VISVESVARAYA TECHNOLOGICAL UNIVERSITY

"JnanaSangama", Belgaum -590014, Karnataka.

C PROGRAMMING LAB RECORD

Submitted by

ASHISH.C.HARAKUNI (1BM20CS025)

Under the Guidance of

Lohit J.J

Assistant Professor,

Department of CSE,

BMSCE

in partial fulfillment for the award of the degree of

BACHELOR OF ENGINEERING

in

COMPUTER SCIENCE AND ENGINEERING

B.M.S. COLLEGE OF ENGINEERING

(Autonomous Institution under VTU)

BENGALURU-560019

April-2021 to June-2021

B.M.S. COLLEGE OF ENGINEERING

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

DECALARATION

I **Ashish Harakuni** , student of 2nd Semester, B.E, Department of Computer Science and Engineering, B. M. S. College of Engineering, Bangalore, hereby declare that, this laboratory work for "C Programming" course has been carried out by us under the guidance of **Prof. Lohit.J.J** Assistant Professor, Department of CSE, B. M. S. College of Engineering, Bangalore during the academic semester April-2021-June-2021

We also declare that to the best of our knowledge and belief, the developed report here is not from part of any other report by any other students.

ASHISH.C.HARAKUNI (1BM20CS025)

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19.Demonstrate reading a 2-dimensional array of marks which stores marks of 4 students in 3 subjects and display the highest marks in each subject.

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21.Implement a c program to concatenate two strings and find the length of the resultant string without using built in functions.

22.Develop a C program to copy one string from to another string and find the length of the copied string.

23.Develop a C program to check whether the given string is palindrome or not.

24.Develop a c program to create student structure, read two students details and print the student details who has scored the highest.

25.Develop a C program to perform arithmetic operations on two integers using pointers concept.

26.Develop a C program to read and print three book details (i.e. Book title ,Author,Price, number of pages, date of publication). Also print the book details with highest price.

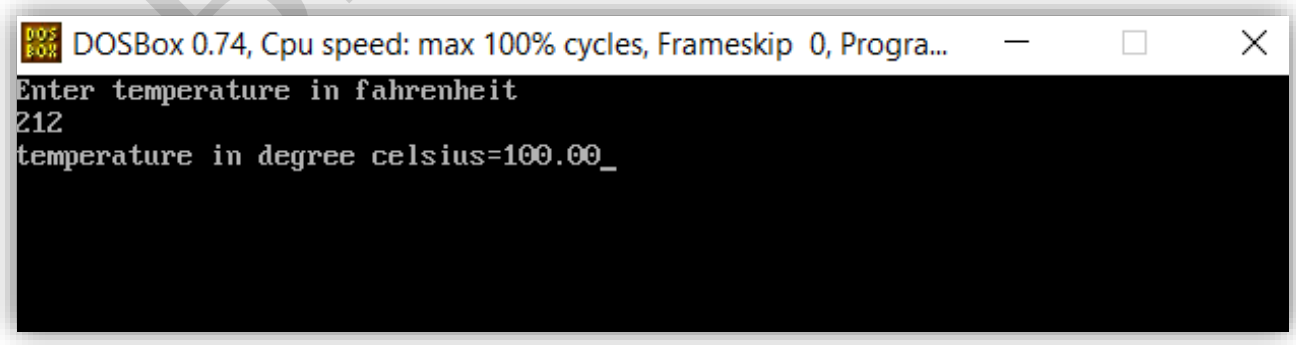
27.Illustrate swapping into pointers.

28.Demonstrate how to read data from the keyboard,write it to a file called BMSCE, again read data from BMSCE file, and display it on the screen/console.

1.Develop a C program to convert degrees Fahrenheit into degrees Celsius.

```
#include<stdio.h>
#include<conio.h>
void main()
{
  float faren,deg;
  clrscr();
  printf("Enter temperature in farenheit\n");
  scanf("%f",&faren);
  deg=(faren-32.0)*5/9;
  printf("temperature in degree celsius=%.2f",deg);
  getch();
}
```

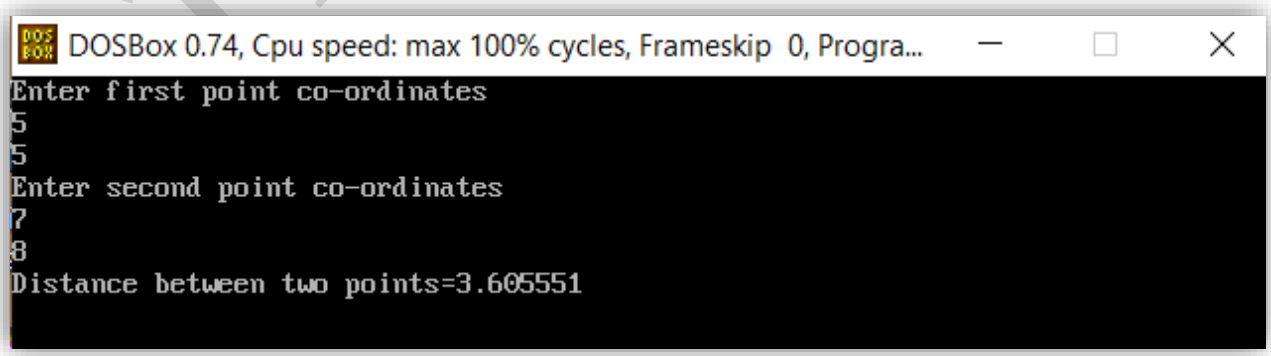
OUTPUT:



2.Implement a C program to find distance between two points.

```
//program to find distance between to points.
#include<stdio.h>
#include<conio.h>
#include<math.h>
void main()
{
 float x1,y1,x2,y2,dist;
 clrscr();
 printf("Enter first point co-ordinates\n");
 scanf("%f%f",&x1,&y1);
 printf("Enter second point co-ordinates\n");
 scanf("%f%f",&x2,&y2);
 dist=sqrt(pow(x2-x1,2)+pow(y2-y1,2));
 printf("Distance between two points=%f",dist);
 getch();
}
```

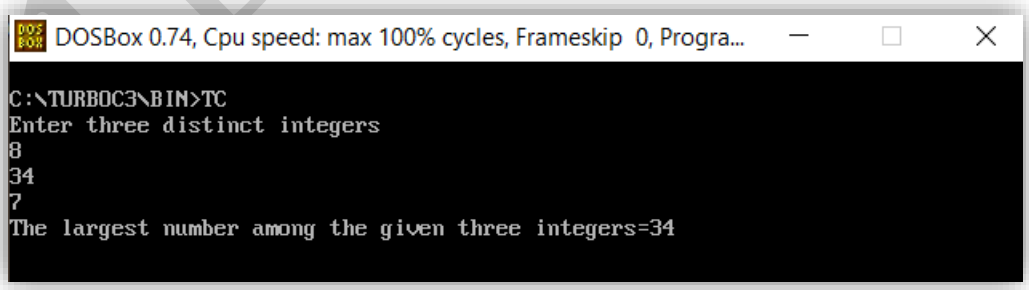
OUTPUT:



3.Develop a C program to find largest among the given 3 integers.

```
#include<stdio.h>
#include<conio.h>
int large(int,int,int);
void main()
{
  int a,b,c;
  printf("Enter three distinct integers\n");
  scanf("%d%d%d",&a,&b,&c);
  printf("The largest number among the given three integers=%d",large(a,b,c));
  getch();
}
int large(int a,int b,int c)
{
   int lar;
   lar=a>b?(a>c?a:c):(b>c?b:c);
   return lar;
}
```

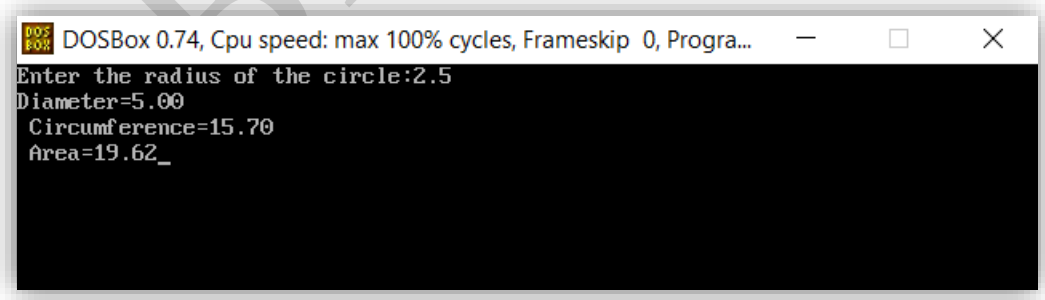
OUTPUT:



4.Develop a C program to calculate diameter, circumference, area of the circle if radius is given.

```
 #include<stdio.h>
#include<conio.h>
#define pi 3.14
void main()
{ float ra,dia,circum,area;
  printf("Enter the radius of the circle:");
  scanf("%f",&ra);

  dia=(2*ra);
  circum=(2*pi*ra);
  area=(pi*ra*ra);
  printf("Diameter=%.2f\n Circumference=%.2f\n Area=%.2f",dia,circum,area);
  getch();
}
```

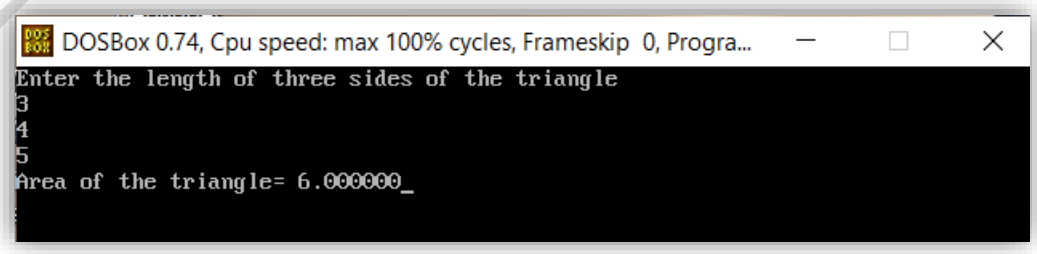
OUTPUT:



5.Develop a C program to find area of a triangle given its sides as input using functions.

```
//Area of triangle using its sides lengths(using user defined functions)
#include<stdio.h>
#include<conio.h>
#include<math.h>
float area(float,float,float);    //func declaration
void main()
{
   float a,b,c,ar;
   clrscr();
   printf("Enter the length of three sides of the triangle\n");
   scanf("%f%f%f",&a,&b,&c);
   ar=area(a,b,c);     //func call
   printf("Area of the triangle= %f",ar);
   getch();
}
float area(float a,float b,float c)   //func defn
{  float s,area;
  s=(a+b+c)/2.0;
  area=sqrt(s*(s-a)*(s-b)*(s-c));
  return area;
}
```

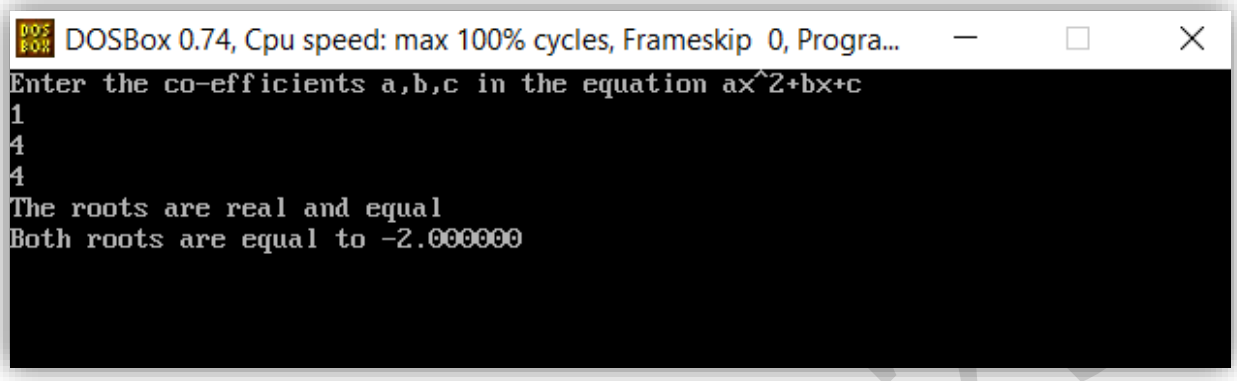
OUTPUT:



6.Develop a C program to find all possible roots of a quadratic equation.

```
#include<stdio.h>
#include<conio.h>
#include<math.h>
void main()
{
  float a,b,c,x1,x2,x,d,rp,ip;
  clrscr();
  printf("Enter the co-efficients a,b,c in the equation ax^2+bx+c\n");
  scanf("%f%f%f",&a,&b,&c);
  d=(b*b)-4*a*c;
  if(d>0)
  {  printf("Roots are real and distinct\n");
     x1=(-b+sqrt(d))/2*a;
     x2=(-b-sqrt(d))/2*a;
     printf("The roots of the equation are x1=%f and x2=%f\n",x1,x2);
  }
  else if(d==0)
  {   printf("The roots are real and equal\n");
      x=(-b)/2*a;
      printf("Both roots are equal to %f",x);
  }
  else
  { printf("The roots are imaginary and distinct\n");
    rp=(-b)/2*a;
    ip=sqrt(-d)/2*a;
    printf("the roots are %f+%fi and %f-%fi",rp,ip,rp,ip);
  }
  getch();
}
```

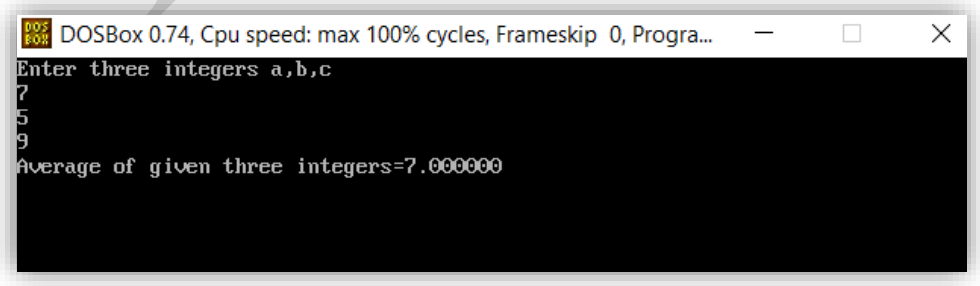
OUTPUT:



7.Develop a C program to calculate average of three integers using functions.

```
//program to find average of three integers
#include<stdio.h>
#include<conio.h>
int avg(int a,int b,int c);  //func declaration
void main()
{
  int a,b,c;
  float avr;
  clrscr();
  printf("Enter three integers a,b,c\n");
  scanf("%d%d%d",&a,&b,&c);
  avr=avg(a,b,c);       //func call
  printf("Average of given three integers=%f",avr);
  getch();
}

int avg(int a,int b,int c)    //func defn
{
 return ((a+b+c)/3.0);
}
```

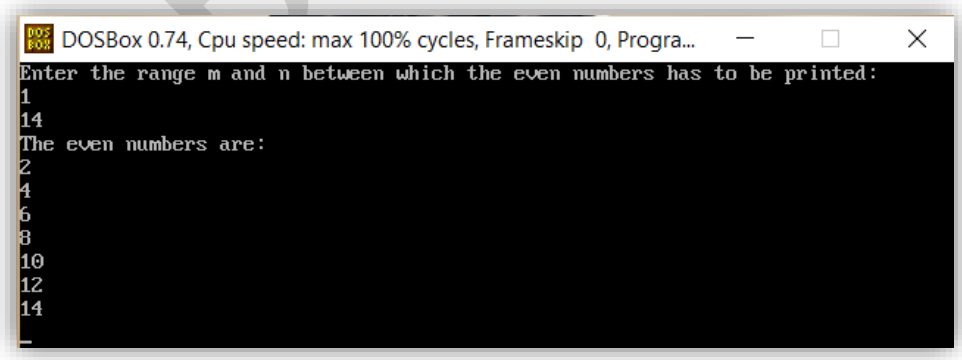
OUTPUT:



8.Develop a C program to print all even numbers between m and n range.

```
#include<stdio.h>
#include<conio.h>
void main()
{  int m,n,i;
  printf("Enter the range m and n between which the even numbers has to be printed:\n");
  scanf("%d %d",&m,&n);
  printf("The even numbers are:\n");
  for(i=m;i<=n;i++)
  {  if(i%2==0)
        printf("%d\n",i);
    else
        continue;
  }
  getch();
 }
```

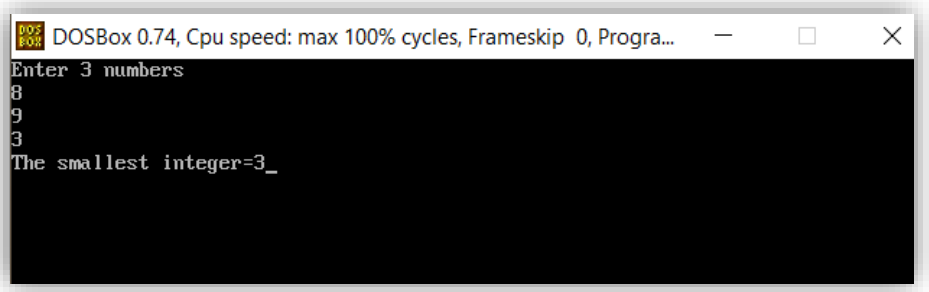
OUTPUT:



9.Ilustrate conditional branching statements to find the smallest of three numbers.

```
#include<stdio.h>
#include<conio.h>
int small(int,int,int);
void main()
{
  int a,b,c;
  clrscr();
  printf("Enter 3 numbers\n");
  scanf("%d%d%d",&a,&b,&c);// Enter only integers
  if(a==b && b==c && c==a)
   printf("all are equal");
  else
   printf("The smallest integer=%d",small(a,b,c));
  getch();
}
int small(int a,int b,int c)
{
   if(a<=b && a<=c)
          return a;
   else if(b<=a && b<=c)
          return b;
   else
         return c;
}
```

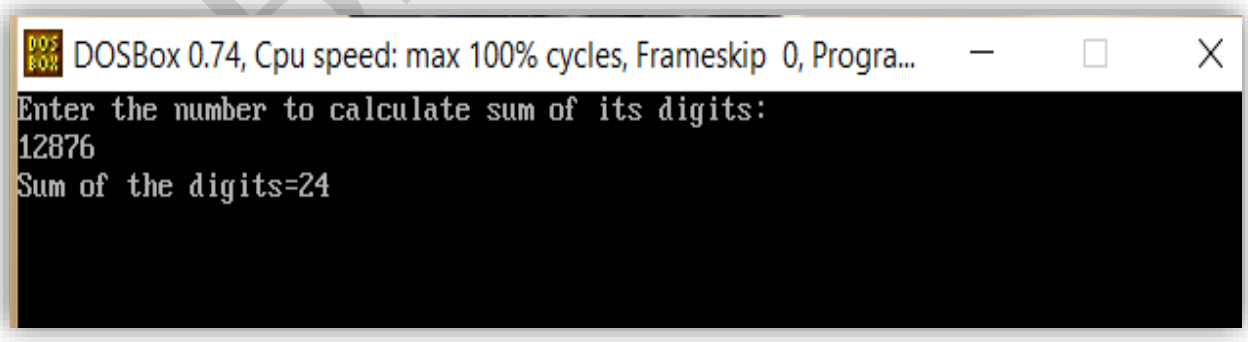
OUTPUT:



10.Develop a C program to calculate the sum of the digits of the given number.

```
#include<stdio.h>
#include<conio.h>
void main()
{ int num,re,sum=0;
  printf("Enter the number to calculate sum of its digits:\n");
  scanf("%d",&num);
  while(num>0)
  {  re=num%10;
     sum+=re;
     num=num/10;
  }
  printf("Sum of the digits=%d",sum);
  getch();
}
```

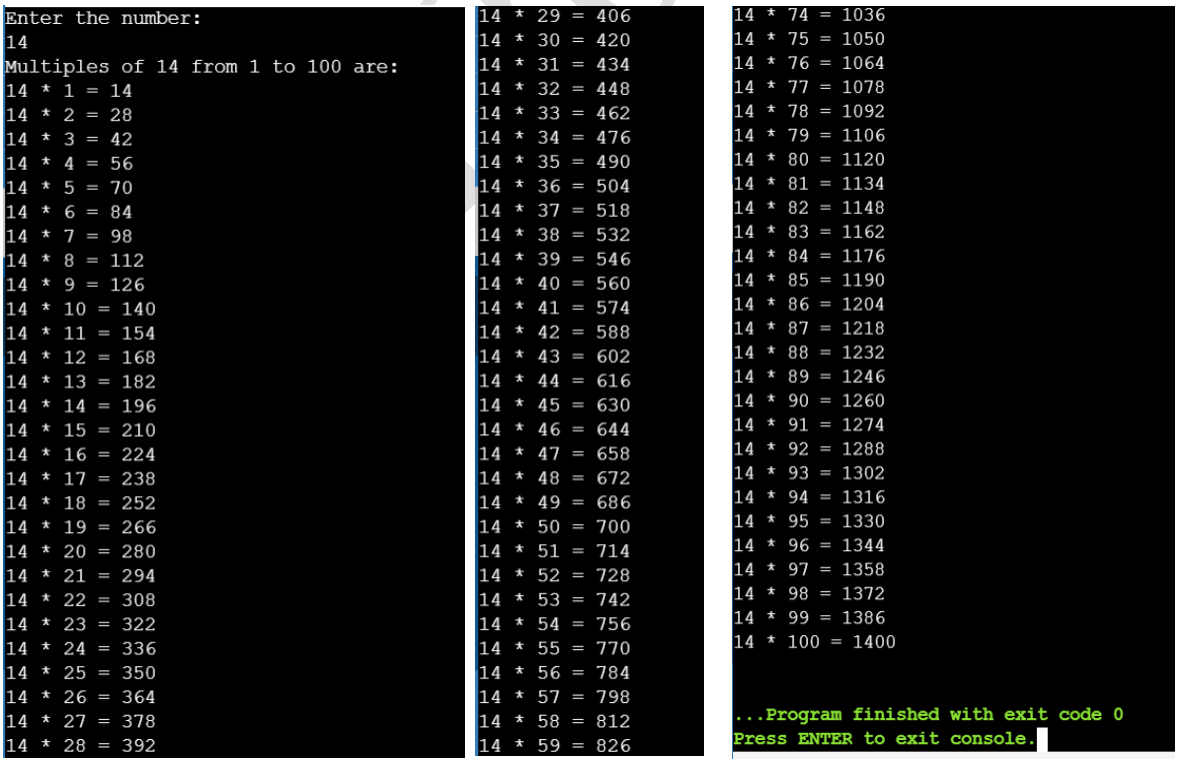
OUTPUT:



11.Develop a C program to print the multiples of n from 1 to 100.

```
#include<stdio.h>
#include<conio.h>
void main()
{  int n,i;
   printf("Enter the number:\n");
   scanf("%d",&n);
   printf("Multiples of %d from 1 to 100 are:\n",n);
   for(i=1;i<=100;i++)
   {  printf("%d * %d = %d\n",n,i,(n*i));
   }
   getch();
}
```

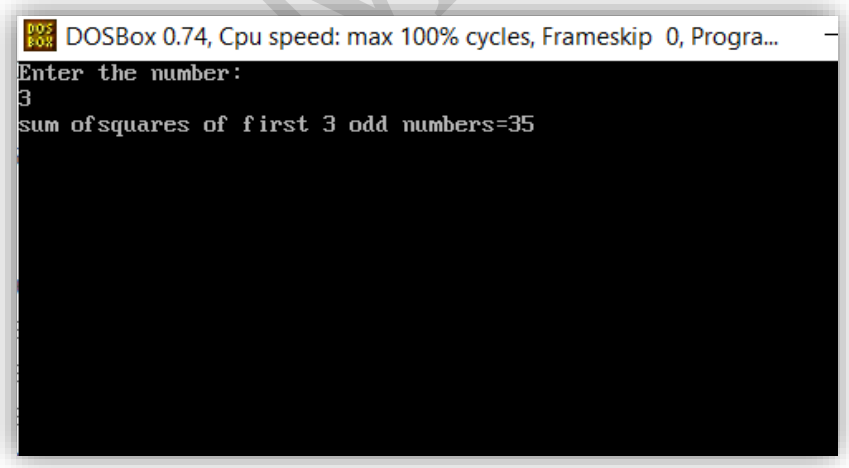
OUTPUT:



12.Develop a C program to calculate the sum of the squares of the first n odd numbers.

```
#include<stdio.h>
#include<conio.h>
void main()
{ int n,i,sum=0;
  printf("Enter the number upto which the sum of squares of odd numbers has to be calculated:\n");
  scanf("%d",&n);
  for(i=1;i<(2*n);i+=2)
  { sum=sum+(i*i);
  }
  printf("sum ofsquares of first %d odd numbers=%d",n,sum);
  getch();
}
```

OUTPUT:

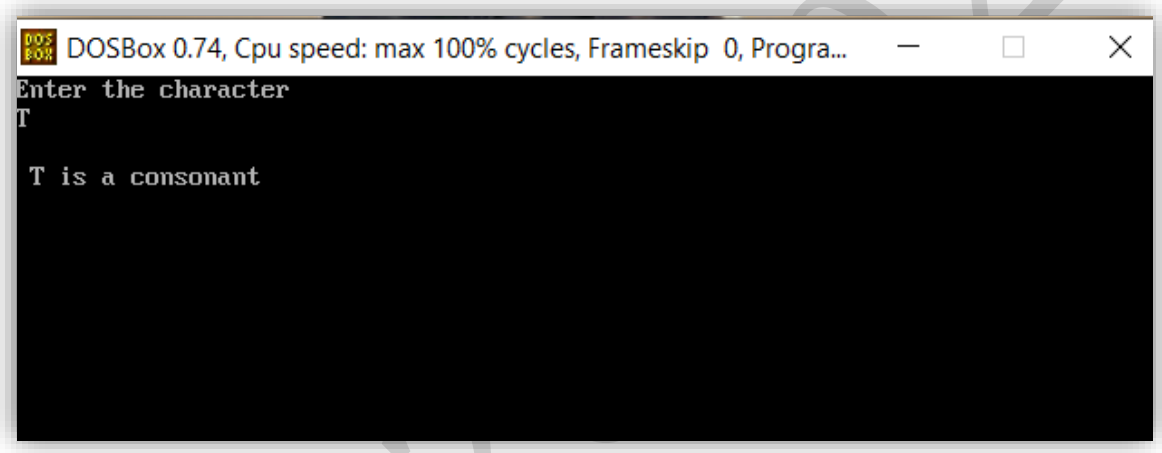


13.Develop a C program to determine whether the entered character is vowel or consonant using switch case.

```
#include<stdio.h>
#include<conio.h>
int vowel_check(char);
void main()
{
  char ch;
  clrscr();
  printf("Enter the character\n");
  scanf("%c",&ch);
  printf(" %c",vowel_check(ch));
  getch();
}
int vowel_check(char ch)
{
 switch(ch)
  {
     case'A':
     case'a':
     case'E':
     case'e':
     case'I':
     case'i':
     case'O':
     case'o':
     case'U':
     case'u':
          printf(" \n %c is vowel",ch);
          break;
     default:  printf("\n %c is a consonant",ch);
```

```
return 0;
    }

}
```

OUTPUT:

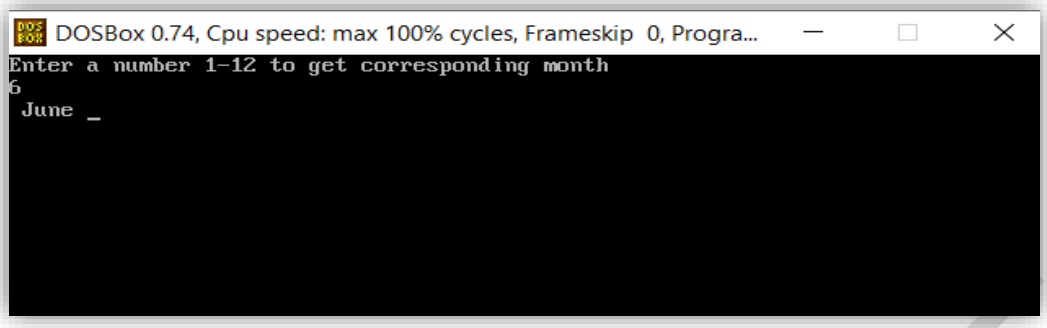


14.Develop a C program to print the corresponding month if number is given as input using switch case statement.

```
#include<stdio.h>
#include<conio.h>
void main()
{
 int n;
 clrscr();
 printf("Enter a number 1-12 to get corresponding month\n");
 scanf("%d",&n);
 printf("%c",month(n));
 getch();
}
int month(int n)
{
  switch(n)
 {
   case 1:
   {  printf(" January");}
     break;
   case 2:
     printf(" February");
     break;
   case 3:
     printf(" March");
     break;
   case 4:
     printf(" April");
     break;
   case 5:
     printf(" may");
```

```
      break;
    case 6:
      printf(" June");
      break;
case 7:
      printf(" July");
      break;
    case 8:
      printf(" August");
      break;
    case 9:
      printf(" September");
      break;
    case 10:
      printf(" October");
      break;
    case 11:
      printf(" November");
      break;
    case 12:
      printf(" December");
      break;
    default:
      printf("wrong input");
    }
    return 0;
    getch();
}
```

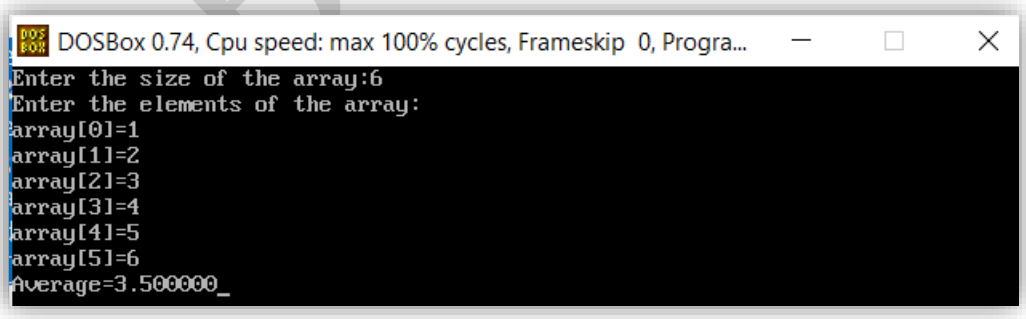
OUTPUT:


DOSBox 0.74, Cpu speed: max 100% cycles, Frameskip 0, Progra...
Enter a number 1-12 to get corresponding month
6
June _

15.Develop a C program to calculate average of elements given in an array.

```
#include<stdio.h>
#include<conio.h>
void main()
{  int n,i,arr[30],sum=0;
   float avg;
   printf("Enter the size of the array:");
   scanf("%d",&n);
   printf("Enter the elements of the array:\n");
   for(i=0;i<n;i++)
   {  printf("array[%d]=",i);
      scanf("%d",&arr[i]);
      sum+=arr[i];
   }
   avg=(float) sum/n;
   printf("Average=%f",avg);
   getch();
}
```

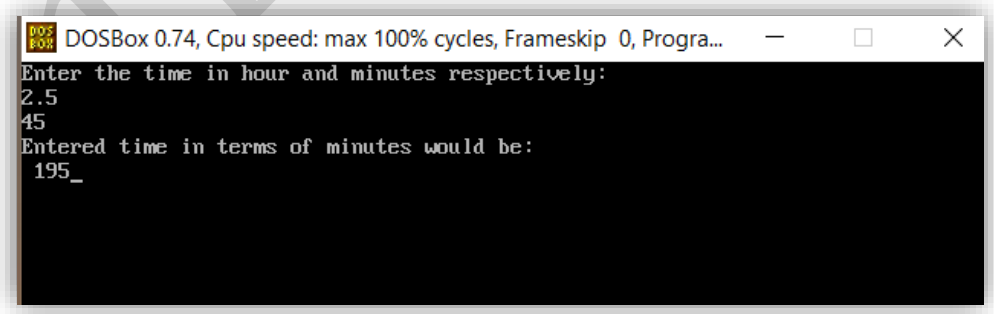
OUTPUT:



16.Develop a C program to calculate total time in minutes if hours and minutes are given as input.

```
#include<stdio.h>
#include<conio.h>
int time(float,int);
void main()
{ int min;
  float hr;
  clrscr();
  printf("Enter the time in hour and minutes respectively:\n");
  scanf("%f %d",&hr,&min);
  printf("Entered time in terms of minutes would be:\n %d",time(hr,min));
  getch();
}
int time(float hr,int min)
{  int total_mins;
   total_mins=(hr*60)+min;
   return total_mins;
}
```

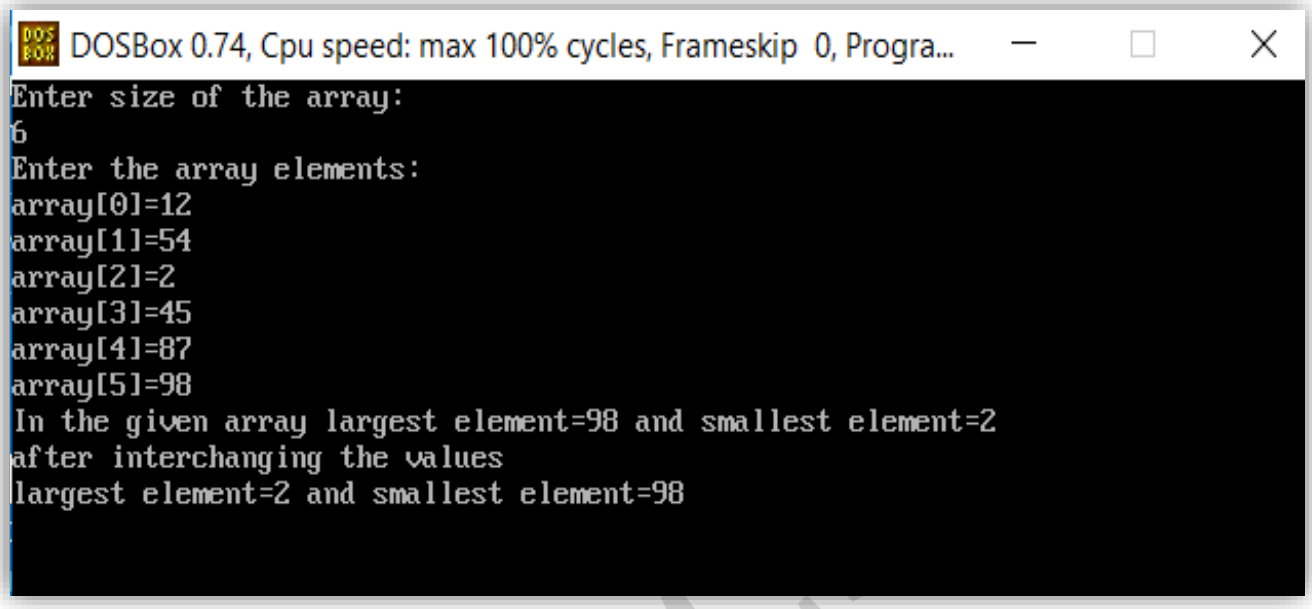
OUTPUT:



17.Program to interchange the largest and smallest element in the given array.

```
#include<stdio.h>
#include<conio.h>
void main()
{  int arr[30],i,max,min,n,temp;
   printf("Enter size of the array:\n");
   scanf("%d",&n);
   printf("Enter the array elements:\n");
   for(i=0;i<n;i++)
   {  printf("array[%d]=",i);
      scanf("%d",&arr[i]);
   }
   max=arr[0];
   min=arr[0];
   for(i=0;i<n;i++)
   {  if(max<arr[i])
         max=arr[i];
      if(min>arr[i])
         min=arr[i];
   }
   printf("In the given array largest element=%d and smallest element=%d\n
after interchanging the values",max,min);
   temp=max;
   max=min;
   min=temp;
   printf("\nlargest element=%d and smallest element=%d",max,min);
   getch();
}
```

OUTPUT:

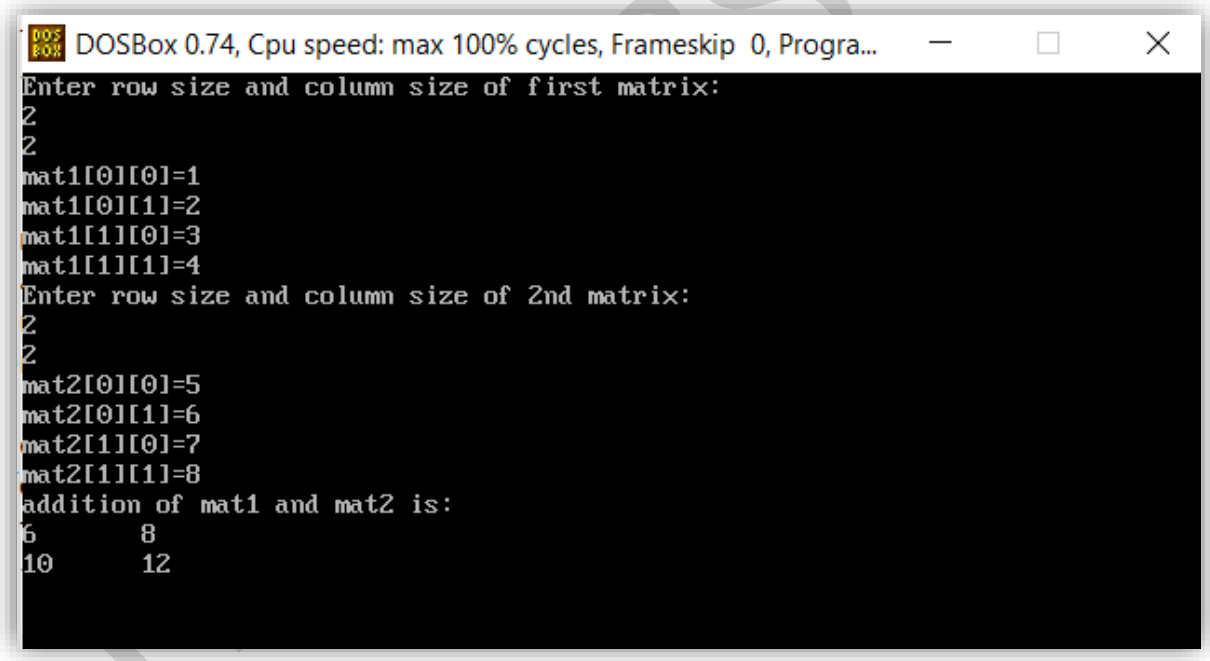


18.Develop a C program to perform addition of two matrices.

```
// addition of two matrices
#include<stdio.h>
#include<conio.h>
void main()
{  int i,j,mat1[20][20],mat2[20][20],r1,r2,c1,c2,rs,cs,sum[20][20];
   clrscr();
   printf("Enter row size and column size of first matrix:\n");
   scanf("%d %d",&r1,&c1);
   for(i=0;i<r1;i++)
   { for(j=0;j<c1;j++)
     { printf("mat1[%d][%d]=",i,j);
       scanf("%d",&mat1[i][j]);
     }
  }
  printf("Enter row size and column size of 2nd matrix:\n");
   scanf("%d %d",&r2,&c2);
  if(r1!=r2 || c1!=c2)
  { printf("for matrix addition row and column sizes of matrixes should be same
\n please enter valid one");
  }
  else
  { for(i=0;i<r2;i++)
   { for(j=0;j<c2;j++)
     { printf("mat2[%d][%d]=",i,j);
       scanf("%d",&mat2[i][j]);
     }
   } printf("addition of mat1 and mat2 is:\n");
   rs=r1;
   cs=c1;
```

```
  for(i=0;i<rs;i++)
  { for(j=0;j<cs;j++)
    { sum[i][j]=mat1[i][j]+mat2[i][j];
      printf("%d \t",sum[i][j]);
    }printf("\n");
  }
 }
 getch();
}
```

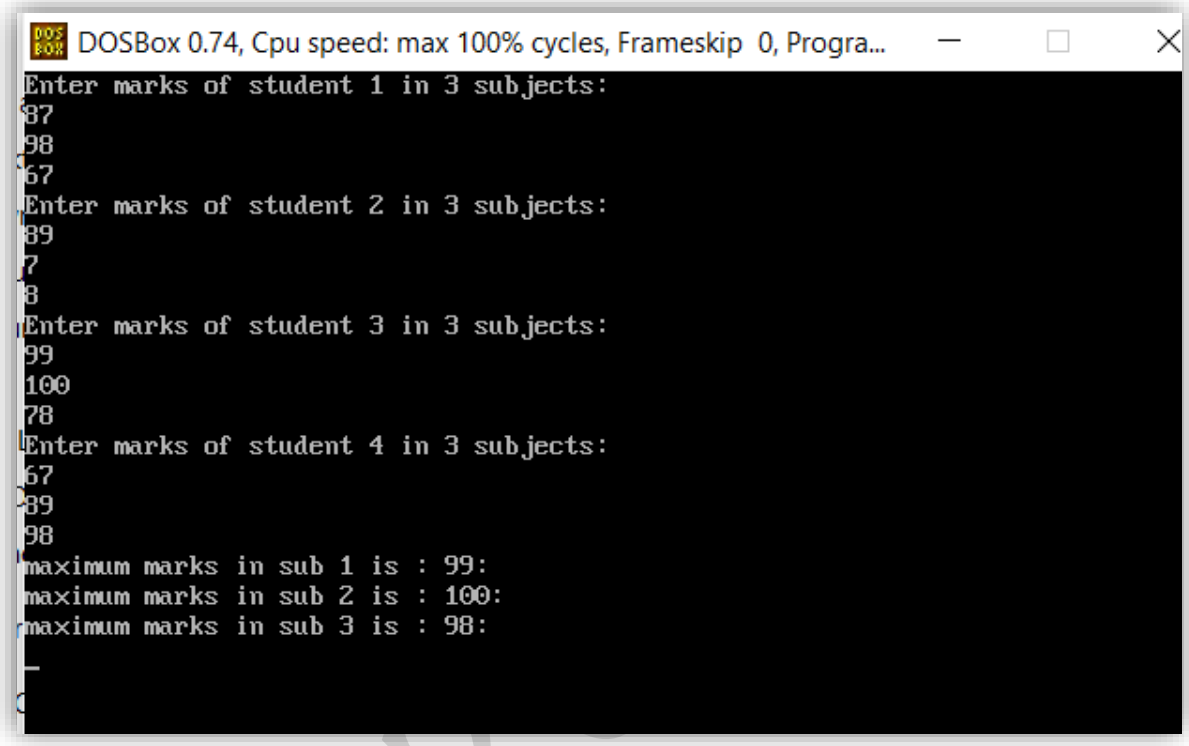
OUTPUT:



19.Demonstrate reading a 2-dimensional array of marks which stores marks of 4 students in 3 subjects and display the highest marks in each subject.

```
#include<stdio.h>
#include<conio.h>
void main()
{
  int i,j,max,a[4][3];
  clrscr();
  for(i=0;i<4;i++)
  { printf("Enter marks of student %d in 3 subjects:",i+1);
   for(j=0;j<3;j++)
   {
        scanf("%d",&a[i][j]);
   }
  }
  for(j=0;j<3;j++)
  { max=a[0][j];
   for(i=0;i<4;i++)
   {  if(a[i][j]>max)
        { max=a[i][j];
        }
   }
   printf("maximum marks in sub %d is : %d:\n",j+1,max);
  }
  getch();
}
```

OUTPUT:

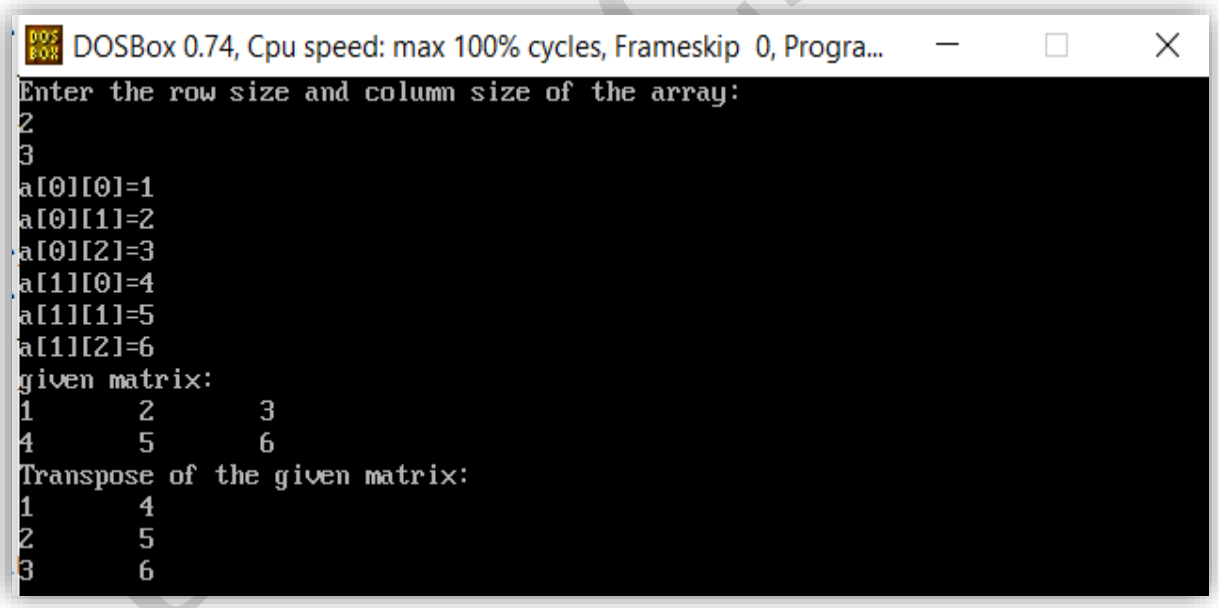

DOSBox 0.74, Cpu speed: max 100% cycles, Frameskip 0, Progra...
Enter marks of student 1 in 3 subjects:
87
98
67
Enter marks of student 2 in 3 subjects:
89
7
8
Enter marks of student 3 in 3 subjects:
99
100
78
Enter marks of student 4 in 3 subjects:
67
89
98
maximum marks in sub 1 is : 99:
maximum marks in sub 2 is : 100:
maximum marks in sub 3 is : 98:

20.Develop a C program to print transpose of a matrix.

```
//program to print transpose of a matrix

#include<stdio.h>
#include<conio.h>
void main()
{ int i,j,a[20][20],t[20][20],row,col;
  clrscr();
  printf("Enter the row size and column size of the array:");
 scanf("%d%d",&row,&col);
  for(i=0;i<row;i++)
  {  for(j=0;j<col;j++)
    { printf("a[%d][%d]=",i,j);
      scanf("%d",&a[i][j]);
    }
  }printf("given matrix:\n");
  for(i=0;i<row;i++)
  {  for(j=0;j<col;j++)
    { printf("%d \t",a[i][j]);

    }printf("\n");
  }
  printf("Transpose of the given matrix:\n");
  for(i=0;i<row;i++)
  {  for(j=0;j<col;j++)
    { t[j][i]=a[i][j];

    }
  }
```

```
for(i=0;i<col;i++)
{  for(j=0;j<row;j++)
  { printf("%d \t",t[i][j]);

  }
  printf("\n");
}
getch();
}
```

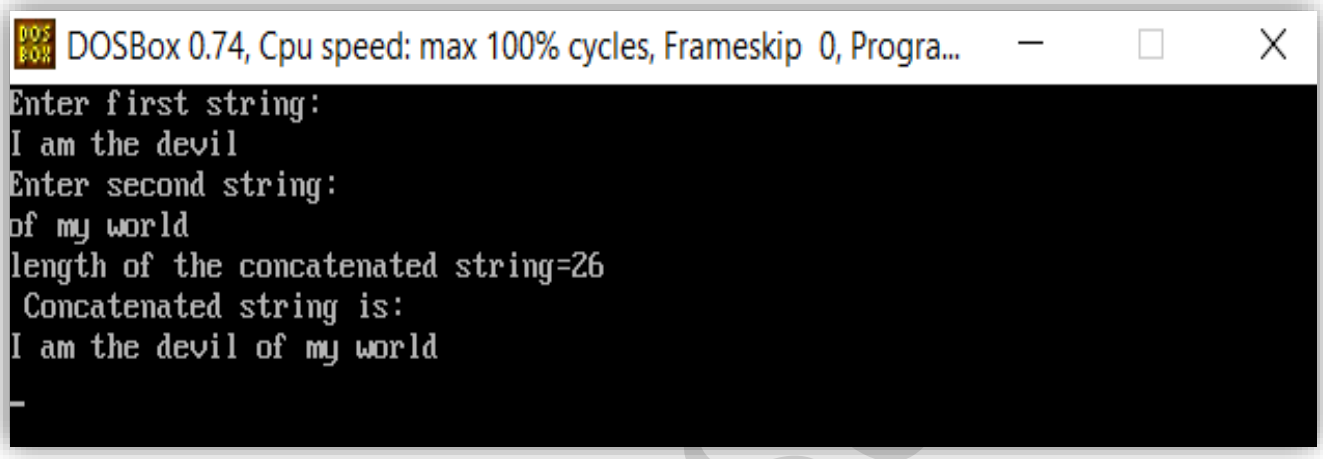
OUTPUT:



21.Implement a c program to concatenate two strings and find the length of the resultant string without using built in functions.

```
#include<stdio.h>
#include<conio.h>
void main()
{  char str1[50],str2[50],str3[100];
   int i=0,j=0;
   clrscr();
   printf("Enter first string:\n");
   gets(str1);
   printf("Enter second string:\n");
   gets(str2);
   while(str1[i]!='\0')
   {  str3[j]=str1[i];
      i++;
      j++;
      }
   i=0;
   while(str2[i]!='\0')
   {  str3[j]=str2[i];
      i++;
      j++;}
   str3[j]='\0';

   printf("length of the concatenated string=%d\n Concatenated string is:\n",j);
   puts(str3);
   getch();
}
```

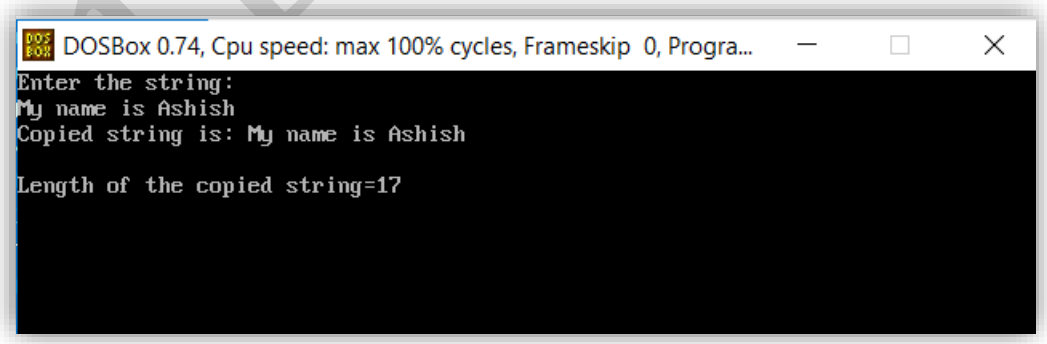
OUTPUT:



22.Develop a C program to copy one string from to another string and find the length of the copied string.

```
#include<stdio.h>
#include<conio.h>
void main()
{  char str[50],costr[50],i,j=0;
   clrscr();
   printf("Enter the string:\n");
   gets(str);
   for(i=0;str[i]!='\0';i++)
   {  costr[j]=str[i];
      j++;
   }
   costr[j]='\0';
   printf("Copied string is: %s\n",costr);

   printf("\nLength of the copied string=%d",j);
   getch();
}
```

OUTPUT:

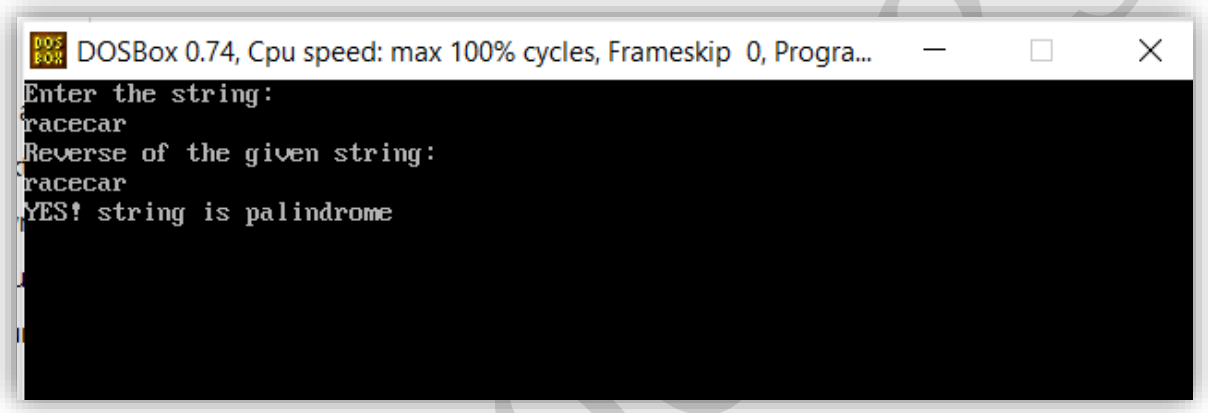


23.Develop a C program to check whether the given string is palindrome or not.

```
#include<stdio.h>
#include<string.h>
#include<conio.h>
void main()
{
 char str[50],revstr[50];
 int n,i=0,flag=1;
 clrscr();
 printf("Enter the string:\n");
 gets(str);
 n=strlen(str)-1;
 while(str[i]!='\0')
 { revstr[i]=str[n];
  i++;
  n--;}
 revstr[i]='\0';
 printf("Reverse of the given string:\n");
 puts(revstr);

 n=strlen(str)-1;
 for(i=0;i<=n;i++)
 { if(str[i]!=revstr[i])
  {  flag=0;
     break;
  }
}
if(flag)
{printf("palindrome");}
else
 {printf("not a palindrome");}
```

```
 getch();
}
```

OUTPUT:

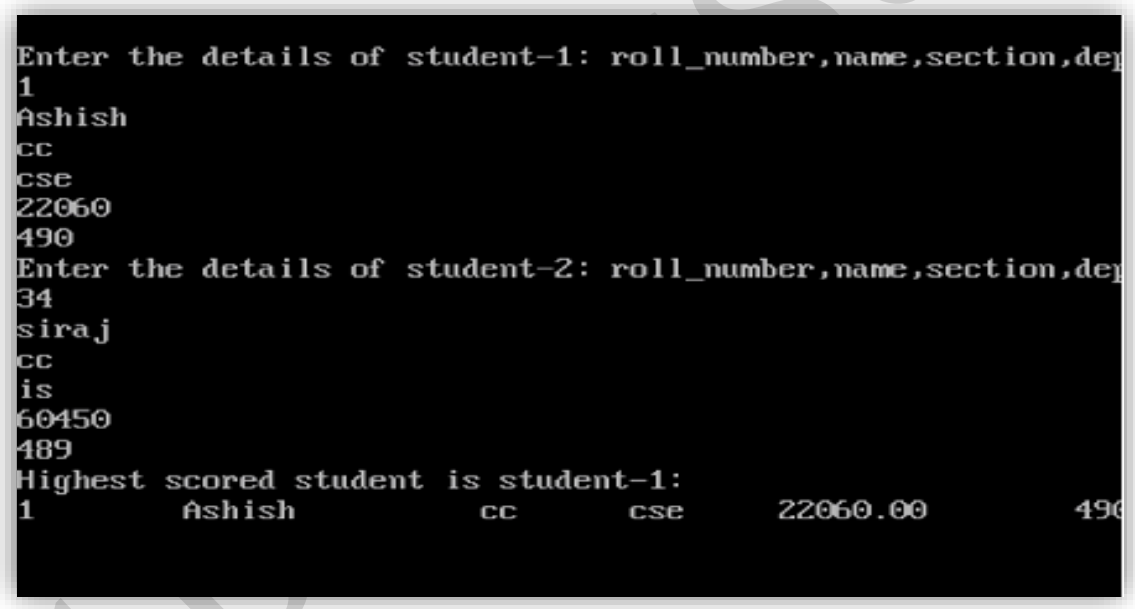


24.Develop a c program to create student structure, read two students details and print the student details who has scored the highest.

```
//enter details of std1 and std2 and print high scored student details
#include<stdio.h>
#include<conio.h>
void main()
{ struct student
  {int rollno;
  char name[20];
  char sec[20];
  char dep[20];
  float fees;
  int result;
  }std1,std2;
  clrscr();
  printf("Enter the details of student-1:
roll_number,name,section,dep,fees,result");
  scanf("%d %s %s %s %f
%d",&std1.rollno,std1.name,std1.sec,std1.dep,&std1.fees,&std1.result);
  printf("Enter the details of student-2:
roll_number,name,section,dep,fees,result");
  scanf("%d %s %s %s %f
%d",&std2.rollno,std2.name,std2.sec,std2.dep,&std2.fees,&std2.result);
  if(std1.result>std2.result)
  {  printf("Highest scored student is student-1:\n");
     printf("%d\t %s \t %s \t %s\t %.2f \t
%d",std1.rollno,std1.name,std1.sec,std1.dep,std1.fees,std1.result);
  }
```

```
  else
  { printf("Highest scored student is student-2:\n");
    printf("%d\t %s \t %s \t %s\t %.2f \t
%d",std2.rollno,std2.name,std2.sec,std2.dep,std2.fees,std2.result);
  }
  getch();
}
```

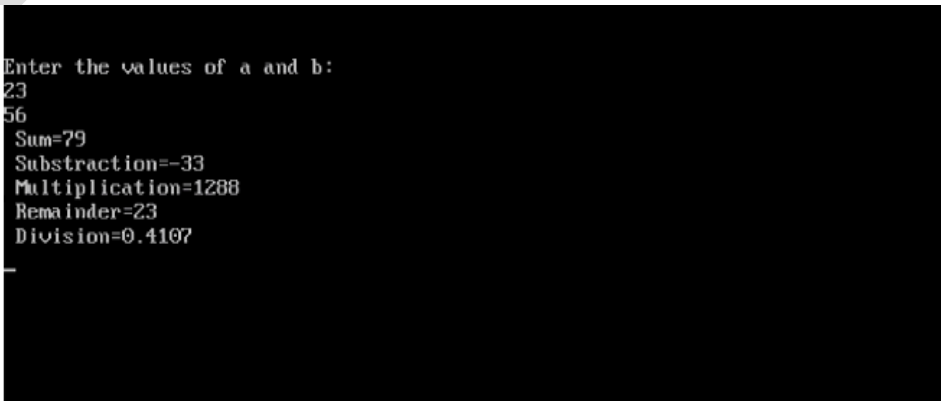
OUTPUT:



25.Develop a C program to perform arithmetic operations on two integers using pointers concept.

```
//maths operations on pointers
#include<stdio.h>
#include<conio.h>
void main()
{
  int a,b,*p,*q,sum,sub,mul,rem;
  float div;
  clrscr();
  printf("Enter the values of a and b:\n");
  scanf("%d  %d",&a,&b);
  p=&a;
  q=&b;
  //mathematical operations using pointers
  sum=(*p)+(*q);
  sub=(*p)-(*q);
  mul=(*p)*(*q);
  div=(float)*p/(*q);
  rem=(*p)%(*q);
  printf(" Sum=%d\n Substraction=%d\n Multiplication=%d\n Remainder=%d\n
Division=%.4f\n",sum,sub,mul,rem,div);
  getch();
 }
```

OUTPUT:

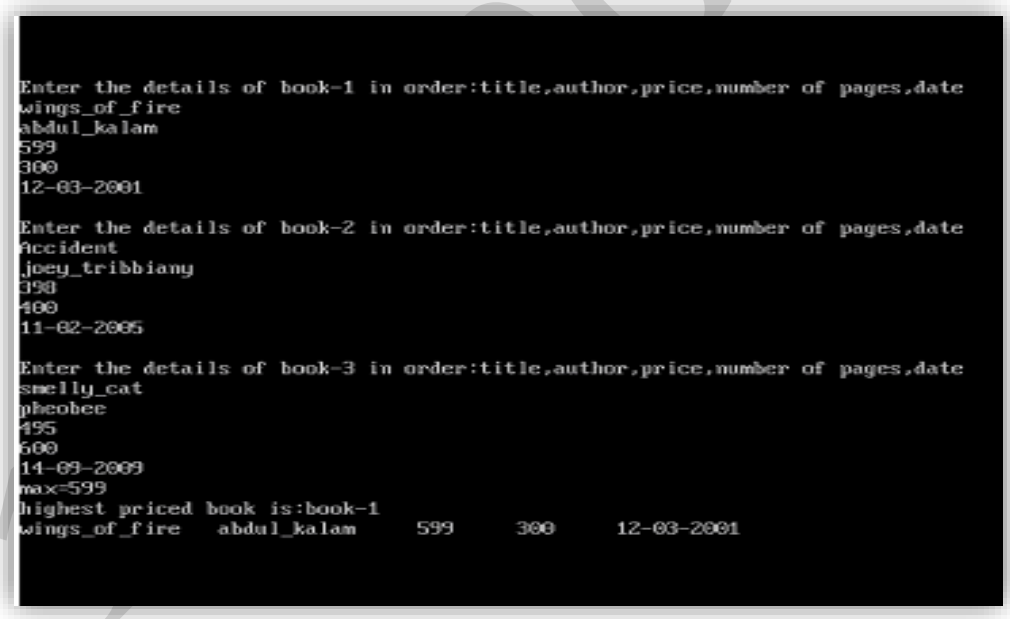


26.Develop a C program to read and print three book details (i.e. Book title ,Author,Price, number of pages, date of publication). Also print the book details with highest price.

```
#include<stdio.h>
#include<conio.h>
void main()
{ int max;
  struct book
  { char title[20];
    char author[20];
    int price;
    int pages;
    char date[20];
  }b1,b2,b3;
  clrscr();
  printf("\nEnter the details of book-1 in order:title,author,price,number of
pages,date \n");
  scanf("%s%s%d%d%s",b1.title,b1.author,&b1.price,&b1.pages,b1.date);
  printf("\nEnter the details of book-2 in order:title,author,price,number of
pages,date  \n");
  scanf("%s%s%d%d%s",b2.title,b2.author,&b2.price,&b2.pages,b2.date);
  printf("\nEnter the details of book-3 in order:title,author,price,number of
pages,date  \n");
  scanf("%s%s%d%d%s",b3.title,b3.author,&b3.price,&b3.pages,b3.date);

max=(b1.price>=b2.price)?(b1.price>=b3.price?b1.price:b3.price):(b2.price>=b3.
price?b2.price:b3.price);
  printf("max=%d",max);
  if(max==b1.price)
  { printf("\nhighest priced book is:book-1\n");
    printf("%s\t%s\t%d\t%d\t%s",b1.title,b1.author,b1.price,b1.pages,b1.date);
```

```
 }
 else if(max==b2.price)
 { printf("\nhighest priced book is:book-2\n");
  printf("%s\t%s\t%d\t%d\t%s",b2.title,b2.author,b2.price,b2.pages,b2.date);
 }
 else
 { printf("\nhighest priced book is:book-3\n");
  printf("%s\t%s\t%d\t%d\t%s",b3.title,b3.author,b3.price,b3.pages,b3.date);
 }

 getch();
}
```

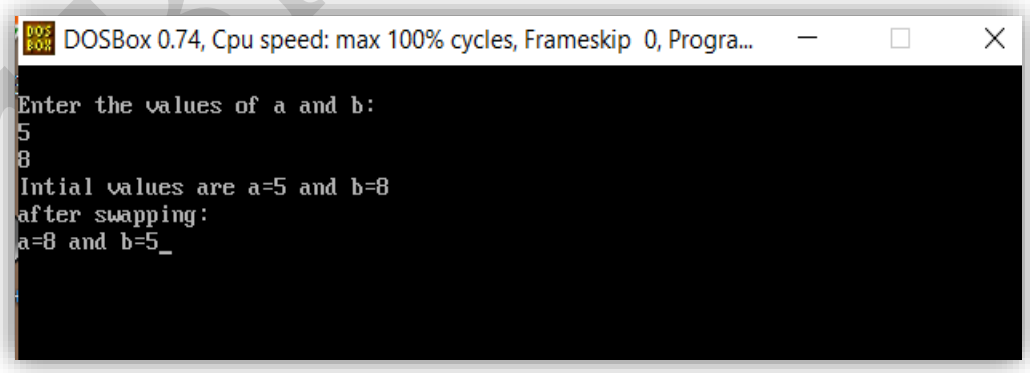
OUTPUT:



27.Illustrate swapping into pointers.

```
//swap using pointers
#include<stdio.h>
#include<conio.h>
void main()
{
  int a,b,*pa,*pb,temp;
  clrscr();
  printf("\nEnter the values of a and b:\n");
  scanf("%d %d",&a,&b);
  pa=&a;
  pb=&b;
  printf("Intial values are a=%d and b=%d\nafter swapping:\n",a,b);
  temp=*pa;
  *pa=*pb;
  *pb=temp;
  printf("a=%d and b=%d",a,b);
  getch();
}
```

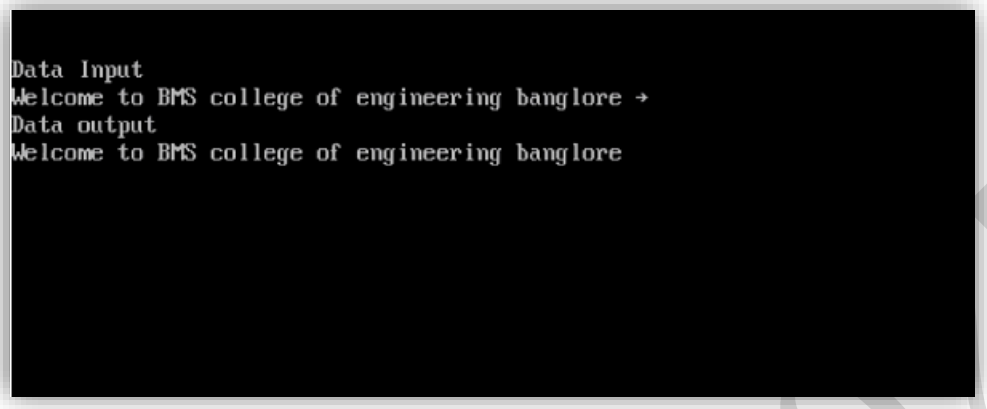
OUTPUT:

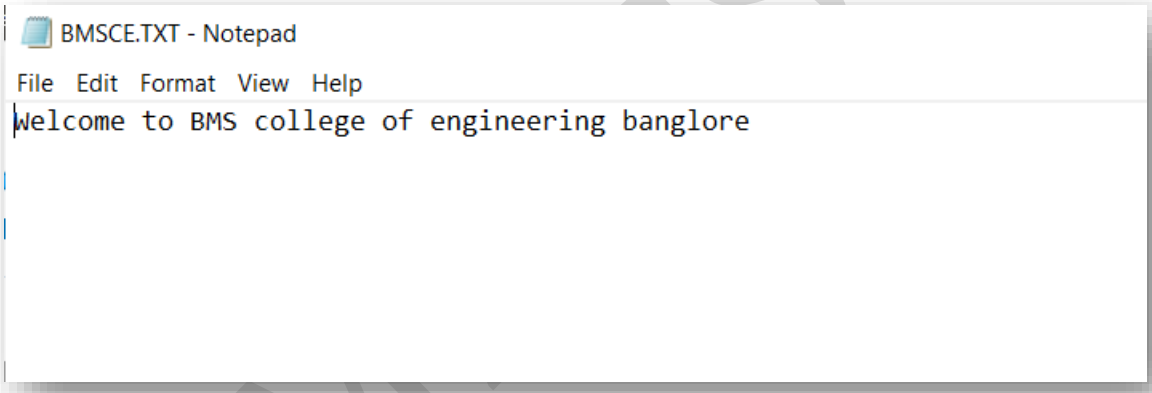


28.Demonstrate how to read data from the keyboard,write it to a file called BMSCE, again read data from BMSCE file, and display it on the screen/console.

```
#include<stdio.h>
#include<conio.h>
#include<stdlib.h>
void main()
{ FILE *fp;
  char c;
  char str[100];
  clrscr();
  printf("Data Input\n");
  fp=fopen("bmsce.txt","w");
  while((c=getchar())!=EOF)   //press ctrl+z to end the program
  { putc(c,fp);}
  fclose(fp);
  printf("Data output\n");
  fp=fopen("bmsce.txt","r");
  if(fp==NULL)
  { printf("ERROR");
    exit(1);
    }
  fgets(str,100,fp);
  puts(str);
  fclose(fp);
  getch();
}
```

OUTPUT:


Data Input
Welcome to BMS college of engineering banglore →
Data output
Welcome to BMS college of engineering banglore


BMSCE.TXT - Notepad
File Edit Format View Help
Welcome to BMS college of engineering banglore