;j<=3;++j)
      printf("%d\t",j);
     printf("\n");
  }
}
```

OUTPUT:

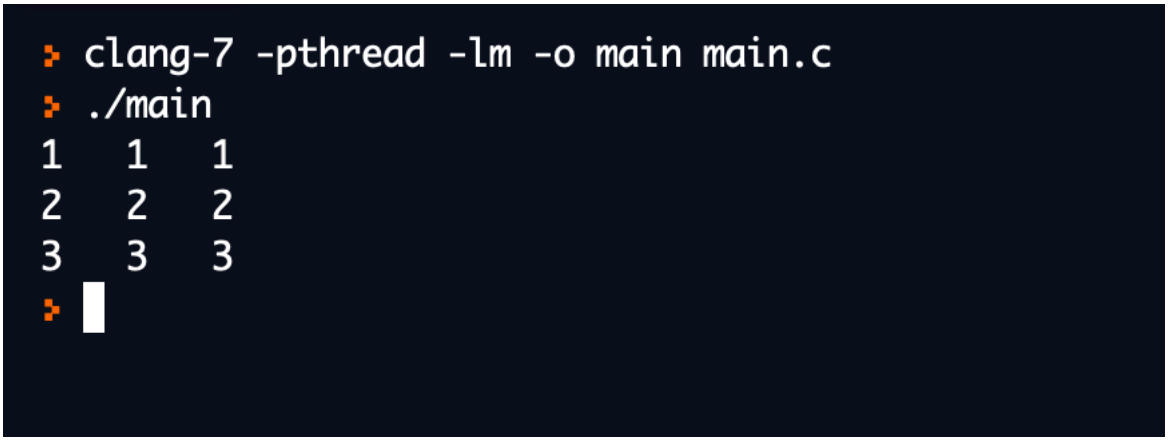


Q34. Write a program in C to print the given pattern.

```
1       1       1
2       2       2
3       3       3
```

```
#include <stdio.h>

int main()
{
  for(int i=1;i<=3;++i)
  {
     for(int j=1;j<=3;++j)
      printf("%d\t",i);
     printf("\n");
  }
}
```

OUTPUT:

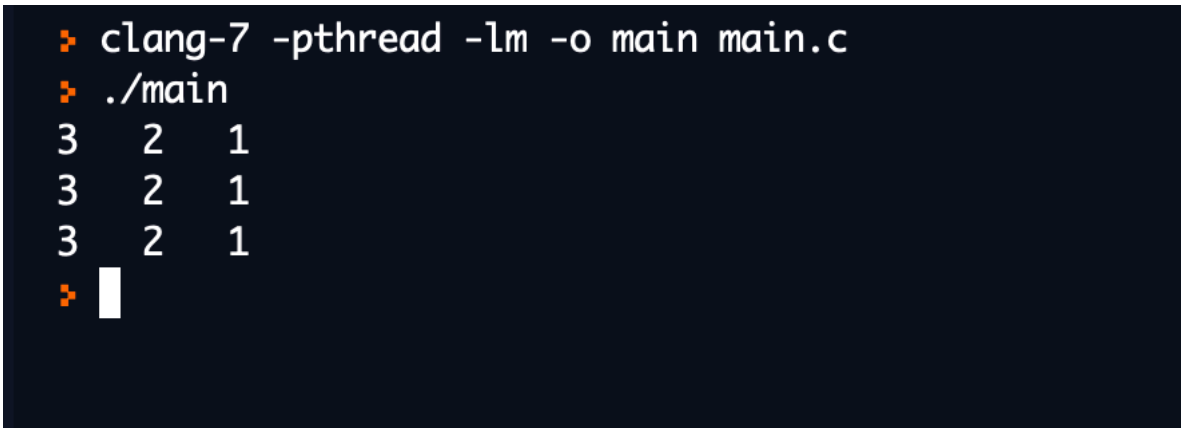


Q35. Write a program in C to print the given pattern.

```
3       2       1
3       2       1
3       2       1
```

```
#include <stdio.h>

int main()
{
  for(int i=1;i<=3;++i)
  {
     for(int j=3;j>=1;--j)
      printf("%d\t",j);
     printf("\n");
  }
}
```

OUTPUT:

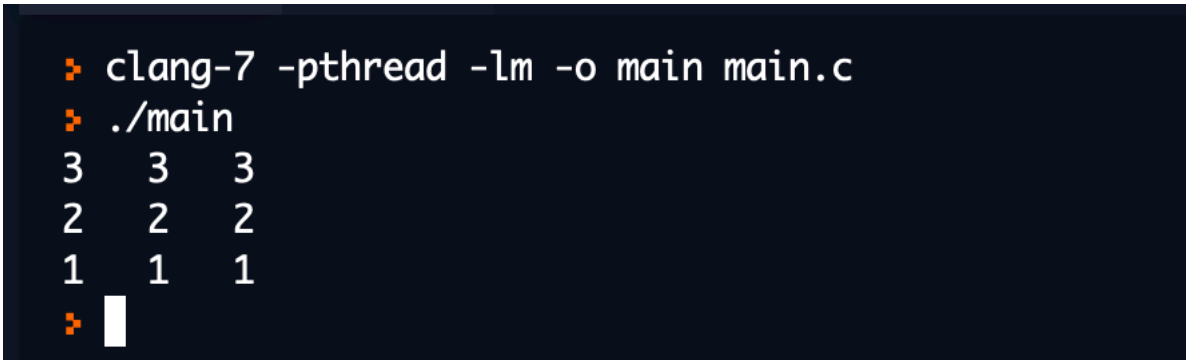


Q36. Write a program in C to print the given pattern.

```
3       3       3
2       2       2
1       1       1
```

```
#include <stdio.h>

int main()
{
  for(int i=3;i>=1;--i)
  {
     for(int j=3;j>=1;--j)
      printf("%d\t",i);
     printf("\n");
  }
}
```

OUTPUT:

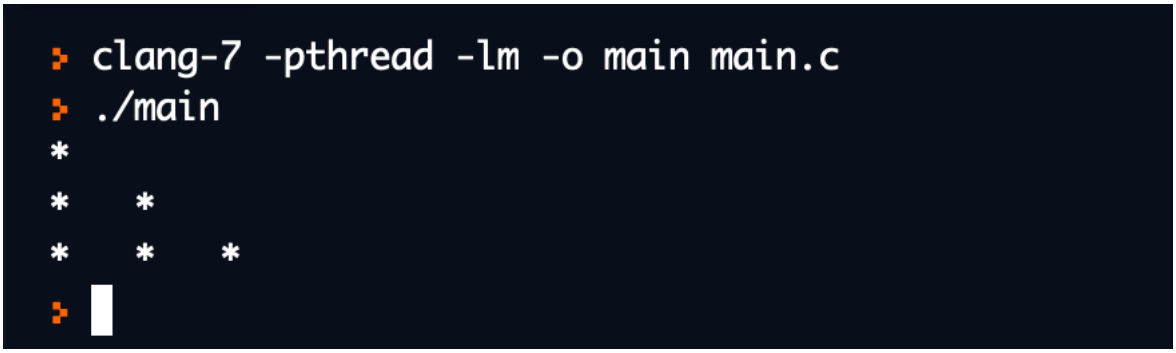


Q37. Write a program in C to print the given pattern.

```
*
*       *
*       *       *
```

```
#include <stdio.h>

int main()
{
  for(int i=1;i<=3;++i)
  {
     for(int j=1;j<=i;++j)
      printf("*\t");
     printf("\n");
  }
}
```

OUTPUT:

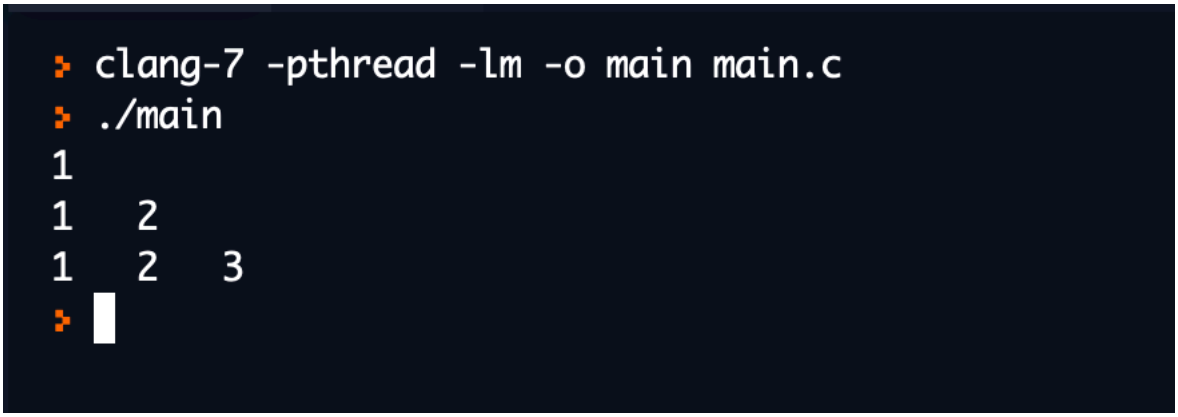


Q38. Write a program in C to print the given pattern.

```
1
1       2
1       2       3
```

```
#include <stdio.h>

int main()
{
  for(int i=1;i<=3;++i)
  {
     for(int j=1;j<=i;++j)
      printf("%d\t",j);
     printf("\n");
  }
}
```

OUTPUT:

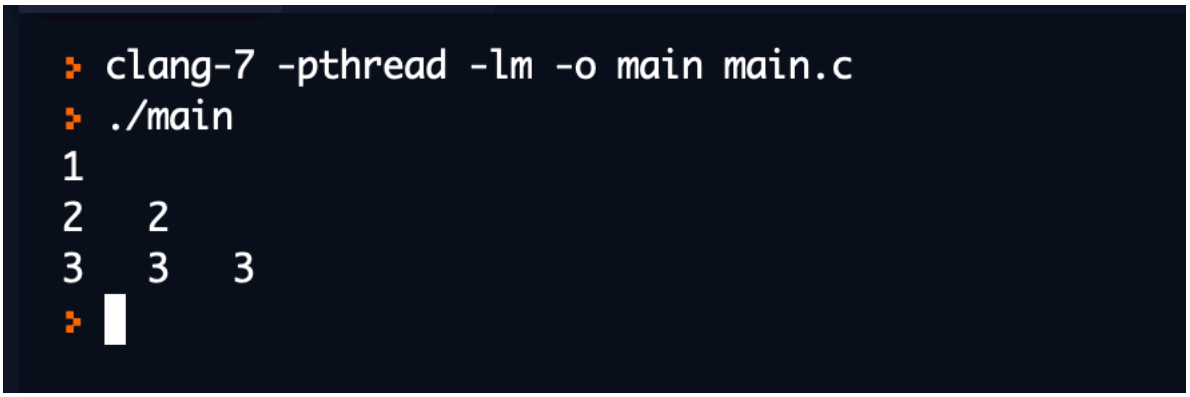


Q39. Write a program in C to print the given pattern.

```
1
2       2
3       3       3
```

```
#include <stdio.h>

int main()
{
  for(int i=1;i<=3;++i)
  {
     for(int j=1;j<=i;++j)
      printf("%d\t",i);
     printf("\n");
  }
}
```

OUTPUT:

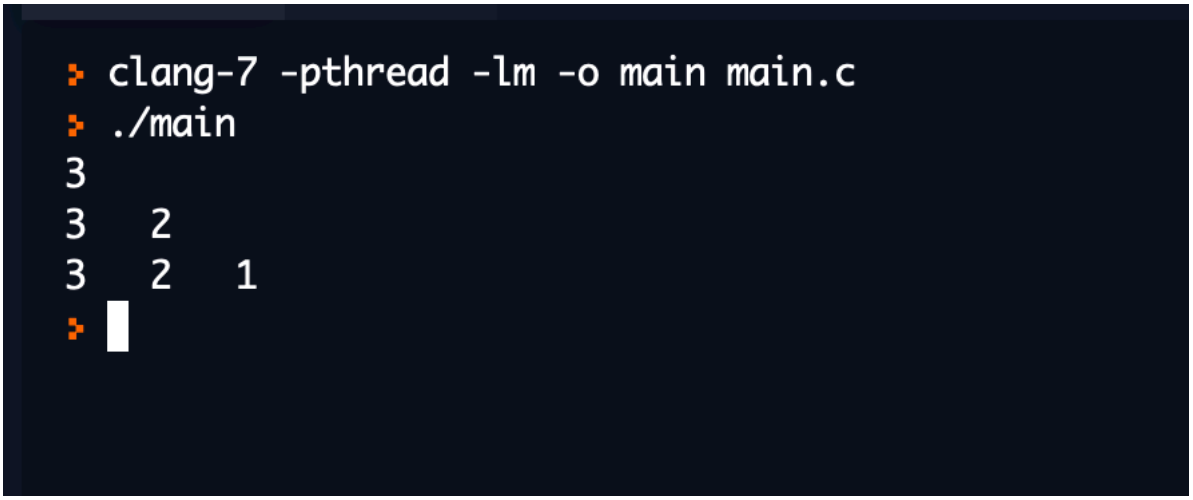


Q40. Write a program in C to print the given pattern.

```
3
3       2
3       2       1
```

```
#include <stdio.h>

int main()
{
  for(int i=3;i>=1;--i)
  {
     for(int j=3;j>=i;--j)
      printf("%d\t",j);
     printf("\n");
  }
}
```

OUTPUT:

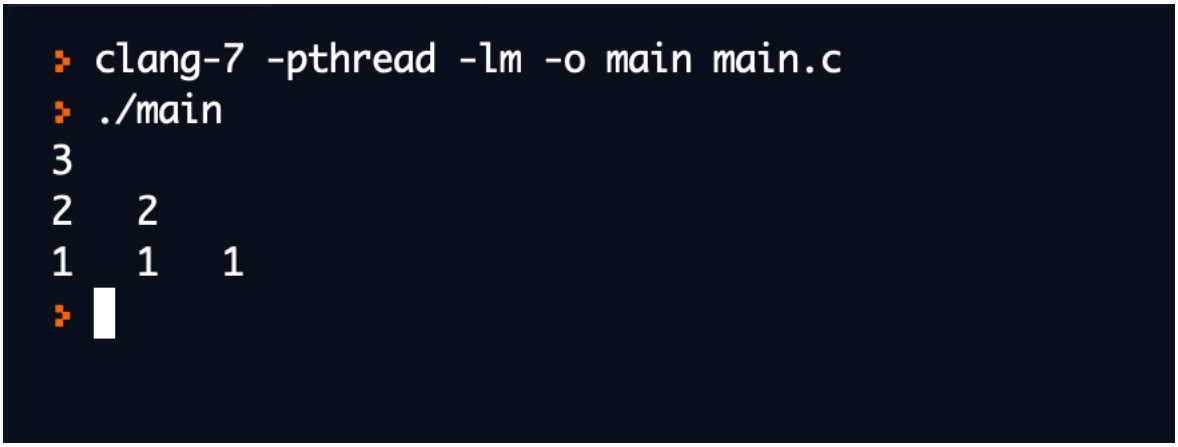


Q41. Write a program in C to print the given pattern.

```
3
2          2
1          1          1
```

```
#include <stdio.h>

int main()
{
  for(int i=3;i>=1;--i)
  {
     for(int j=3;j>=i;--j)
      printf("%d\t",i);
     printf("\n");
  }
}
```

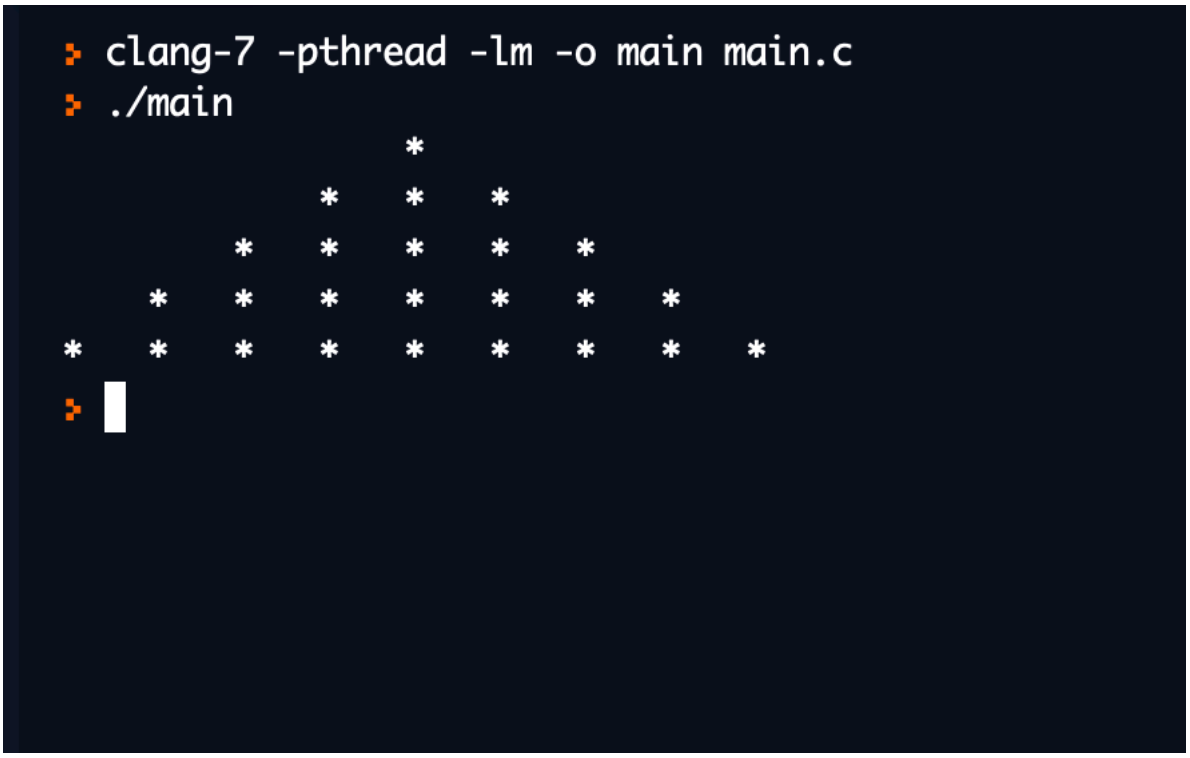
OUTPUT:



Q42. Write a program in C to print the given pattern.

```
#include <stdio.h>
int main()
{
  int i, s, k = 0;
  for (i = 1; i <= 5; ++i, k = 0)
 {
    for (s = 1; s <= 5 - i; ++s)
    {
      printf("\t");
    }
    while (k != 2 * i - 1) {
      printf("*\t");
      ++k;
    }
    printf("\n");
  }
}
```

OUTPUT:



Q43. Write a program in C to print the given pattern.

```
                1
            1   2   1
        1   2   3   2   1
    1   2   3   4   3   2   1
```

```
#include <stdio.h>

void main()
{
  int i,j;
  for(i=0;i<=5;i++)
  {
   for(j=1;j<=5-i;j++)
            printf("\t");
   for(j=1;j<=i;j++)
     printf("%d\t",j);
   for(j=i-1;j>=1;j--)
           printf("%d\t",j);
   printf("\n");
  }
}
```

OUTPUT:

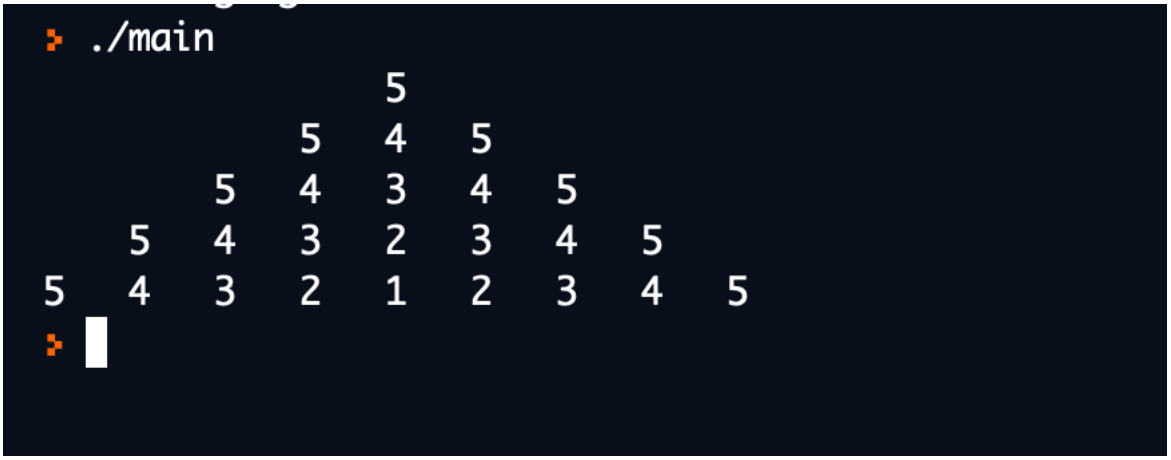
```
1 warning generated.
> ./main

                1
            1   2   1
        1   2   3   2   1
    1   2   3   4   3   2   1
1   2   3   4   5   4   3   2   1
```

Q44. Write a program in C to print the given pattern.

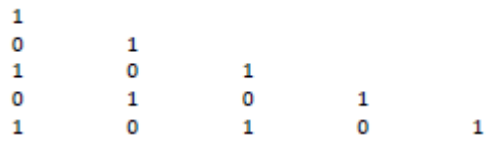
```
                5
            5   4   5
        5   4   3   4   5
    5   4   3   2   3   4   5
5   4   3   2   1   2   3   4   5
```

```
#include <stdio.h>

void main()

  {
    int i=1,j,k,l,m;
    for(i=1,m=5; i<=5,m>=1; i++,m--)

    {
          for(j=5-i; j>=1; j--)
           printf("\t");
          for(k=5; k>=6-i; k--)
           printf("%d\t",k);
          for(l=m+1; l<=5;l++)
           printf("%d\t",l);
          printf("\n");

          }
}
```

OUTPUT:



45. Write a program in C to print the given pattern.



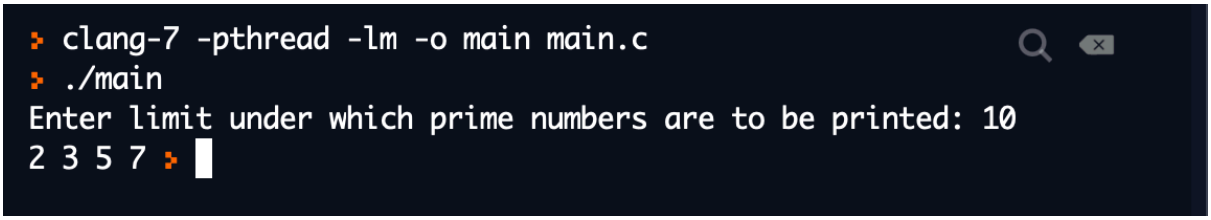

```
#include <stdio.h>

void main()
{
   int i,j;
   for(i=0;i<=6;i++)
 {
  for(j=1;j<i;j++)
  {
   if((i+j)%2==0)
   {
  printf("0\t");
   }
 else
 {
  printf("1\t");
 }
  }
 printf("\n");
 }
}
```

OUTPUT:

Q46.Write a program to print all prime numbers <= a given number.

```
#include <stdio.h>
#include <stdbool.h>
bool prime(int n)
{
   int f=0;
   for(int i=2;i<=n/2;++i)
   {
    if(n%i==0)
    f=1;
   }
  if(f==0)
   return true;
 else
   return false;

}

int main()
{
   int n;
   printf("Enter limit under which prime numbers are to be printed: ");
   scanf("%d",&n);
  for(int i=2;i<=n;++i)
   {
      if(prime(i))
       printf("%d ",i);
   }
}
```

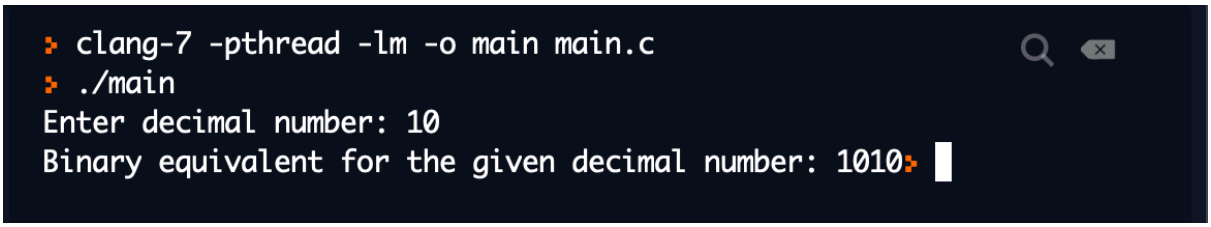
OUTPUT:



Q47. Write a program to convert Decimal number to Binary Number.

```
#include <stdio.h>
int main()
{
   int n;
   printf("Enter decimal number: ");
   scanf("%d",&n);
   int bin[32];
   int i = 0;
   while (n > 0)
   {
      bin[i] = n % 2;
      n = n / 2;
      i++;
   }
   printf("Binary equivalent for the given decimal number: ");
   for (int j = i - 1; j >= 0; j--)
      printf("%d",bin[j]);
}
```

OUTPUT:



Q48. Write a program to find product, sum, average, max and min from a list of n numbers.

```
#include <stdio.h>
int main()
{
   int n,p=1;float s=0.0;
   printf("How many elements you want to enter: ");
   scanf("%d",&n);
   int arr[n];
   for(int i=0;i<n;++i)
   {
      printf("Enter element %d: ",i+1);
      scanf("%d",&arr[i]);
      p*=arr[i];
      s+=arr[i];
   }
   for (int c = 0 ; c < n - 1; c++)
  {
   for (int d = 0 ; d < n - c - 1; d++)
   {
    if (arr[d] > arr[d+1])
    {
     int swap       = arr[d];
     arr[d]   = arr[d+1];
     arr[d+1] = swap;
    }
   }
  }
   printf("Product of elements: %d\nSum of elements: %d\nAverage of elements:
%f\nMaximum Value: %d\nMinimum Value: %d",p,(int)s,s/n,arr[n-1],arr[0]);
}
```

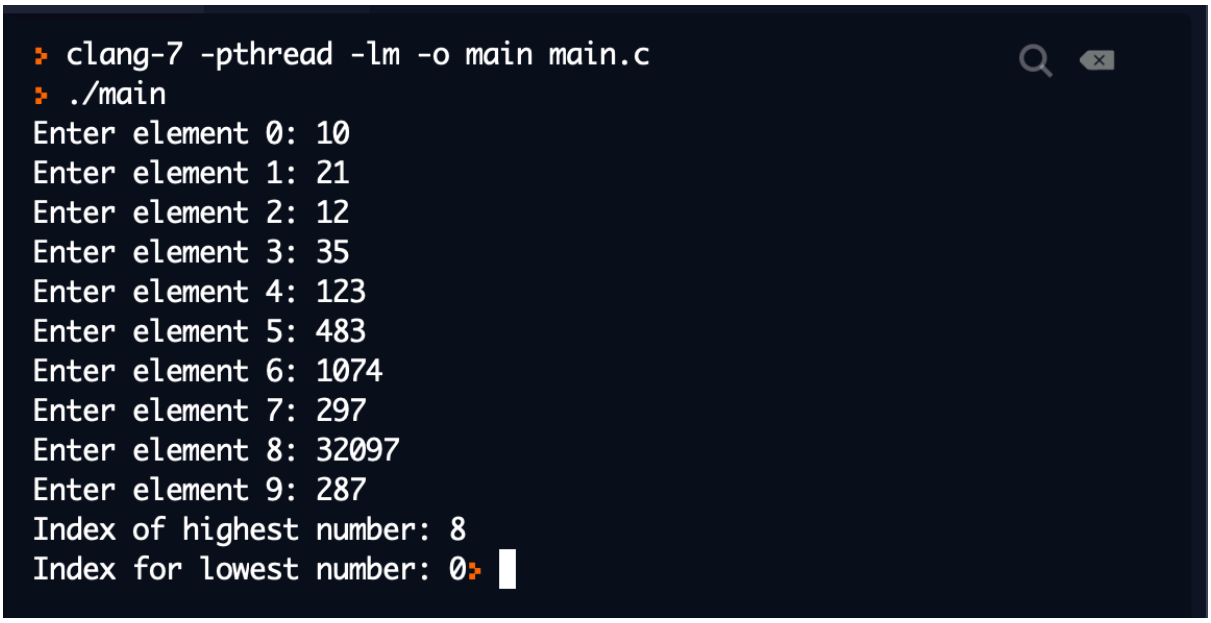
OUTPUT:

```
How many elements you want to enter: 2
Enter element 1: 12
Enter element 2: 9
Product of elements: 108
Sum of elements: 21
Average of elements: 10.500000
Maximum Value: 12
Minimum Value: 9
```

Q49. Write a program in C to display the index of smallest and largest element in 10 integers.

```
#include <stdio.h>
int main()
{
  int a[10];
  for(int i=0;i<10;++i)
  {
     printf("Enter element %d: ",i);
     scanf("%d",&a[i]);
  }
  int s=0,h=0;
  for(int i=1;i<10;++i)
  {
     if(a[i]>a[h])
       h=i;
     else if(a[i]<a[s])
       s=i;
  }
  printf("Index of highest number: %d\nIndex for lowest number: %d",h,s);
}
```

OUTPUT:



Q50. Write a program in C to display the index of smallest and largest element in 3 X 4 matrix of integers.

```
#include <stdio.h>
void main()
{
 int a[3][4];
 for(int i=0;i<3;++i)
 {
  for(int j=0;j<4;++j)
  {
    printf("Enter element: ");
    scanf("%d",&a[i][j]);
  }
 }
 int h=0, hh=0, s=0, ss=0;
 for(int i=0;i<3;++i)
 {
  for(int j=0;j<4;++j)
  {
   if(a[i][j]>a[h][hh])
    {h=i;hh=j;}
   else if(a[i][j]<a[h][hh])
    {s=i;ss=j;}
  }
 }
 printf("Index of highest number: (%d,%d)\nIndex of smallest number: (%d,%d)",h,hh,s,ss);
}
```

OUTPUT:

```
 ./main
Enter element: 10
Enter element: 193
Enter element: 983269
Enter element: 234
Enter element: 2345
Enter element: 5745
Enter element: 435
Enter element: 346543
Enter element: 35476
Enter element: 687
Enter element: 345
Enter element: 2
Index of highest number: (0,2)
Index of smallest number: (2,3)exit status 62
```

Q51. Write a program in C that accepts N*N matrix as input and print transpose of this matrix.

```
#include <stdio.h>
void main()
{
 int n;
 printf("Enter size: ");
 scanf("%d",&n);
 int a[n][n];
 for(int i=0;i<n;++i)
 {
  for(int j=0;j<n;++j)
  {
   printf("Enter element: ");
   scanf("%d",&a[i][j]);
  }
  }
  printf("TRANSPOSE OF THE MATRIX IS:\n");
  for(int i=0;i<n;++i)
  {
   for(int j=0;j<n;++j)
    printf("%d\t",a[j][i]);
   printf("\n");
 }
}
```

OUTPUT:

```
./main
Enter size: 3
Enter element: 1
Enter element: 2
Enter element: 3
Enter element: 4
Enter element: 5
Enter element: 6
Enter element: 7
Enter element: 8
Enter element: 9
TRANSPOSE OF THE MATRIX IS:
1   4   7
2   5   8
3   6   9
```

Q52. Write a program to accept two matrices of some order. (Order must be given by user) find out the sum of these matrices and print the sum of matrices.

```
#include <stdio.h>
void main()
{
 int m,n;
 printf("Enter size: ");
 scanf("%d %d",&m,&n);
 int a[m][n],b[m][n];
 printf("ENTER ELEMENTS FOR MATRIX 1\n");
 for(int i=0;i<m;++i)
 {
  for(int j=0;j<n;++j)
  {
   printf("Enter element : ");
   scanf("%d",&a[i][j]);
  }
 }
  printf("\nENTER ELEMENTS FOR MATRIX 2\n");
  for(int i=0;i<m;++i)
  {
   for(int j=0;j<n;++j)
   {
    printf("Enter element : ");
    scanf("%d",&b[i][j]);
   }
  }
  printf("SUM OF THE MATRICES IS:\n");
  for(int i=0;i<m;++i)
  {
   for(int j=0;j<n;++j)
    printf("%d\t",a[i][j]+b[i][j]);
   printf("\n");
 }
}
```

OUTPUT:

```
> ./main
Enter size: 3
3
ENTER ELEMENTS FOR MATRIX 1
Enter element : 1
Enter element : 2
Enter element : 3
Enter element : 4
Enter element : 5
Enter element : 6
Enter element : 7
Enter element : 8
Enter element : 9

ENTER ELEMENTS FOR MATRIX 2
Enter element : 1
Enter element : 2
Enter element : 3
Enter element : 4
Enter element : 5
Enter element : 6
Enter element : 7
Enter element : 8
Enter element : 9
SUM OF THE MATRICES IS:
2   4   6
8   10  12
14  16  18
```

Q53. Write a program to find out the product/Multiplication of two matrices and print the product matrix. (order of matrices must be given by user).

```
#include <stdio.h>
void main()
{
 int m,n;
 printf("Enter size: ");
 scanf("%d %d",&m,&n);
 int a[m][n],b[m][n],c[m][n];
 printf("ENTER ELEMENTS FOR MATRIX 1\n");
 for(int i=0;i<m;++i)
 {
  for(int j=0;j<n;++j)
  {
   printf("Enter element : ");
   scanf("%d",&a[i][j]);
  }
 }
  printf("\nENTER ELEMENTS FOR MATRIX 2\n");
  for(int i=0;i<m;++i)
  {
   for(int j=0;j<n;++j)
   {
    printf("Enter element : ");
    scanf("%d",&b[i][j]);
   }
  }
   for(int i=0;i<m;++i)
  {
   for(int j=0;j<n;++j)
     {
       c[i][j]=0;
       for(int k=0;k<n;++k)
        c[i][j]+=a[i][k]*b[k][j];
     }
  }
  printf("\nPRODUCT OF THE MATRICES:\n");
   for(int i=0;i<m;++i)
   {
    for(int j=0;j<n;++j)
      printf("%d\t",c[i][j]);
    printf("\n");
   }
}
```

OUTPUT:

```
./main
Enter size: 2
2
ENTER ELEMENTS FOR MATRIX 1
Enter element : 1
Enter element : 2
Enter element : 3
Enter element : 4

ENTER ELEMENTS FOR MATRIX 2
Enter element : 5
Enter element : 6
Enter element : 7
Enter element : 8

PRODUCT OF THE MATRICES:
19  22
43  50
```

Q54. Write a program to accept two matrices of some order. (Order must be given by user) find out the subtraction of these matrices and print the sum of matrices.

```
#include <stdio.h>
void main()
{
 int m,n;
 printf("Enter size: ");
 scanf("%d %d",&m,&n);
 int a[m][n],b[m][n];
 printf("ENTER ELEMENTS FOR MATRIX 1\n");
 for(int i=0;i<m;++i)
 {
  for(int j=0;j<n;++j)
  {
   printf("Enter element : ");
   scanf("%d",&a[i][j]);
  }
 }
  printf("\nENTER ELEMENTS FOR MATRIX 2\n");
  for(int i=0;i<m;++i)
  {
   for(int j=0;j<n;++j)
   {
    printf("Enter element : ");
    scanf("%d",&b[i][j]);
   }
  }
  printf("DIFFERENCE OF THE MATRICES IS:\n");
  for(int i=0;i<m;++i)
  {
   for(int j=0;j<n;++j)
    printf("%d\t",a[i][j]-b[i][j]);
   printf("\n");
 }
}
```

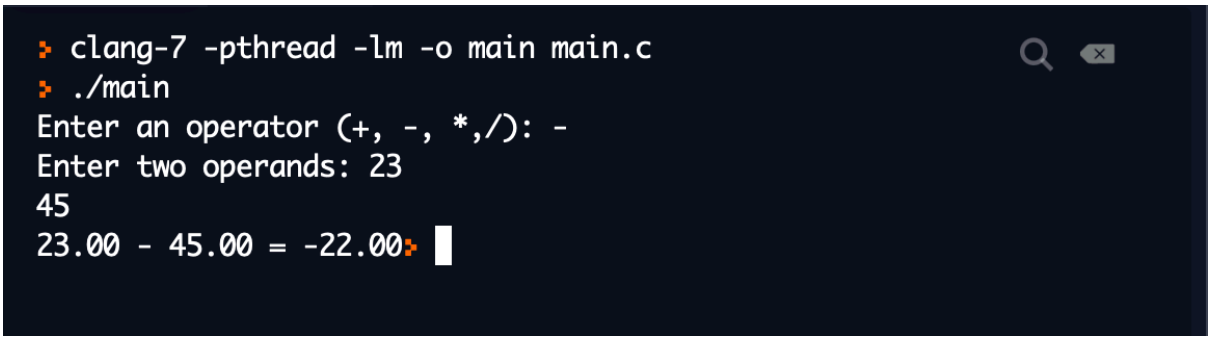
OUTPUT:

```
> ./main
Enter size: 2
2
ENTER ELEMENTS FOR MATRIX 1
Enter element : 1
Enter element : 2
Enter element : 3
Enter element : 4

ENTER ELEMENTS FOR MATRIX 2
Enter element : 5
Enter element : 6
Enter element : 7
Enter element : 8
DIFFERENCE OF THE MATRICES IS:
-4  -4
-4  -4
```

Q55. Write a C Program to implement Simple Calculator (Addition, Subtraction, Multiplication, Division) using the concept of function.

```
#include <stdio.h>
void add(double a,double b)
{
  printf("%.2lf + %.2lf = %.2lf", a, b, a + b);
}
void sub(double a,double b)
{
  printf("%.2lf - %.2lf = %.2lf", a, b, a - b);
}
void pro(double a,double b)
{
 printf("%.2lf * %.2lf = %.2lf", a, b, a * b);
}
void div(double a,double b)
{
  printf("%.2lf / %.2lf = %.2lf", a, b, a / b);
}
int main()
 {
    char op;
    double a,b;
    printf("Enter an operator (+, -, *,/): ");
    scanf("%c", &op);
    printf("Enter two operands: ");
    scanf("%lf %lf", &a, &b);

    switch (op)
    {
    case '+': add(a,b);
              break;
    case '-': sub(a,b);
              break;
    case '*': pro(a,b);
              break;
    case '/': div(a,b);
              break;
    default : printf("Error! operator is not correct");
    }
}
```

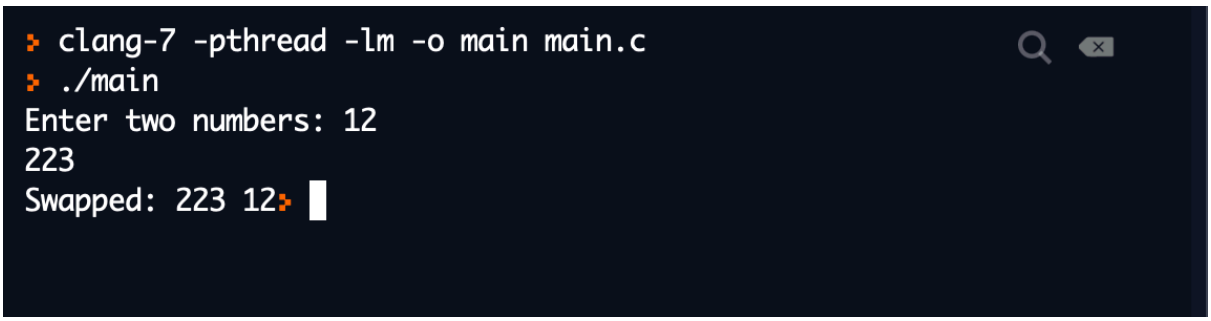
OUTPUT:


clang-7 -pthread -lm -o main main.c
./main
Enter an operator (+, -, *,/): -
Enter two operands: 23
45
23.00 - 45.00 = -22.00

Q56. Write a C Program to swap two values using function.

```
#include <stdio.h>
void swap(int a,int b)
{
  a=a+b;
  b=a-b;
  a=a-b;
  printf("Swapped: %d %d",a,b);
  }
int main(void) {
  int a,b;
  printf("Enter two numbers: ");
  scanf("%d",&a);
  scanf("%d",&b);
  swap(a,b);
  return 0;
}
```

OUTPUT:



Q57. Write a C Program to Calculate the factorial of a number using function.

```
#include <stdio.h>
int fact(int n)
{
   int f=1;
if(n==0||n==1)
  return 1;
else
 {
   for(int i=n;i>0;--i)
    f*=i;
   return f;
  }
}
int main()
 {
    int n;
    printf("Enter number: ");
    scanf("%d",&n);
    printf("Factorial of %d is: %d",n,fact(n));
}
```

OUTPUT:

Q58. Write a C Program to Calculate the factorial of a number using recursion.

```
#include <stdio.h>
int fact(int n)
{
  if(n==0||n==1)
   return 1;
  else
   return n*fact(n-1);
}
int main()
 {
   int n;
   printf("Enter number: ");
   scanf("%d",&n);
   printf("Factorial of %d is: %d",n,fact(n));
}
```

OUTPUT: