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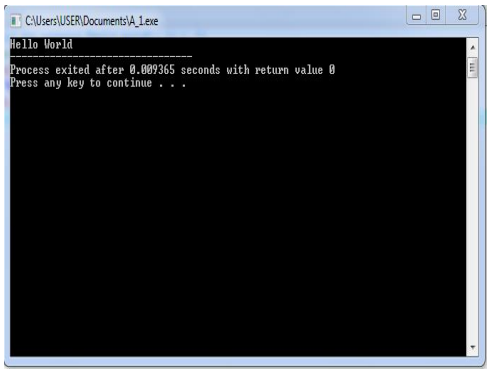
Dept. :CSE,Section:C

1st Semester Odd

/*1) Print the sentence “Hello world” - in c. */

```
#include<stdio.h>

int main(){

printf("Hello World");

return 0;}
```

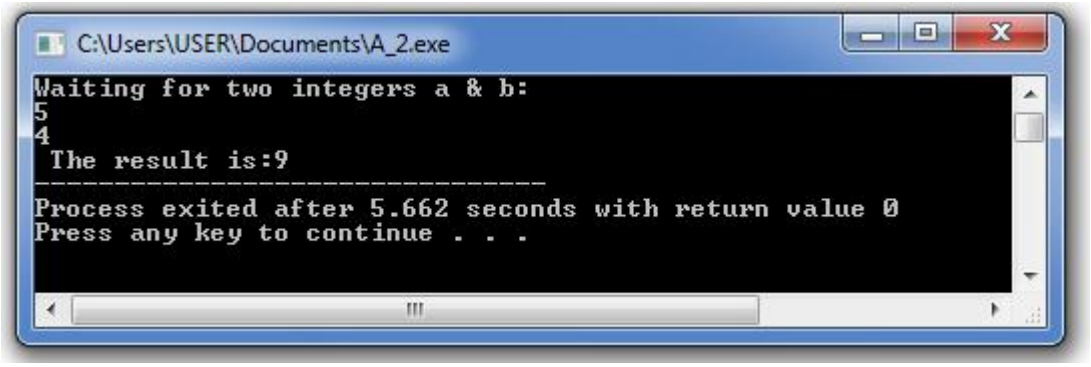


/*2) Take two int from user and print their sum */

```
#include<stdio.h>

int main() {

int a,b,c;

printf("Waiting for two integers a & b:\n");

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

c=a+b;

printf(" The result is:%d",c);
```

return 0;

}



/*3) Take two float from user and print their subtraction*/

#include<stdio.h>

int main() {

float a,b,c;

printf("Waiting for two floats a & b:\n");

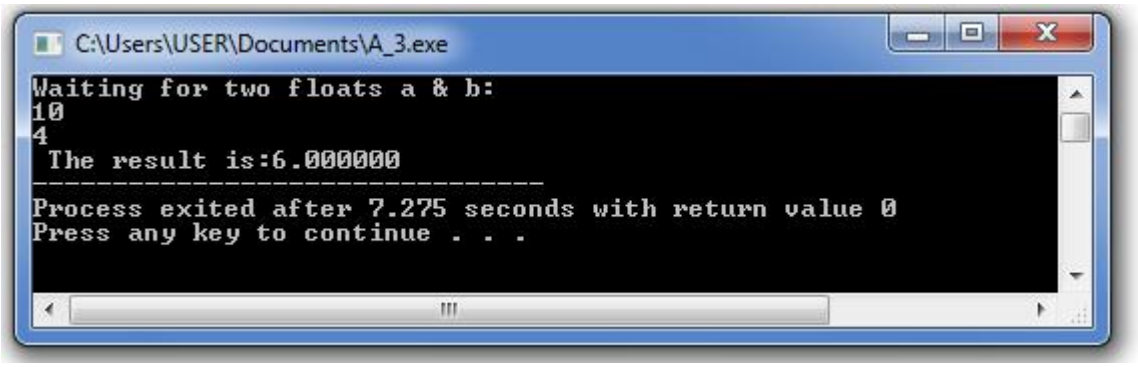
scanf("%f %f",&a,&b);

c=a-b;

printf(" The result is:%f",c);

return 0;

}



/*4) Take two float number as input from user and print their average */

#include<stdio.h>

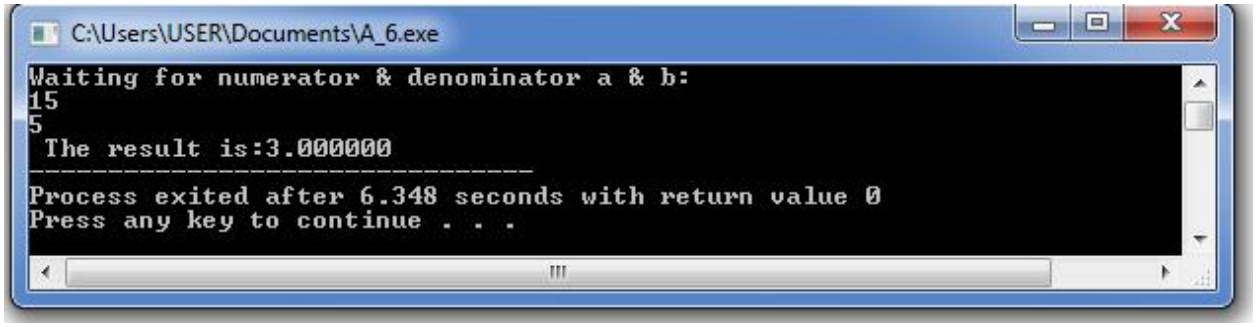
int main() {

```
float a,b,c;

printf("Waiting for two floats a & b:\n");

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

c=(a+b)/2.0;

printf(" The result is:%f",c);

return 0;

}
```


```
/*5) Take two double number as input from user and print their multiplication.*/

#include<stdio.h>

int main() {

double a,b,c;

printf("Waiting for two doubles a & b:\n");

scanf("%lf %lf",&a,&b);

c=a*b;

printf(" The result is:%lf",c);

return 0;

}
```

/*6) Take two double number from user and print their division.*/

```
#include<stdio.h>

int main() {

double a,b,c;

printf("Waiting for numerator & denominator a & b:\n");

scanf("%lf %lf",&a,&b);

c=a/b;

printf(" The result is:%lf",c);

return 0;

}
```



/*(7)Take a,b,c as input from user and print resultant d where d = 2a + b^2 + c */

```
#include<stdio.h>

int main() {

int a,b,c,d;

printf("Waiting for three integers a , b & c:\n");

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

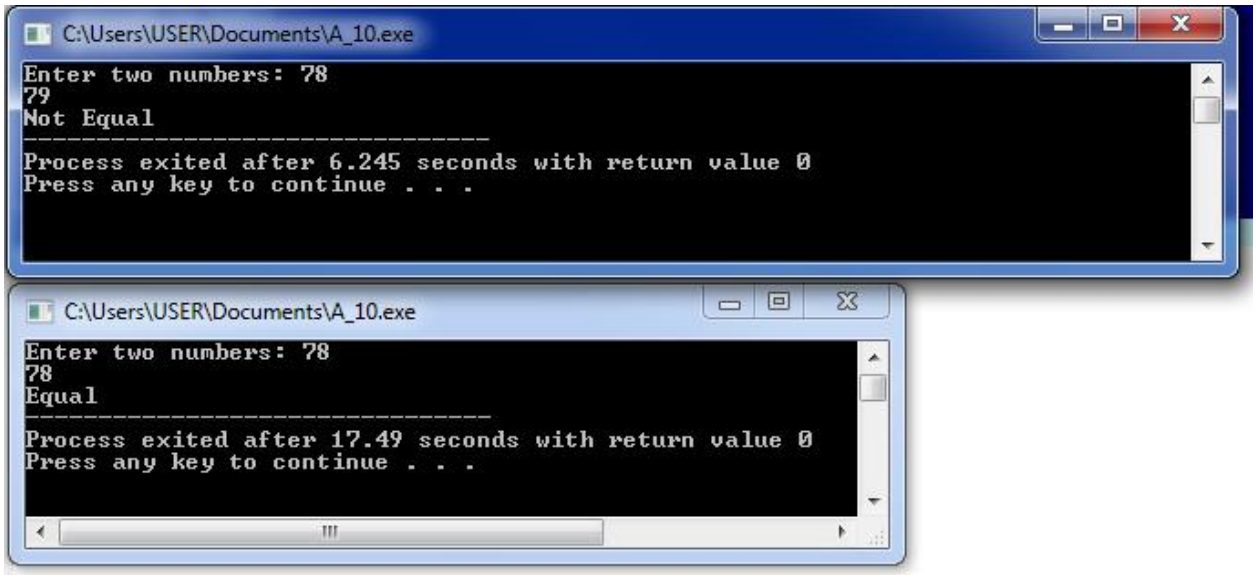
```
d=2*a+b*b+c;

printf(" The result is:%d",d);

return 0;

}
```


```
/*8) Take a,b,c as input from user and print resultant d where d = 2a^3 + b^2 + c/b  */

#include<stdio.h>

int main() {

int a,b,c,d;

printf("Waiting for three integers a , b & c:\n");

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

d=2*a*a*a+b*b+c/b;

printf(" The result is:%d",d);

return 0;

}
```


```
/*9) Take two inputs from user and print the bigger number. */
```

```c
#include <stdio.h>
int main()
{   int num1, num2;

   /* Input two numbers from user */
   printf("Enter two numbers: ");
   scanf("%d%d", &num1, &num2);

   /* If num1 is maximum */
   if(num1 > num2)
   {
      printf("%d is maximum", num1);
   }

   /* If num2 is maximum */
   if(num2 > num1)
   {
      printf("%d is maximum", num2);
   }

   /* Additional condition check for equality */
   if(num1 == num2)
   {
      printf("Both are equal");
   }

   return 0;
}
```

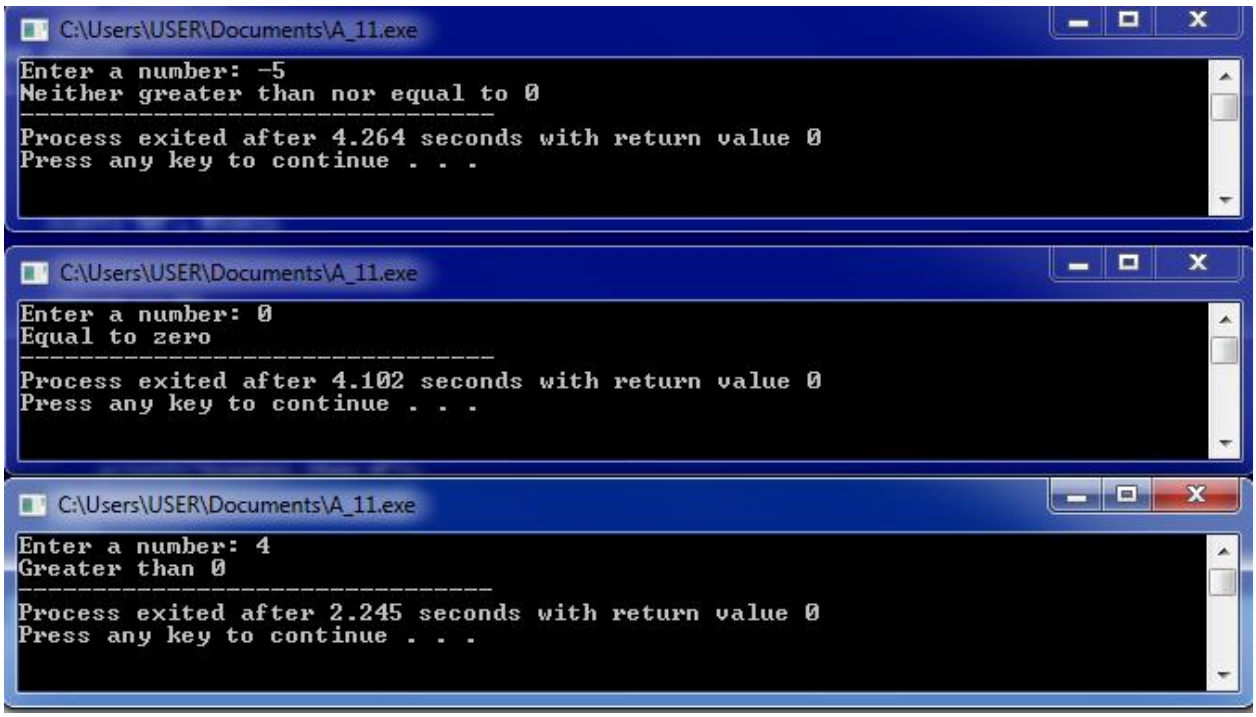

```
/*10) Take two inputs from user and check if they are equal or not. */

#include <stdio.h>


int main()

{

   int num1, num2;


   /* Input two numbers from user */

   printf("Enter two numbers: ");

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


   /* If num1 is maximum */

   if(num1 == num2)

   {

      printf("Equal");

   }

  else

     printf("Not Equal");


return 0;

}
```



/* 11) Take input from user and check whether it is greater than equal to 0 or not */

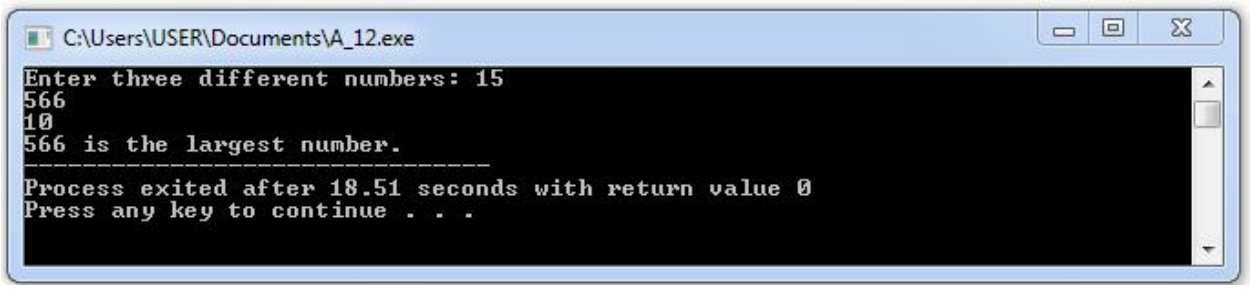
```
#include <stdio.h>


int main()
{
   int num;


   /* Input a number from user */
   printf("Enter a number: ");
   scanf("%d", &num);
   if(num == 0){
   printf("Equal to zero");
   }
   else if(num>0)
   {
         printf("Greater than 0");
         }
         else
```

```
        printf("Neither greater than nor equal to 0");
    return 0;
}
```



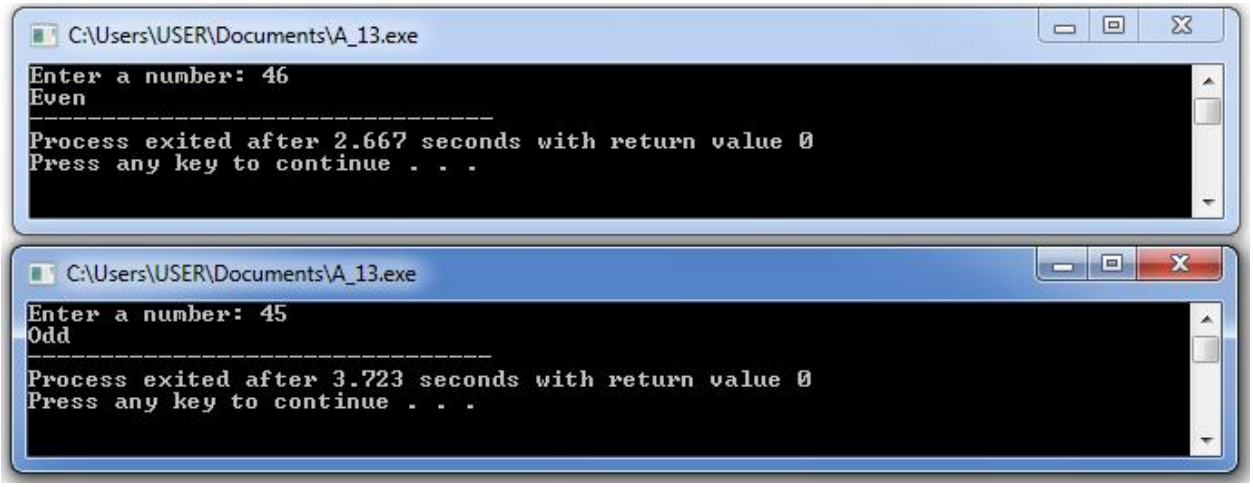

```
/*12) Take three inputs from user and print the bigger number. */
#include <stdio.h>
int main()
{
   int n1, n2, n3;

   printf("Enter three different numbers: ");
   scanf("%d %d %d", &n1, &n2, &n3);

   if( n1>=n2 && n1>=n3 )
      printf("%d is the largest number.", n1);

   if( n2>=n1 && n2>=n3 )
```

```
        printf("%d is the largest number.", n2);

    if( n3>=n1 && n3>=n2 )
        printf("%d is the largest number.", n3);

    return 0;
}
```

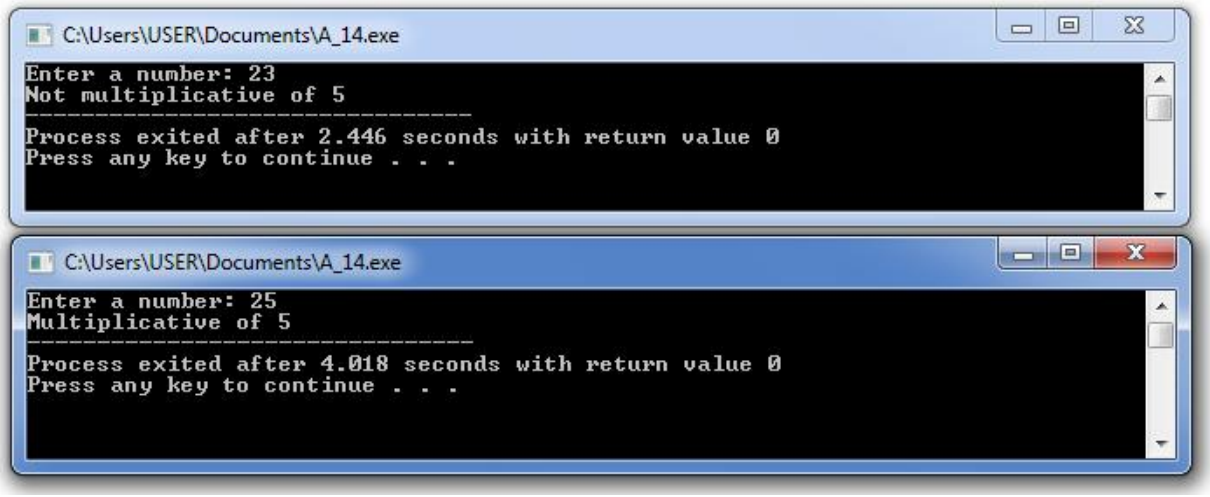



```
/* 13) Take input from user and check whether it is even or odd and print respectively. */
#include <stdio.h>

int main()
{
    int num;

    /* Input a number from user */
    printf("Enter a number: ");
    scanf("%d", &num);
    if(num%2==0)
    printf("Even");
    else
    printf("Odd");

    return 0;
```

}




```
/*  14) Take input from user and check whether it is multiplicative of 5. */

#include<stdio.h>

int main()

{

   int num;


   /* Input a number from user */

   printf("Enter a number: ");

   scanf("%d", &num);

   if(num%5==0)

   printf("Multiplicative of 5");

   else

   printf("Not multiplicative of 5");

   return 0;

}
```



/*Take input number a,b and character +,-,*, / as input from user and print the result performing corresponding operation. (P.S: Prevent multiplication and division by zero)

Sample input Sample output

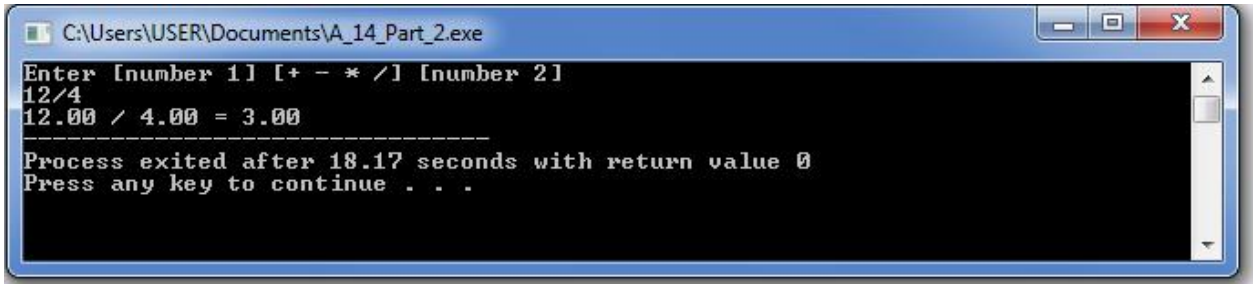
Enter a, b: 12

3 4

Enter Operation:* */

```
#include <stdio.h>
int main()
{   char op;
    float num1, num2, result=0.0f;
    do{printf("Enter [number 1] [+ - * /] [number 2]\n");
       scanf("%f %c %f", &num1, &op, &num2);}
while(num1==0||num2==0);
    switch(op){
        case '+': result = num1 + num2;break;
        case '-': result = num1 - num2;break;
        case '*': result = num1 * num2;break;
        case '/': result = num1 / num2;break;
```

```
    default: printf("Invalid operator");    }
   printf("%.2f %c %.2f = %.2f", num1, op, num2, result);
   return 0;
}
```



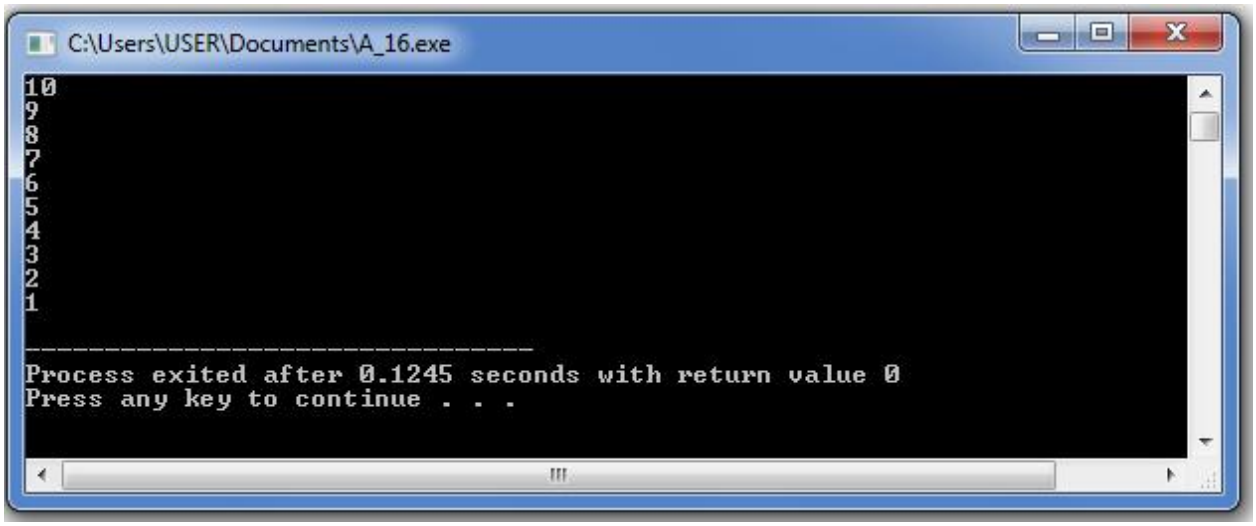
/*15) Print 1 to 10 using for loop. */

```
#include<stdio.h>
int main()
{int i;
for(i=1;i<=10;i++) printf("%d\n",i);
return 0;
}
```

/*16) Print 10 to 1 using while loop */

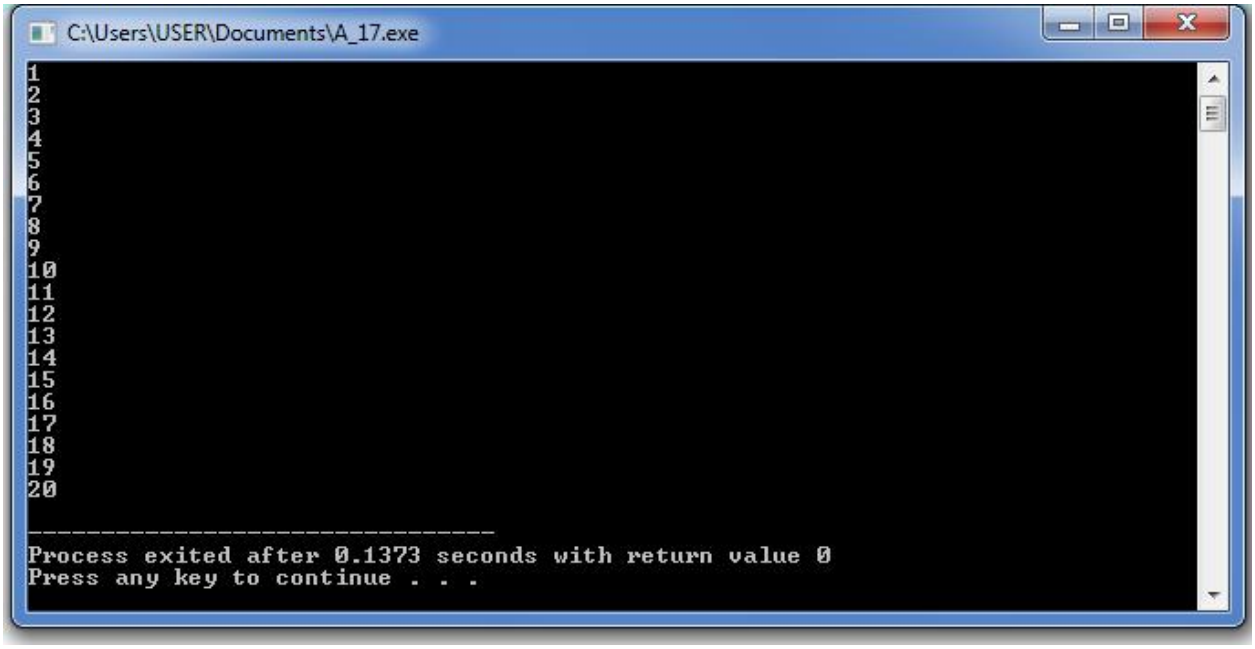
```
#include<stdio.h>
```

```
int main()
{
int i=10;
while(i>0)
{
printf("%d\n",i);
i--;
}
return 0;
}
```

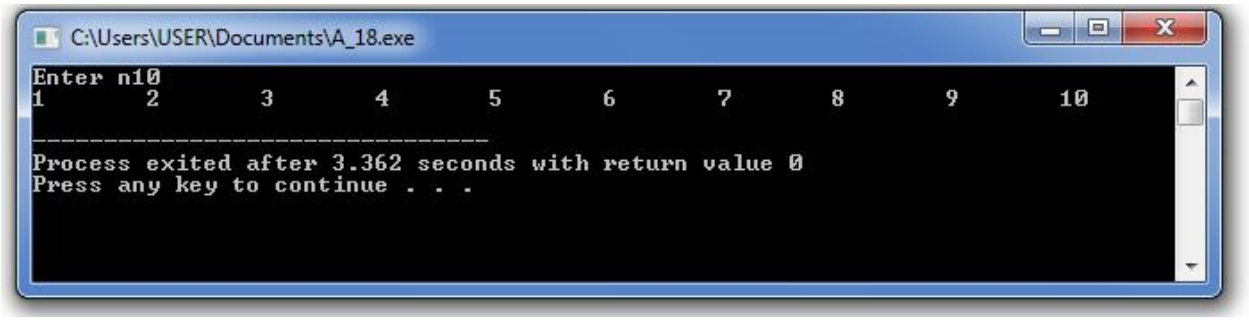



```
/* 17) Print 1 to 20 using do while loop. */
#include<stdio.h>
int main()
{
int i=1;
do
{
printf("%d\n",i);
i++;
```

```
}
while(i<=20);
return 0;
}
```




```
/*18) Take a number as input from user and print from 1 to up to that number using for loop
Sample input          Sample output
Enter Number:          1 2 3 4 5 6 7 8 9 10
10    */

#include<stdio.h>
int main()
{int i,n;
printf("Enter n");
scanf("%d",&n);
for(i=1;i<=n;i++) printf("%d\t",i);
return 0;
}
```



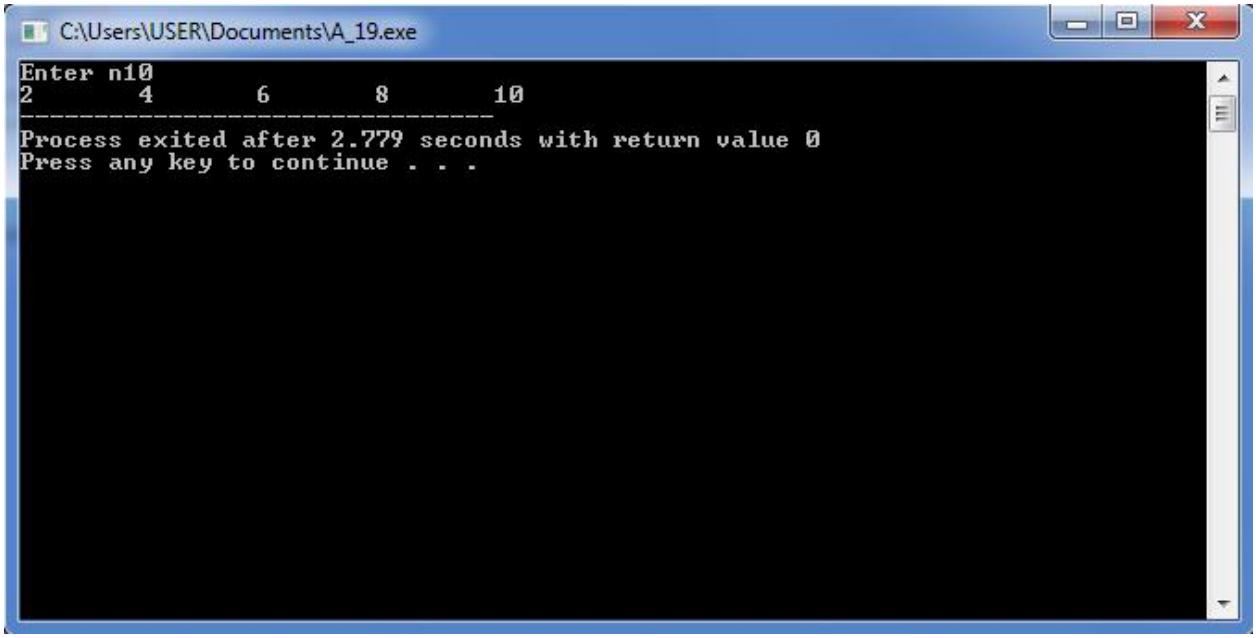
/*19) Take a range as input from user and print all the even number up to that number.

Sample input Sample output

Enter Number: 2 4 6 8 10

10 */

```
#include<stdio.h>

int main()

{int i,n;

printf("Enter n");

scanf("%d",&n);

for(i=1;i<=n;i++){

        if(i%2==0)


         printf("%d\t",i);}

return 0;

}
```



/*20) Write code for following input and corresponding output.

Sample input Sample output

Enter n:

3

Enter Range:

10 1 2 3 4 5 6 7 8 9 10

Enter Range:

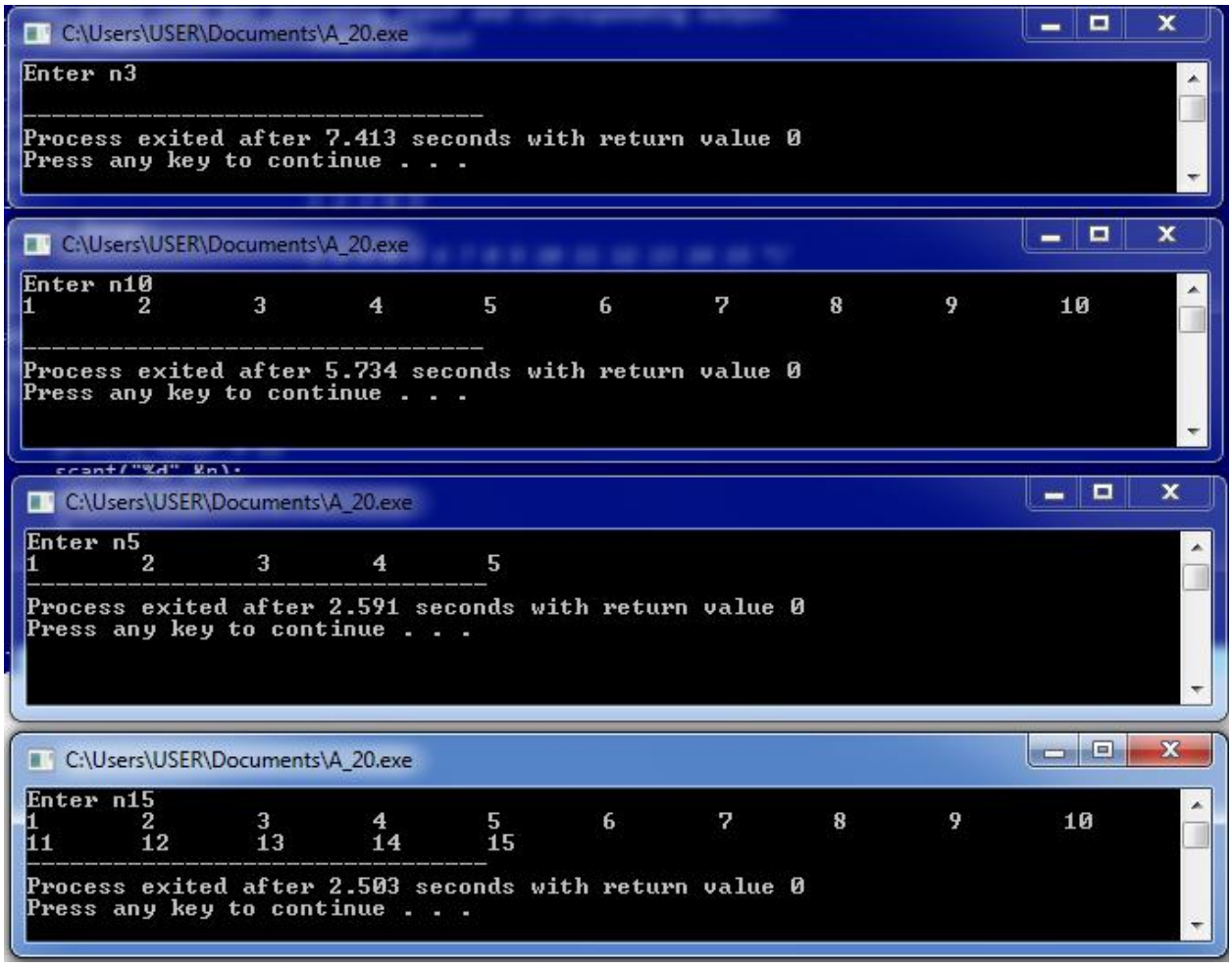
5 1 2 3 4 5

Enter Range:

15 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 */

```
#include<stdio.h>
int main(void)
{
	int i,n;
	printf("Enter n");
```

```
        scanf("%d",&n);
        if(n%5!=0){printf("");
        }
        else{
                for(i=1;i<=n;i++) printf("%d\t",i);
                        }
        return 0;
}
```



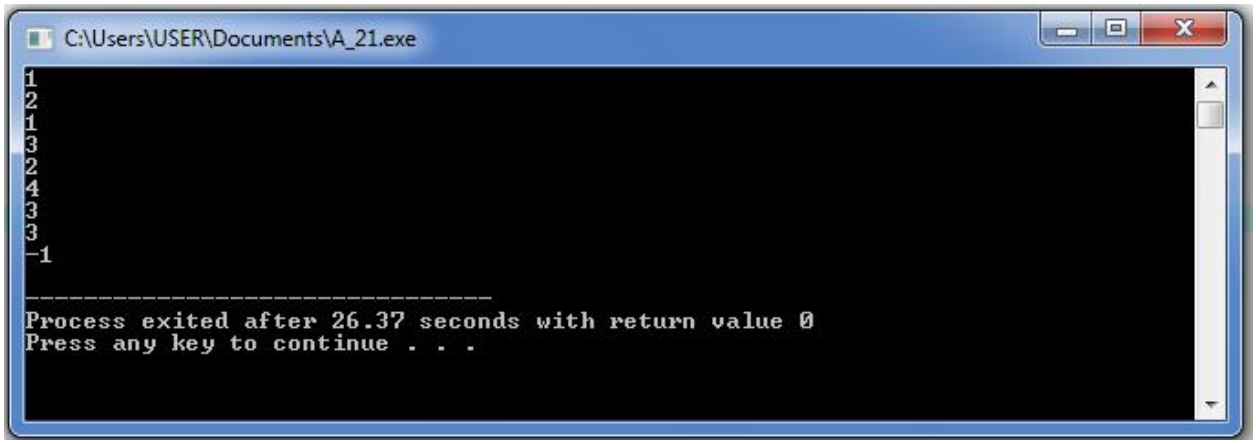
/*21) Keep taking input from user and print it until user hits a negative value.

Sample input Sample output

1 1

2 2

```
3           3
4           4
-1                  */

#include<stdio.h>
#include<conio.h>
int main(void)
{
        int num,i,j;

        for(i=0;i<20 ;i++){

        scanf("%d",&num);
        for(j=1;j<=num;j++){
        if(j%2==0)

         printf("%d\n",i);}
        if(num<0)
        {i=23;
        }
   }
   return 0;
}
```



/*22) Write code for following input and corresponding output.

Sample input Sample output

Enter n:

3

Enter Range: Even Numbers in this range:

10 2 4 6 8 9 10

Enter Range: Even Numbers in this range:

5 2 4

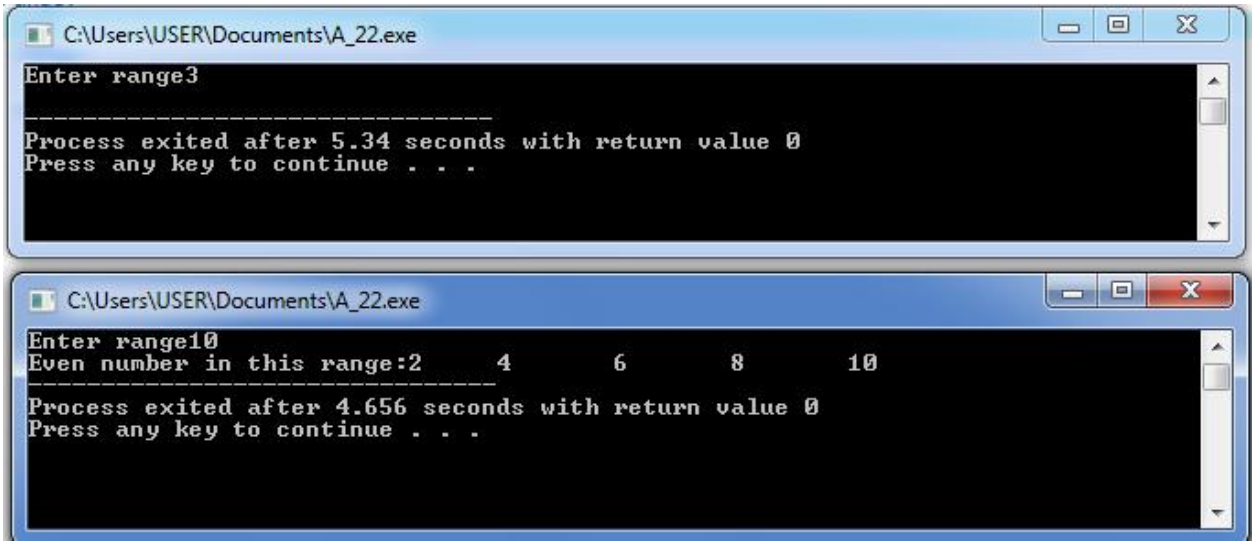
Enter Range: Even Numbers in this range:

15 2 4 6 8 10 12 14

*/

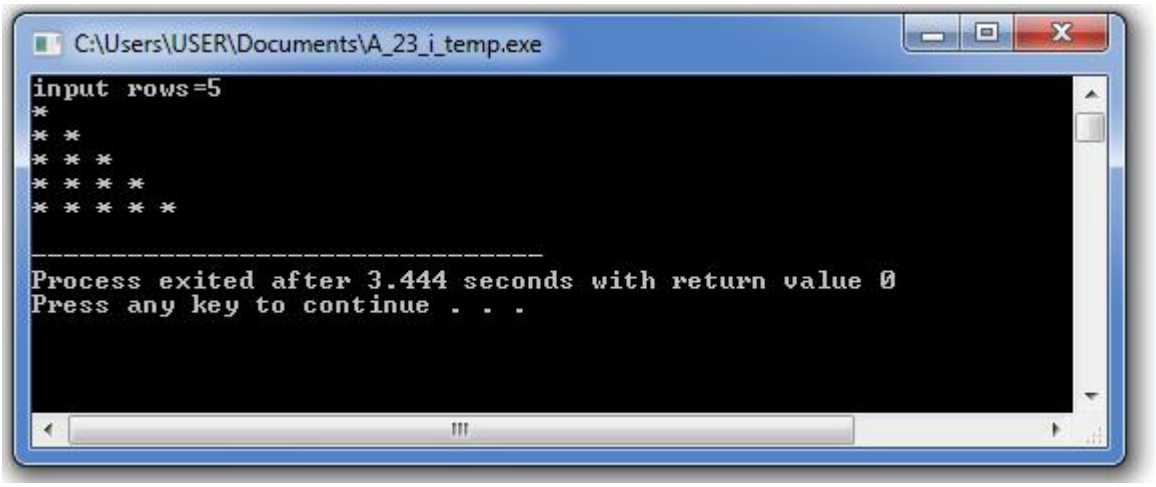
```
#include<stdio.h>
int main()
{int i,n;
printf("Enter range");
scanf("%d",&n);
if(n==3) printf("");
else{printf("Even number in this range:");
for(i=1;i<=n;i++){
        if(i%2==0){
```

```
        printf("%d\t",i);}
}
}
return 0;
}
```




```
/*23) Write code to produce the following outputs.
i) Sample output

*
**
***
****
*****       */
#include<stdio.h>
#include<conio.h>
int main(void){
        int i,j,rows;
        printf ("input rows=");
        scanf ("%d",&rows);
```

```
	for(i=1;i<=rows;++i){
		for(j=1;j<=i;++j){
			printf("* ");
		}
		printf("\n");
	}
	return 0;
}
```

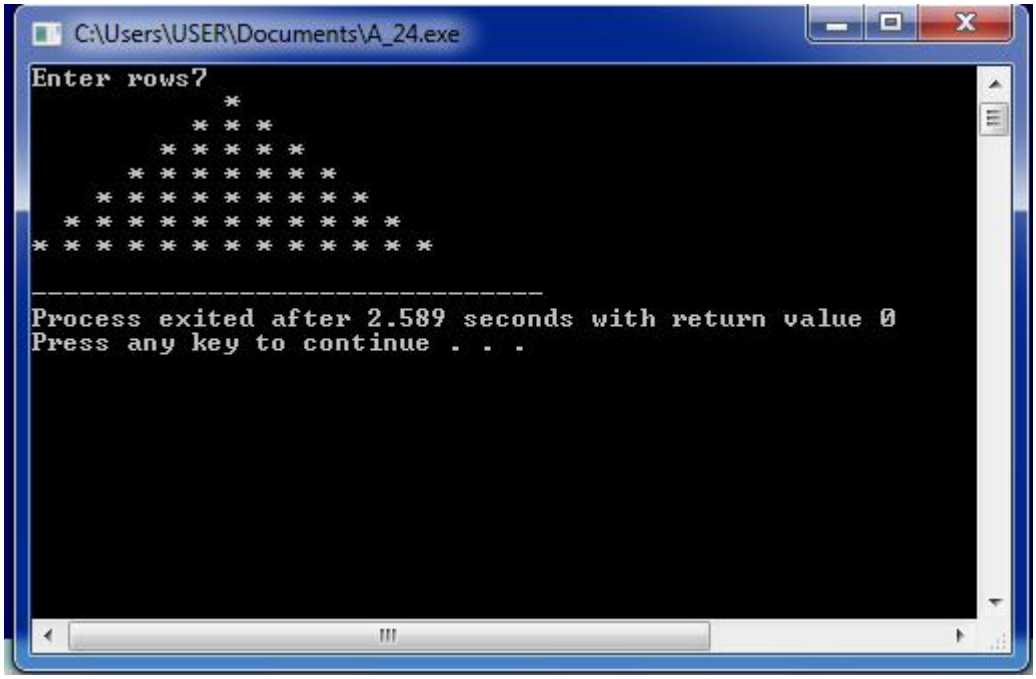



```
/*23) Write code to produce the following outputs.
ii) Sample output
*****
****
***
**
*       */
#include<stdio.h>
#include<conio.h>
int main(void){
```

```
        int i,j,n;
        printf ("input n=");
        scanf ("%d",&n);
        for(i=1;i<=n;i++){
                for(j=n;j>=i;j--){
                        printf("*");
                }
                printf("\n");
        }
        getch();
}
```


```
 * */* 23(iii) Sample output
  *


 * * *
 * * * *
* * * * *        */
#include<stdio.h>
int main(void)
```

```
{ int rows,space,i,k=0;
        printf("Enter rows");
        scanf("%d",&rows);
        for(i=1;i<=rows;++i,k=0)
        {
                for(space=1;space<=rows-i;++space)
                {
                        printf("  ");
                }
                while(k!=2*i-1)
                {
                        printf("* ");
                        ++k;
                }
        printf("\n");
        }
        return 0;
        }
```



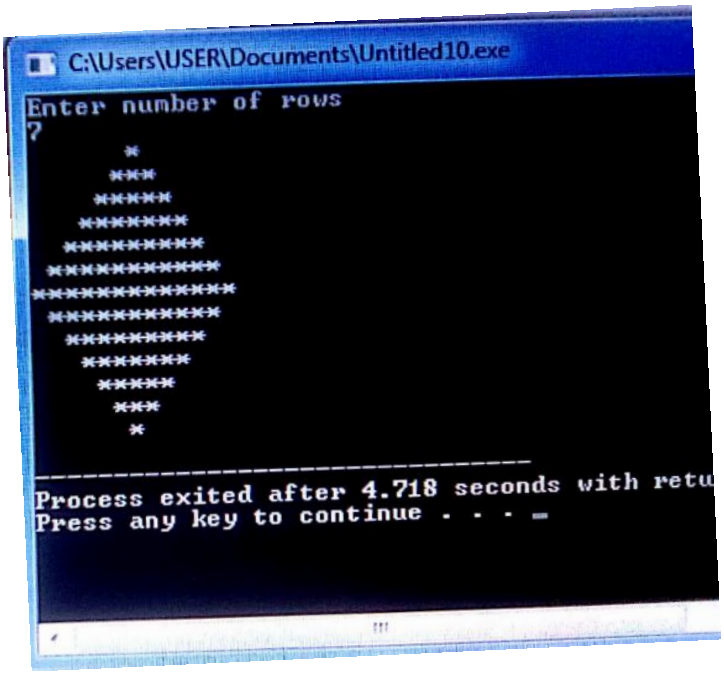
iv) Sample output

```
   *
  * *
 * * *
* * * *
 * * *
  * *
   *     */
```

```
#include <stdio.h>
int main()
{
  int n, c, k, space = 1;
  printf("Enter number of rows\n");
  scanf("%d", &n);
```

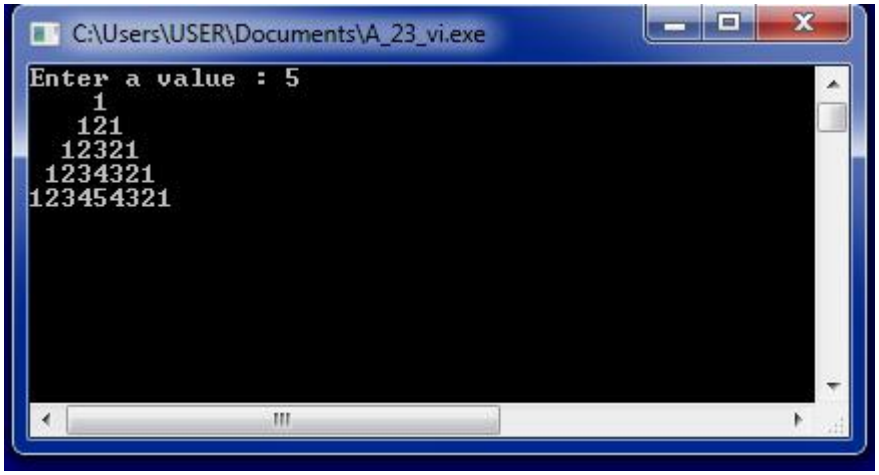
```
space = n - 1;

for (k = 1; k <= n; k++)
{
  for (c = 1; c <= space; c++)
    printf(" ");

  space--;

  for (c = 1; c <= 2*k-1; c++)
    printf("*");

  printf("\n");
}

space = 1;

for (k = 1; k <= n - 1; k++)
{
  for (c = 1; c <= space; c++)
    printf(" ");

  space++;

  for (c = 1 ; c <= 2*(n-k)-1; c++)
    printf("*");

  printf("\n");
```

```
 }


 return 0;
}
```



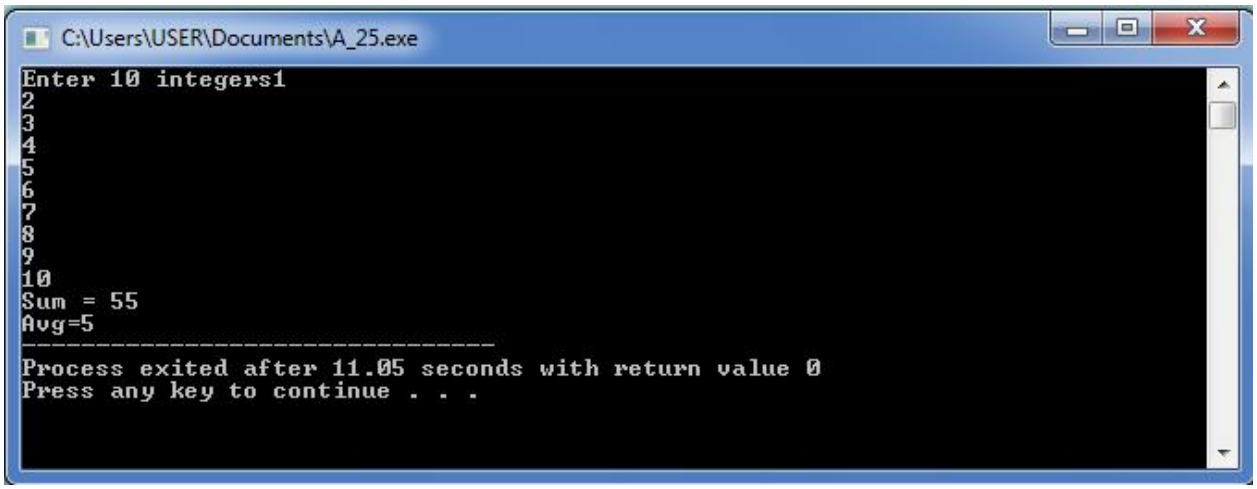

```
/*vi) Sample output
      1
    1 2 1
  1 2 3 2 1
1 2 3 4 3 2 1      */


#include<stdio.h>

#include<conio.h>

main()

{


int i,j,n,k;

printf("Enter a value : ");

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

```
for(i=1;i<=n;i++)
 {
  for(j=1;j<=n-i;j++)
   printf(" ");
  {
   for(j=1;j<=i;j++)
   printf("%d",j);
   j=1;
   for(j=i;i>=j;j--)
   if(j==0)
   break;
   else
   {
   k=j-1;
   if(k==0)
   break;
   else
   printf("%d",k);
   }
   printf("\n");
   }
   }
 getch();
}
```



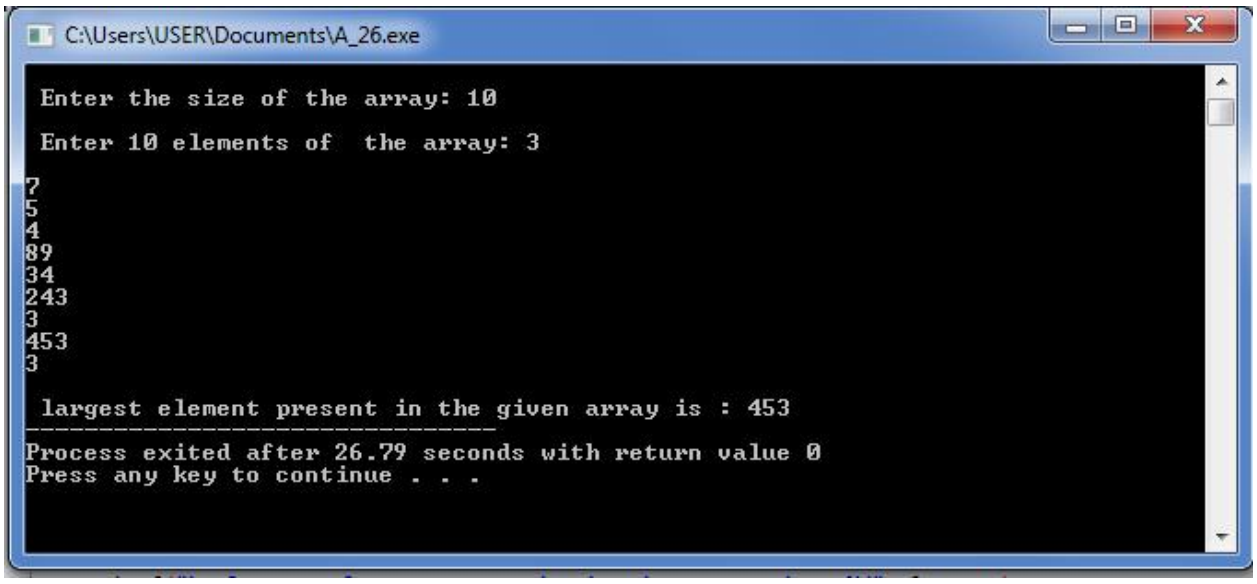

```
/* 24) Take user's name as input from user and then print it.  */

#include <stdio.h>


int main()

{

  char s[100];

  int c = 0;

printf("Enter name;press Enter button to exit");

  gets(s);


  while (s[c] != '\0') {

    printf("%c", s[c]);

    c++;

  }


  return 0;

}
```


```
/* 25) Take 10 integer inputs from user save them in array and then calculate sum and average
of those number and print them.  */
#include <stdio.h>

int main()
{
  int no, sums = 0, c, array[100];

  printf("Enter 10 integers");

  for (c = 0; c < 10; c++)
  {
    scanf("%d", &array[c]);
    sums = sums + array[c];
  }

  printf("Sum = %d\n",sums);
  printf("Avg=%d",sums/10);

  return 0;
}
```



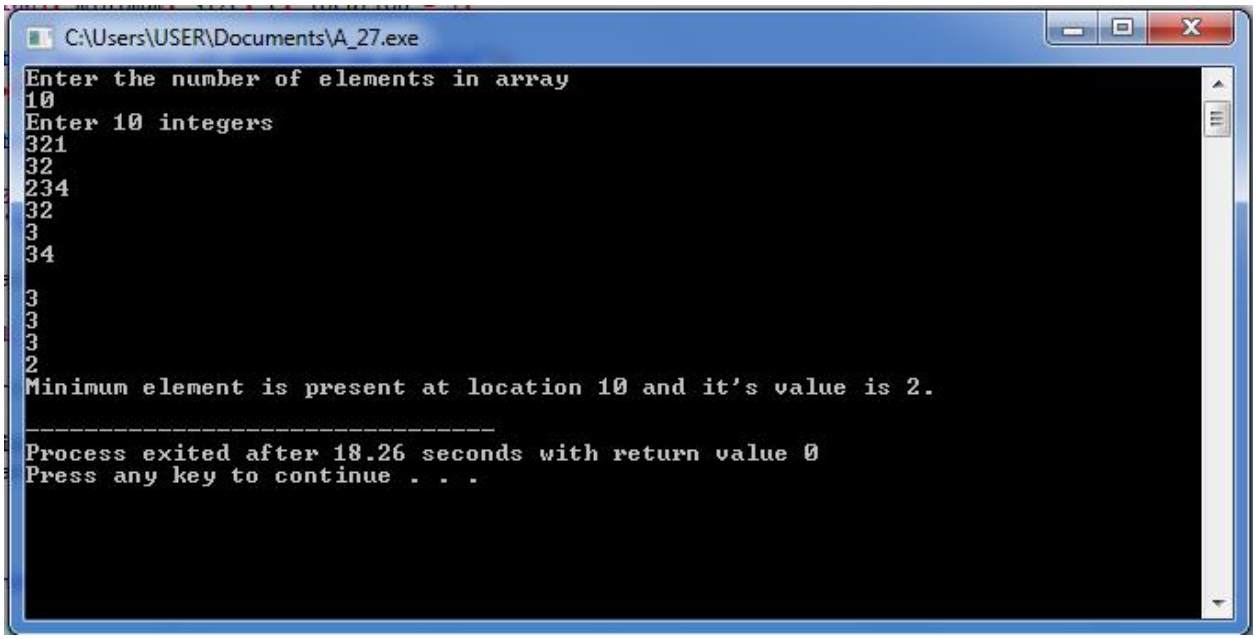
/*26) Take integer 10 inputs from user in array and find out the largest number in the array. */

```
#include <stdio.h>

int main()
{

	int array[50], size, i, largest;

	printf("\n Enter the size of the array: ");
	    scanf("%d", &size);

	printf("\n Enter %d elements of  the array: ", size);

	for (i = 0; i < size; i++)
			scanf("%d", &array[i]);

	largest = array[0];

	for (i = 1; i < size; i++)
	{
			if (largest < array[i])
				largest = array[i];
	    }

	printf("\n largest element present in the given array is : %d", largest);

	return 0;

}
```



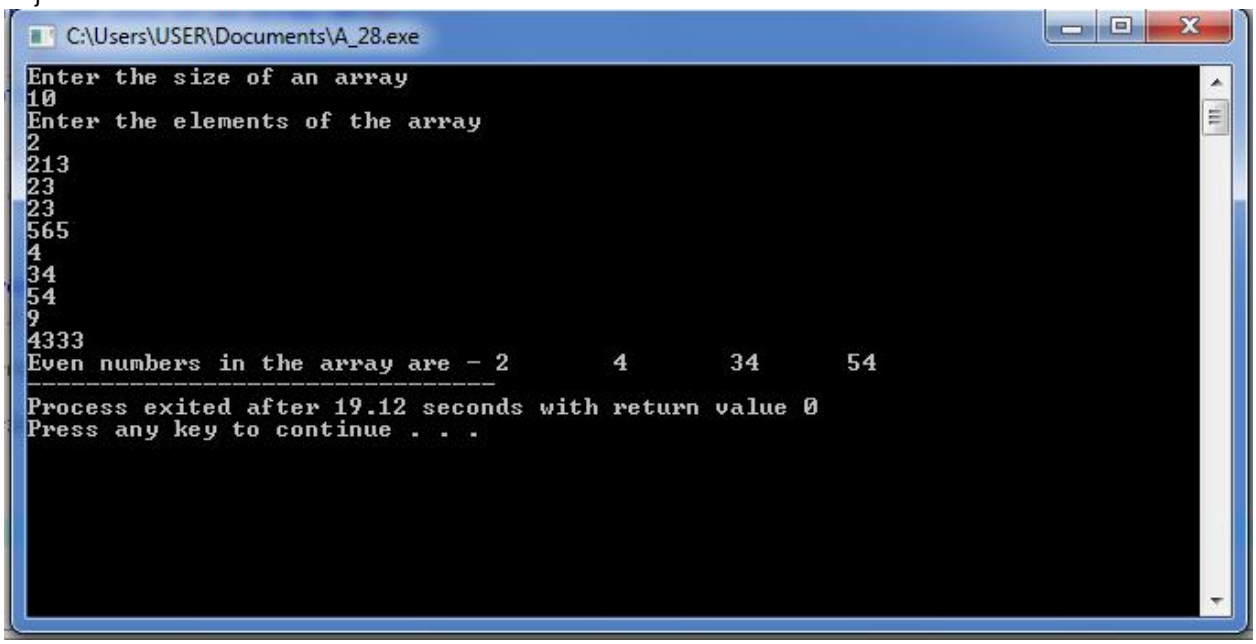
/*27) Take integer 10 inputs from user in array and find the minimum number in the array. */

```
#include <stdio.h>

int main()
{
   int array[100], minimum, size, c, location = 1;

   printf("Enter the number of elements in array\n");
   scanf("%d",&size);

   printf("Enter %d integers\n", size);

   for ( c = 0 ; c < size ; c++ )
      scanf("%d", &array[c]);

   minimum = array[0];

   for ( c = 1 ; c < size ; c++ )
   {
      if ( array[c] < minimum )
      {
         minimum = array[c];
         location = c+1;
      }
   }

   printf("Minimum element is present at location %d and it's value is %d.\n", location, minimum);
   return 0;
}
```

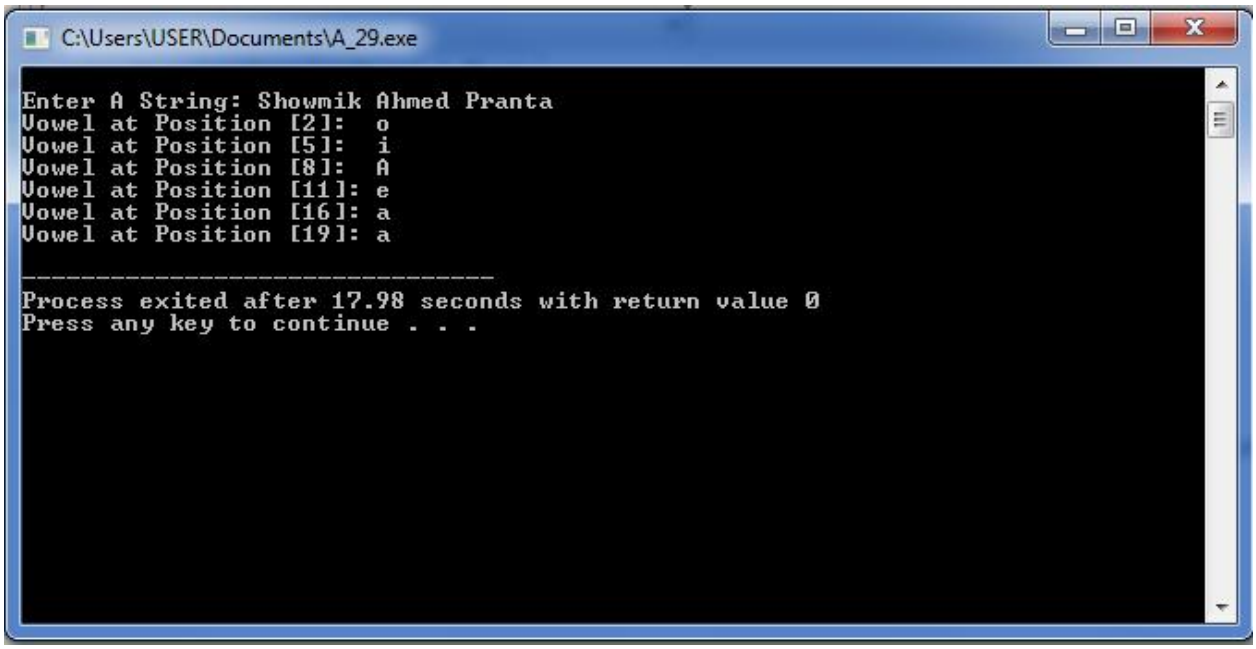



```
/*28) Take integer 10 inputs from user and print only the even numbers in that array. */
#include <stdio.h>
  void main()
  {

     int array[100], i, num;
     printf("Enter the size of an array \n");

     scanf("%d", &num);
     printf("Enter the elements of the array \n");

     for (i = 0; i < num; i++)
     {
        scanf("%d", &array[i]);
     }

     printf("Even numbers in the array are - ");
     for (i = 0; i < num; i++)
     {
        if (array[i] % 2 == 0)
        {
           printf("%d \t", array[i]);
        }
     }

     printf("\n Odd numbers in the array are -");
     for (i = 0; i < num; i++)
     {
        if (array[i] % 2 != 0)
```

```
        {
            printf("%d \t", array[i]);
        }
     }

   }
```




```
/*29) Take 10 characters as input from user and print only the vowels*/
#include<stdio.h>
#include<string.h>

int main()
{
    int count, length;
    char str[30];
    printf("\nEnter A String:\t");
    scanf("%[^\n]s", str);
    length = strlen(str);
    for(count = 0; count < length; count++)
    {
        if(str[count] == 'a' || str[count] == 'e' || str[count] == 'i' || str[count] == 'o' || str[count] == 'u' ||
str[count] == 'A' || str[count] == 'E' || str[count] == 'I' || str[count] == 'O' || str[count] == 'U')
        {
            printf("Vowel at Position [%d]:\t%c\n", count, str[count]);
        }
    }
    return 0;
}
```



/*30) Ask the user whether he wants to give input (y/n). If y is pressed then take the name of the user as input and print it then ask him again if he wants to give input. If n is pressed simply terminate the program.

Sample input

Do you want to give input (y/n):
y

Woody allen

Do you want to give input (y/n):
y

Woody allen

Do you want to give input (y/n):
y

Tom Hanks

Tom Hanks

Do you want to give input (y/n):
y

Snowden

Snowden

Do you want to give input (y/n):
N

Sample output

*/

```
#include<stdio.h>
#include<conio.h>
int main()
{   int i;
        char str[100];
        char ch;
        printf("Enter your choice(Y\N)");
        scanf("%c",&ch);
        if(ch=='Y'||ch=='y'){
                printf("Enter name : ");
                scanf("%s",str);
```

```
                printf("\n Name=%s",str);
        }
return 0;
        }
```

/*31) Take 10 inputs from user. Then ask the user two index i and j and swap the i!" element of the array with the j!" element.

Sample input Sample output

Enter number of input: Before swapping the array:

1 2 3 4 5 6 7 8 9 10 1 2 3 4 5 6 7 8 9 10

Enter first index i: After swapping the array

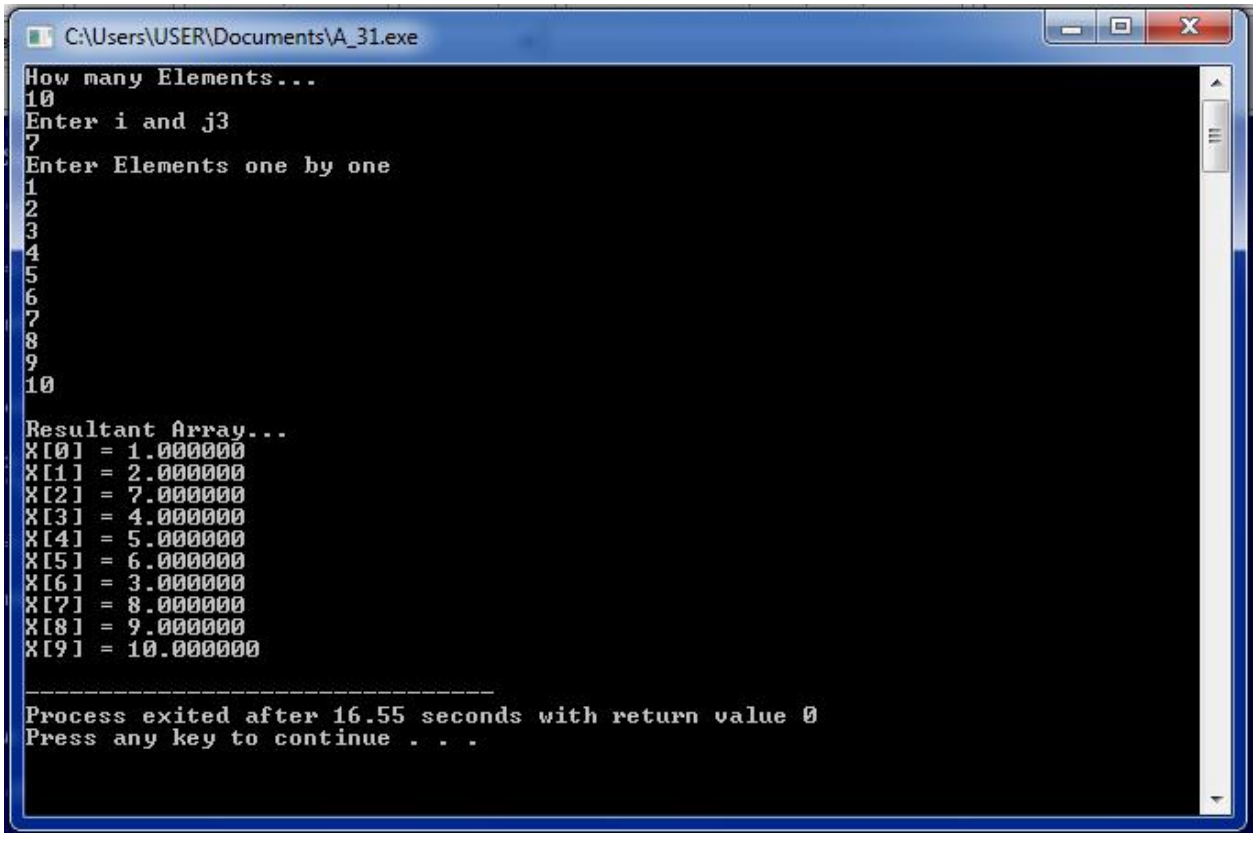
3 1 2 7 4 5 6 3 8 9 10

Enter second index j:

7 */

```
#include <stdio.h>
   void swapij(float *ptr1, float *ptr2);
   int main()
   {

      float x[10];
      int k, n,i,j;

      printf("How many Elements...\n");
      scanf("%d", &n);
       printf("Enter i and j");
      scanf("%d%d",&i,&j);

      printf("Enter Elements one by one\n");

      for (k = 0; k < n; k++)
      {
         scanf("%f", x + k);
      }

      /*  Function call:Interchanging ith element by jth */

      swapij(x + i-1, x + j-1);
      printf("\nResultant Array...\n");
```

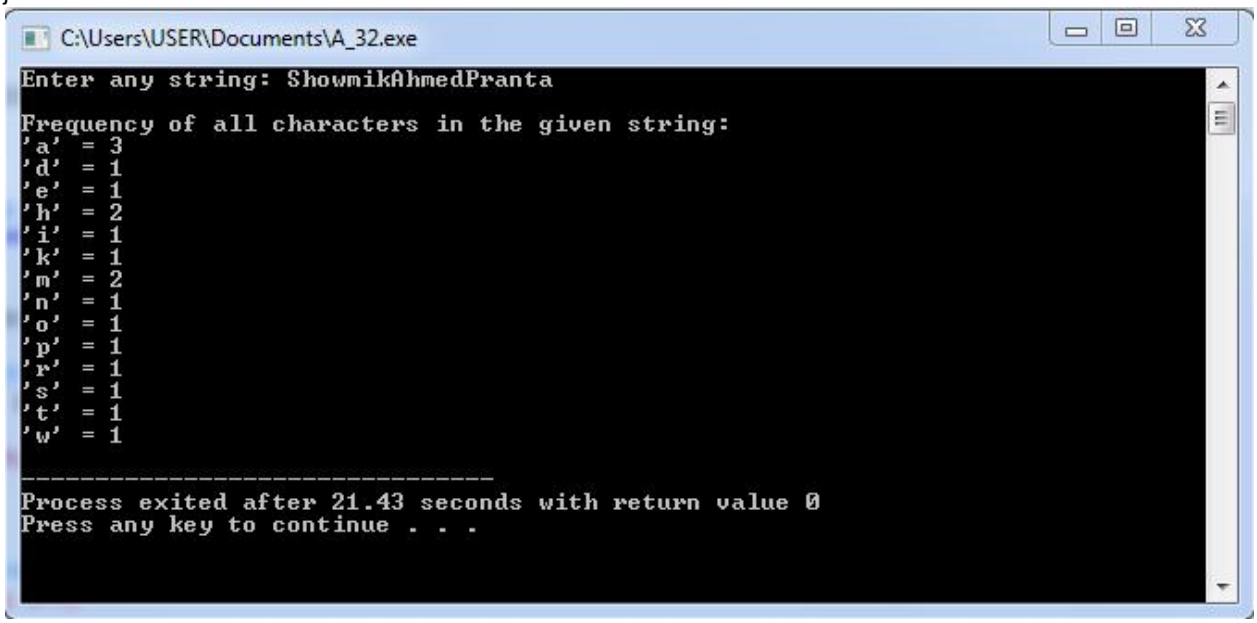
```
    for (k = 0; k < n; k++)
    {
       printf("X[%d] = %f\n", k, x[k]);
    }

}

/*  Function to swap the ith element with the jth element in the array */

void swapij(float *ptr1, float *ptr2 )
{

    float temp;
    temp = *ptr1;
    *ptr1 = *ptr2;
    *ptr2 = temp;

}
```



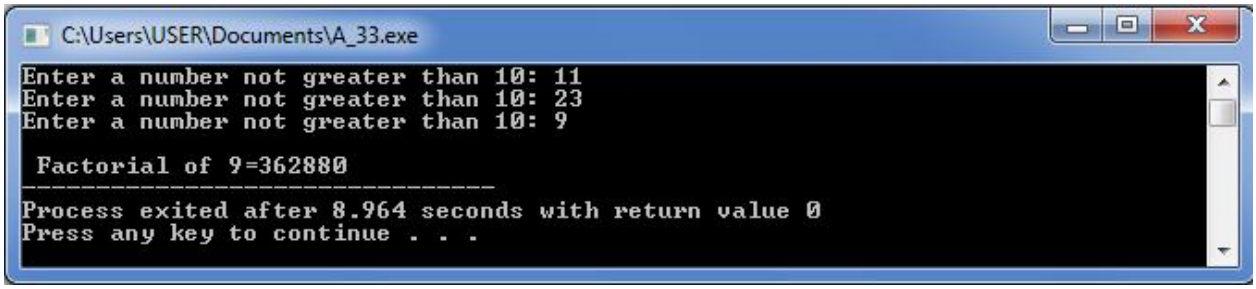
/*32) Take any 10 English alphabet input from user and count the frequency of each of the alphabets (Ignore printing the alphabets whose frequency in zero)
Sample Input Sample Output
a b a c d e f c n d a = 2

```
b = 1
c = 2
d = 2
e = 1
f = 1 */
#include <stdio.h>
#include <string.h>
#define MAX_SIZE 10 // Maximum string size

int main()
{
   char str[MAX_SIZE];
   int i, len;
   int freq[26];

   /* Input string from user */
   printf("Enter ten alphabets: ");
   gets(str);

   len = strlen(str);

   /* Initialize frequency of each character to 0 */
   for(i=0; i<26; i++)
   {
      freq[i] = 0;
   }


   /* Find total number of occurrences of each alphabet */
   for(i=0; i<len; i++)
   {
      /* If the current character is lowercase alphabet */
      if(str[i]>='a' && str[i]<='z')
      {
         freq[str[i] - 97]++;
      }
      else if(str[i]>='A' && str[i]<='Z')
      {
         freq[str[i] - 65]++;
      }
   }

   /* Print the frequency of all letter in the string */
   printf("\nFrequency of all letters in the given string: \n");
   for(i=0; i<26; i++)
   {
      /* If current character exists in given string */
      if(freq[i] != 0)
```

```
    {
        printf("'%c' = %d\n", (i + 97), freq[i]);
    }
  }

  return 0;
}
```

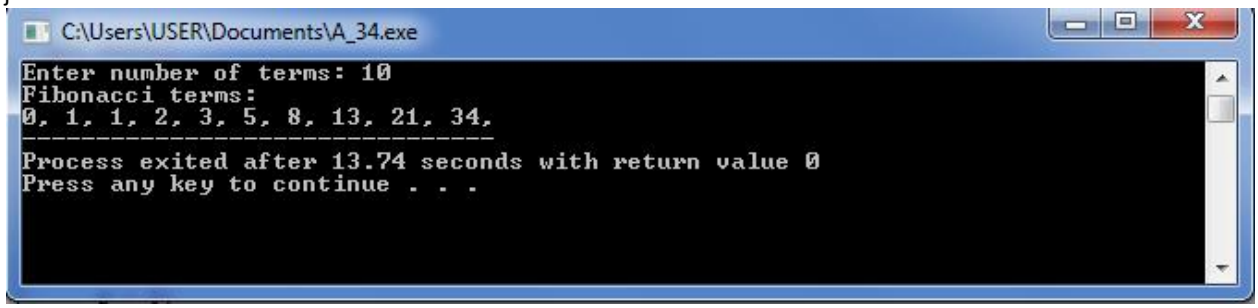



```
/*33) Take an integer N input from user and calculate factorial of N (N<10).*/
#include<stdio.h>
#include<conio.h>

int main(void)
{
        long int n,fact=1,i;
        do{
                printf("Enter a number not greater than 10: ");
                scanf("%ld",&n);
        }
        while(n>=10);
        for(i=1;i<=n;i++)
        {
                fact=fact*i;
        }
        printf("\n Factorial of %ld=%ld",n,fact);
        return 0;
}
```



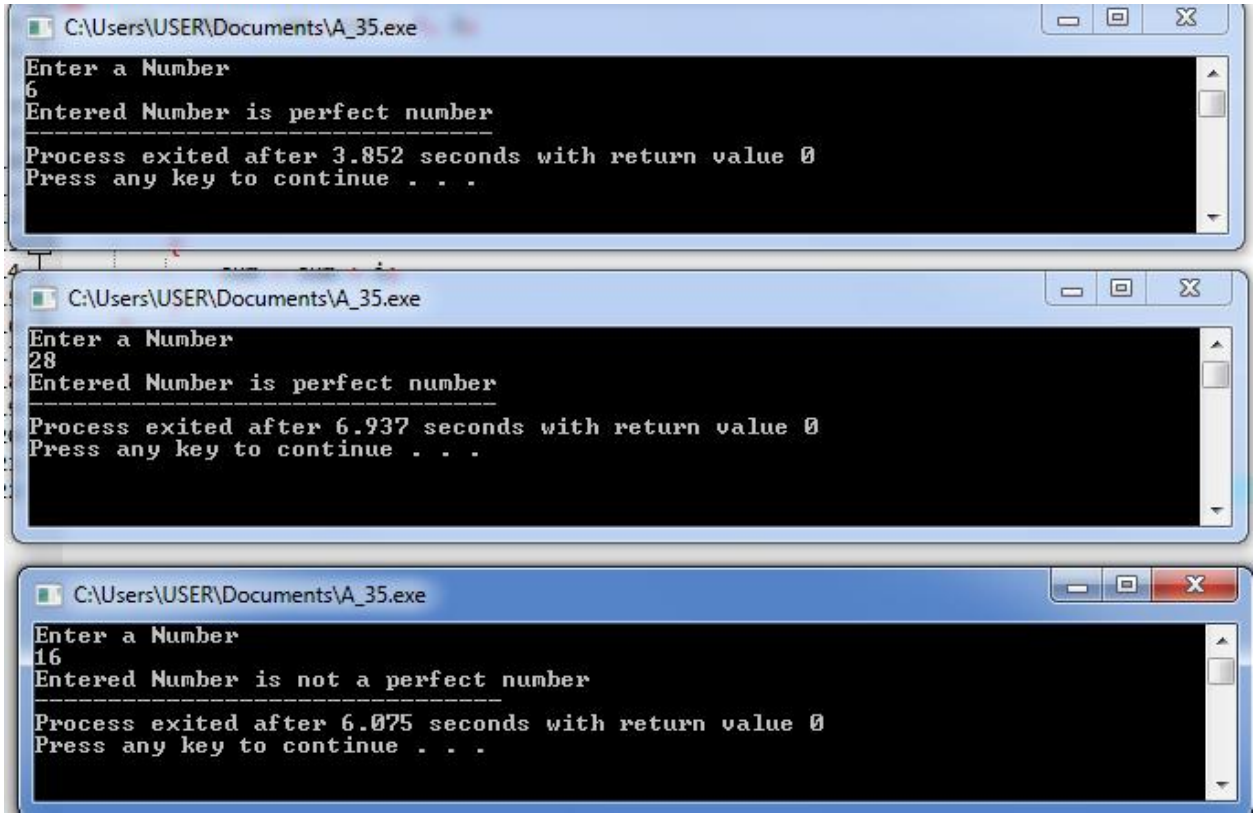
/*34) Take an integer N input from user and generate the Fibonacci series up to the Nth term.*/

```
#include <stdio.h>

int main()
{
   int a, b, c, i, terms;

   /* Input number from user */
   printf("Enter number of terms: ");
   scanf("%d", &terms);

   /* Fibonacci magic initialization */
   a = 0;
   b = 1;
   c = 0;

   printf("Fibonacci terms: \n");

   /* Iterate through n terms */
   for(i=1; i<=terms; i++)
   {
      printf("%d, ", c);

      a = b;    // Copy n-1 to n-2
      b = c;    // Copy current to n-1
      c = a + b; // New term
   }

   return 0;
}
```



/*35) Take an integer N input from user and determine whether it is a perfect number or not */

```
#include <stdio.h>

int main()
{
   int number, rem, sum = 0, i;

   printf("Enter a Number\n");
   scanf("%d", &number);
   for (i = 1; i <= (number - 1); i++)
   {
      rem = number % i;
           if (rem == 0)
      {
         sum = sum + i;
      }
   }
   if (sum == number)
      printf("Entered Number is perfect number");
   else
      printf("Entered Number is not a perfect number");
   return 0;
}
```



/*36) Take 10 integer input from user and sort them using
i) Merge Sort */

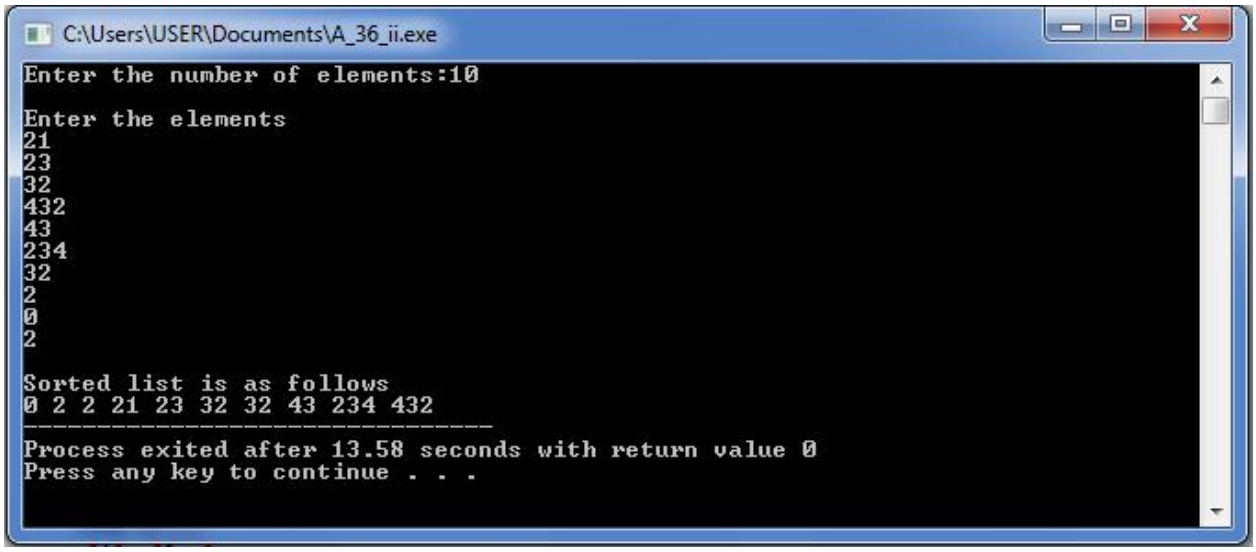
```
#include<stdio.h>

void mergesort(int a[],int i,int j);
void merge(int a[],int i1,int j1,int i2,int j2);
int a[30],n,i;
int main()
{
printf("Enter no of elements:");
scanf("%d",&n);
printf("Enter array elements:");
for(i=0;i<n;i++)
scanf("%d",&a[i]);
mergesort(a,0,n-1);
printf("\nSorted array is :");
for(i=0;i<n;i++)
printf("%d ",a[i]);
return 0;
}
void mergesort(int a[],int i,int j)
{
int mid;
if(i<j)
{
mid=(i+j)/2;
mergesort(a,i,mid);/*left recursion*/
mergesort(a,mid+1,j);/*right recursion*/
merge(a,i,mid,mid+1,j);/*merging of two sorted sub-arrays*/
}
}
void merge(int a[],int i1,int j1,int i2,int j2){
int temp[50];/*array used for merging*/
int i,j,k;
i=i1;/*beginning of the first list*/
j=i2;/*beginning of the second list*/
k=0;
while(i<=j1 && j<=j2)/*while elements in both lists*/
{
if(a[i]<a[j])
temp[k++]=a[i++];
else
temp[k++]=a[j++];
}
while(i<=j1)/*copy remaining elements of the first list*/
temp[k++]=a[i++];
while(j<=j2)/*copy remaining elements of the second list*/
temp[k++]=a[j++];/*Transfer elements from temp[] back to a[]*/
```

```
for(i=i1,j=0;i<=j2;i++,j++)
a[i]=temp[j];
}
```

/*36) Take 10 integer input from user and sort them using ii) Selection Sort */

```
#include<stdio.h>

int main()
{
   int i,j,n,loc,temp,min,a[30];
   printf("Enter the number of elements:");
   scanf("%d",&n);
   printf("\nEnter the elements\n");

   for(i=0;i<n;i++)
   {
      scanf("%d",&a[i]);
   }

   for(i=0;i<n-1;i++)
   {
      min=a[i];
      loc=i;
      for(j=i+1;j<n;j++)
      {
         if(min>a[j])
         {
            min=a[j];
            loc=j;
         }
      }

      temp=a[i];
      a[i]=a[loc];
```

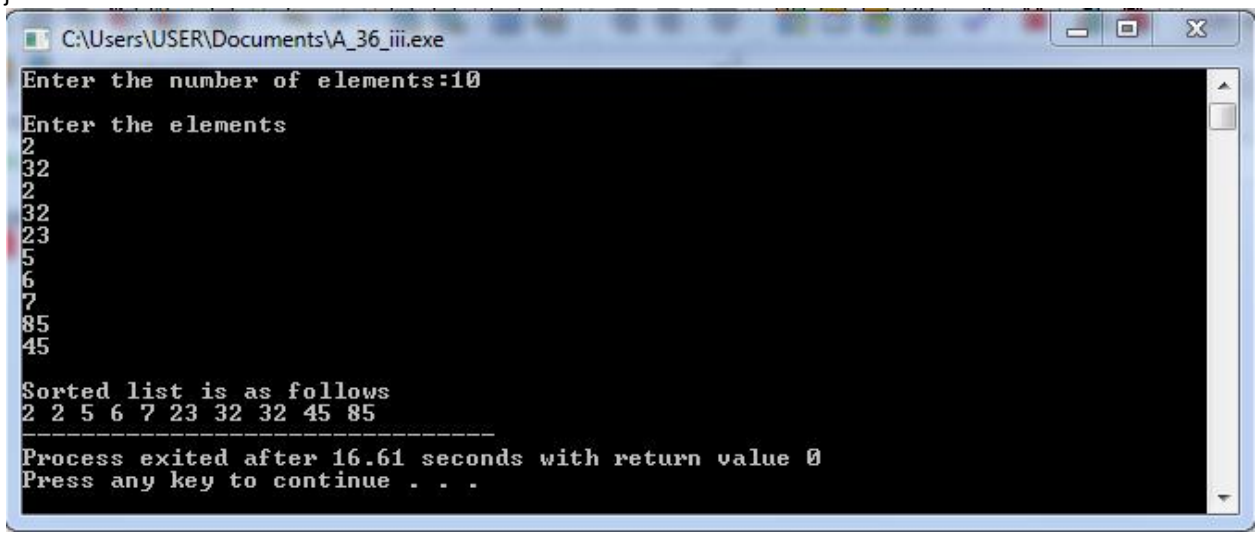
```
        a[loc]=temp;
    }

    printf("\nSorted list is as follows\n");
    for(i=0;i<n;i++)
    {
        printf("%d ",a[i]);
    }

    return 0;
}
```



36) Take 10 integer input from user and sort them using iii) Insertion Sort

```
#include<stdio.h>

int main()
{
    int i,j,n,temp,a[30];
    printf("Enter the number of elements:");
    scanf("%d",&n);
    printf("\nEnter the elements\n");

    for(i=0;i<n;i++)
    {
        scanf("%d",&a[i]);
    }

    for(i=1;i<=n-1;i++)
    {
        temp=a[i];
        j=i-1;
```

```
    while((temp<a[j])&&(j>=0))
    {
       a[j+1]=a[j];    //moves element forward
       j=j-1;
    }

    a[j+1]=temp;    //insert element in proper place
  }

  printf("\nSorted list is as follows\n");
  for(i=0;i<n;i++)
  {
    printf("%d ",a[i]);
  }

  return 0;
}
```



/*37) Suppose we have 6 students with roll no 1,2,3,4,5,6 respectively and we want to take the quiz numbers of these students as input and then print those numbers using 2D array.

Sample input

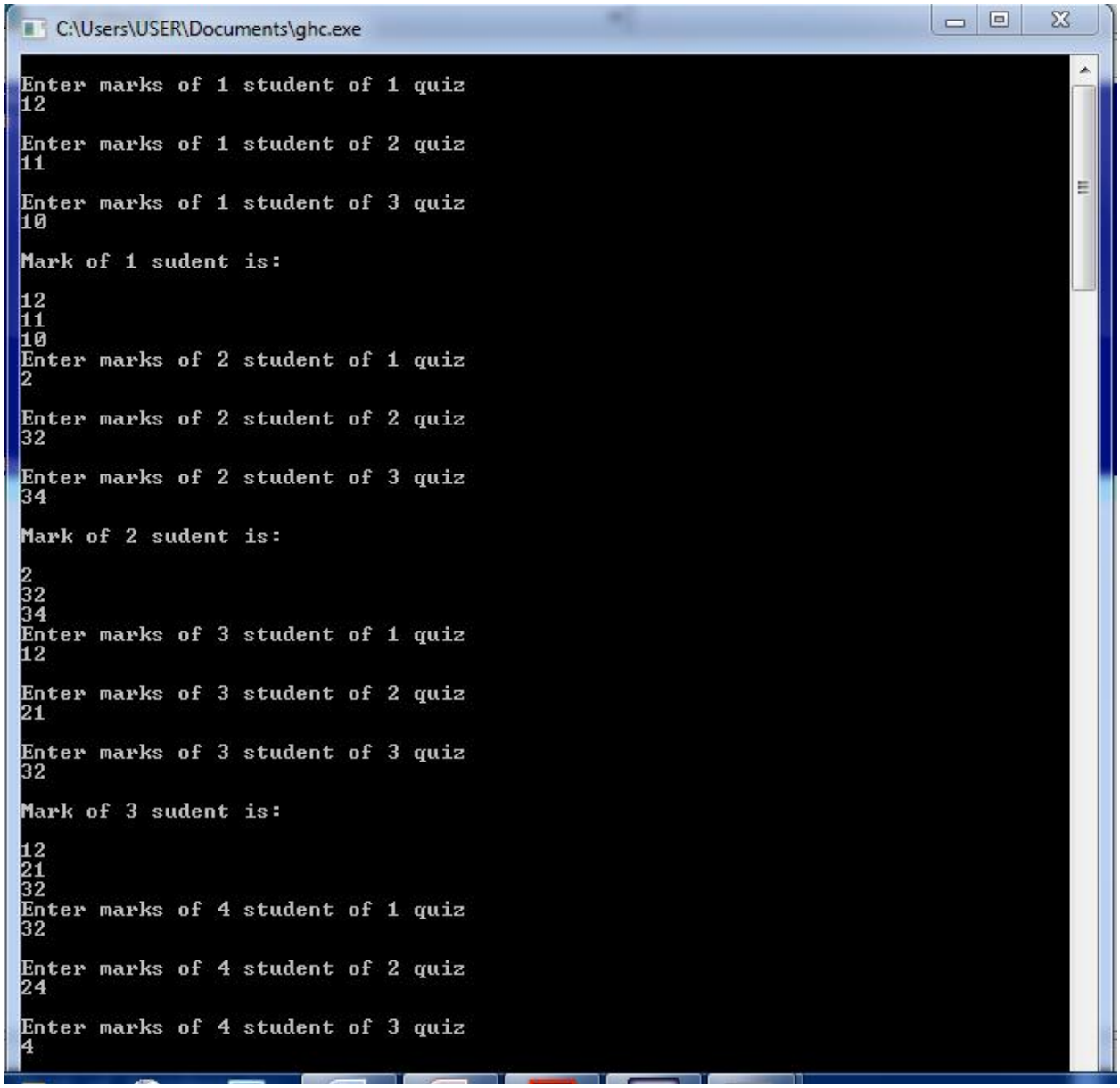
```
Enter Quiz number of roll 1:
12 11 10
Enter Quiz number of roll 2:
13 10 11
Enter Quiz number of roll 3:
14 13 9
Enter Quiz number of roll 4:
11 15 8 Roll 4 is 11 15 8
```

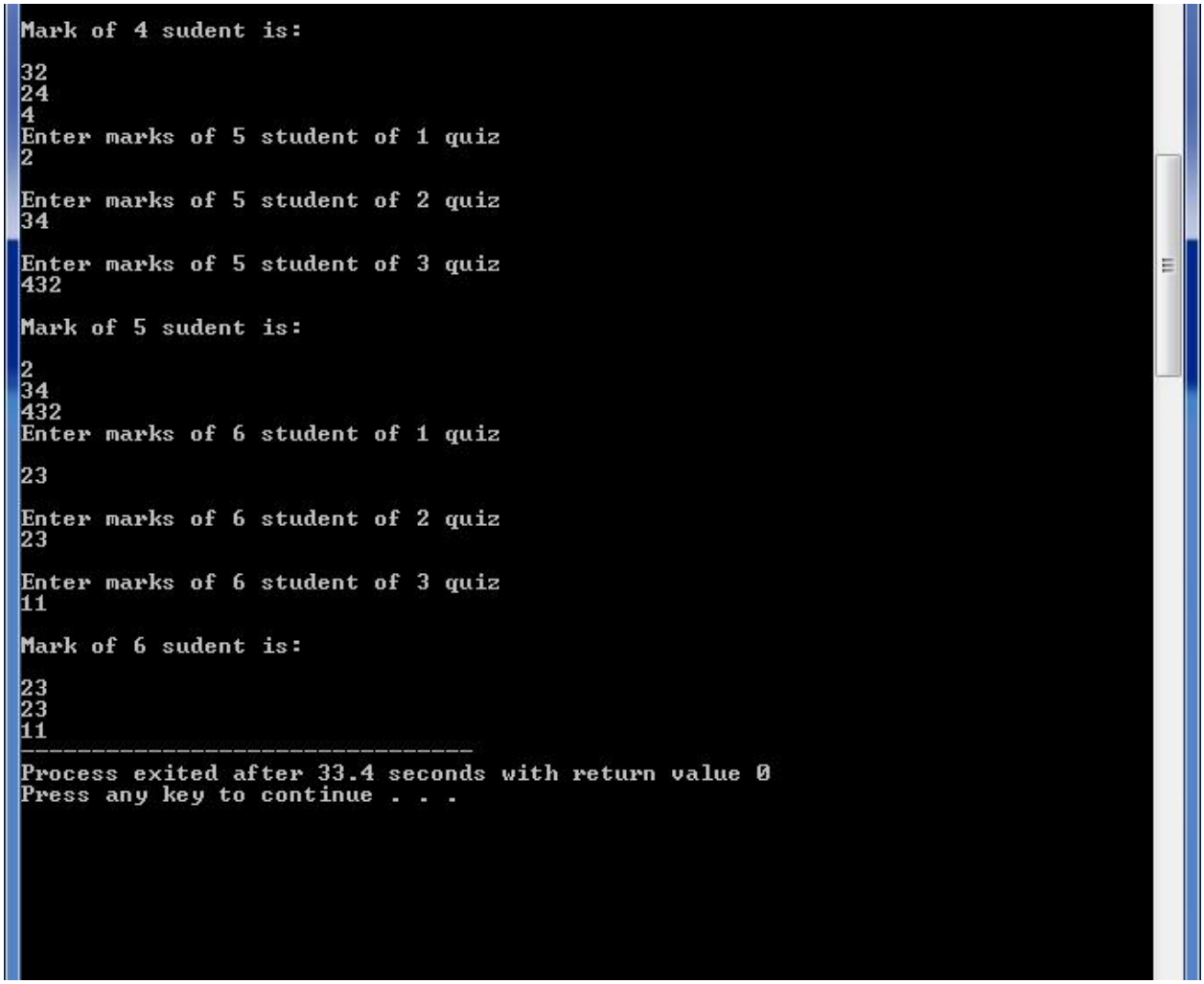
Sample output

```
The quiz marks of
Roll 1 is 12 11 10
Roll 2 is 13 10 11
Roll 3 is 14 13 9
*/
```

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

```
{
	int student[6][3];
	int i,j;
	for(i=0;i<6;i++){
		for(j=0;j<3;j++){
			printf("\nEnter marks of %d student of %d quiz\n",i+1,j+1);
			scanf("%d",&student[i][j]);
		}
		printf("\nMark of %d sudent is:\n",i+1);
		for(j=0;j<3;j++){
			printf("\n%d\t",student[i][j]);
		}
			}
return 0;
}
```


C:\Users\USER\Documents\ghc.exe
Enter marks of 1 student of 1 quiz
12
Enter marks of 1 student of 2 quiz
11
Enter marks of 1 student of 3 quiz
10
Mark of 1 sudent is:
12
11
10
Enter marks of 2 student of 1 quiz
2
Enter marks of 2 student of 2 quiz
32
Enter marks of 2 student of 3 quiz
34
Mark of 2 sudent is:
2
32
34
Enter marks of 3 student of 1 quiz
12
Enter marks of 3 student of 2 quiz
21
Enter marks of 3 student of 3 quiz
32
Mark of 3 sudent is:
12
21
32
Enter marks of 4 student of 1 quiz
32
Enter marks of 4 student of 2 quiz
24
Enter marks of 4 student of 3 quiz
4


Mark of 4 sudent is:
32
24
4
Enter marks of 5 student of 1 quiz
2
Enter marks of 5 student of 2 quiz
34
Enter marks of 5 student of 3 quiz
432
Mark of 5 sudent is:
2
34
432
Enter marks of 6 student of 1 quiz
23
Enter marks of 6 student of 2 quiz
23
Enter marks of 6 student of 3 quiz
11
Mark of 6 sudent is:
23
23
11
Process exited after 33.4 seconds with return value 0
Press any key to continue . . .

38) Suppose you are going to count the number of people of an area. The area is divided into 2 sectors, an each sector has 3 houses in them. Your job is to visit each sector and each house and take the number of people as input and print the number of people in each sector. Also print the total number of people in all the sectors. Area description has been given below with people in each house.

Area

Sector 1		
House 1 People:7	House 2 People:6	House 3 People:5
Sector 2		
House 1 People:2	House 2 People:5	House 3 People:3

Sample input

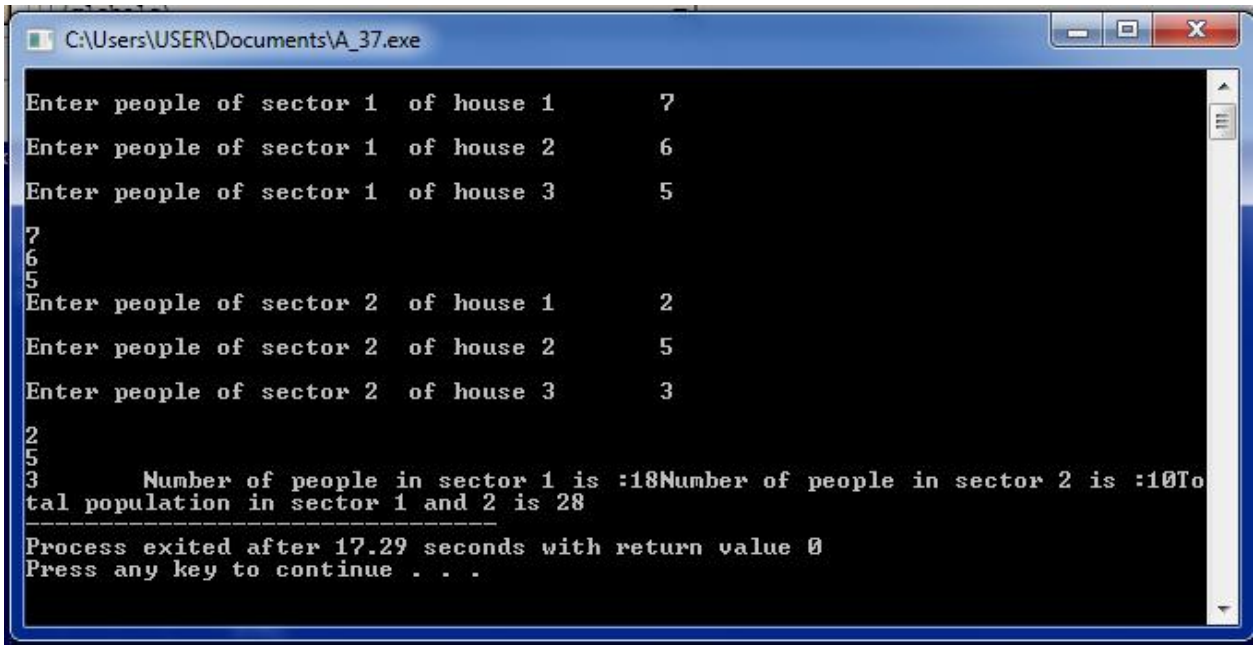
```
Enter People of Sector 1 House 1:
7
Enter People of Sector 1 House 2:
6
Enter People of Sector 1 House 3:
5

Enter People of Sector 2 House 1:
2
Enter People of Sector 2 House 2:
5
Enter People of Sector 2 House 3:
3
```

Sample output

```
Number of people in sector 1 is: 18

Number of people in sector 2 is: 10
Total number of people is sector 1 and 2 is : 28
```

```
#include<stdio.h>

int main()

{

        int area[2][3];

        int i,j,k,l;

        for(i=0;i<2;i++){

                for(j=0;j<3;j++){

                        printf("\nEnter people of sector %d  of house %d      ",i+1,j+1);

                        scanf("%d",&area[i][j]);

                }


                for(j=0;j<3;j++){

                        printf("\n%d\t",area[i][j]);
```

```
                }
                        }
                        l=0;
                        for(i=0;i<2;i++){
                       k=0;
                        for(j=0;j<3;j++){
                        k=area[i][j]+k;


                }
                l=l+k;
                printf("Number of people in sector %d is :%d",i+1,k);
        }
        printf("Total population in sector 1 and 2 is %d ",l);
return 0;
}
```



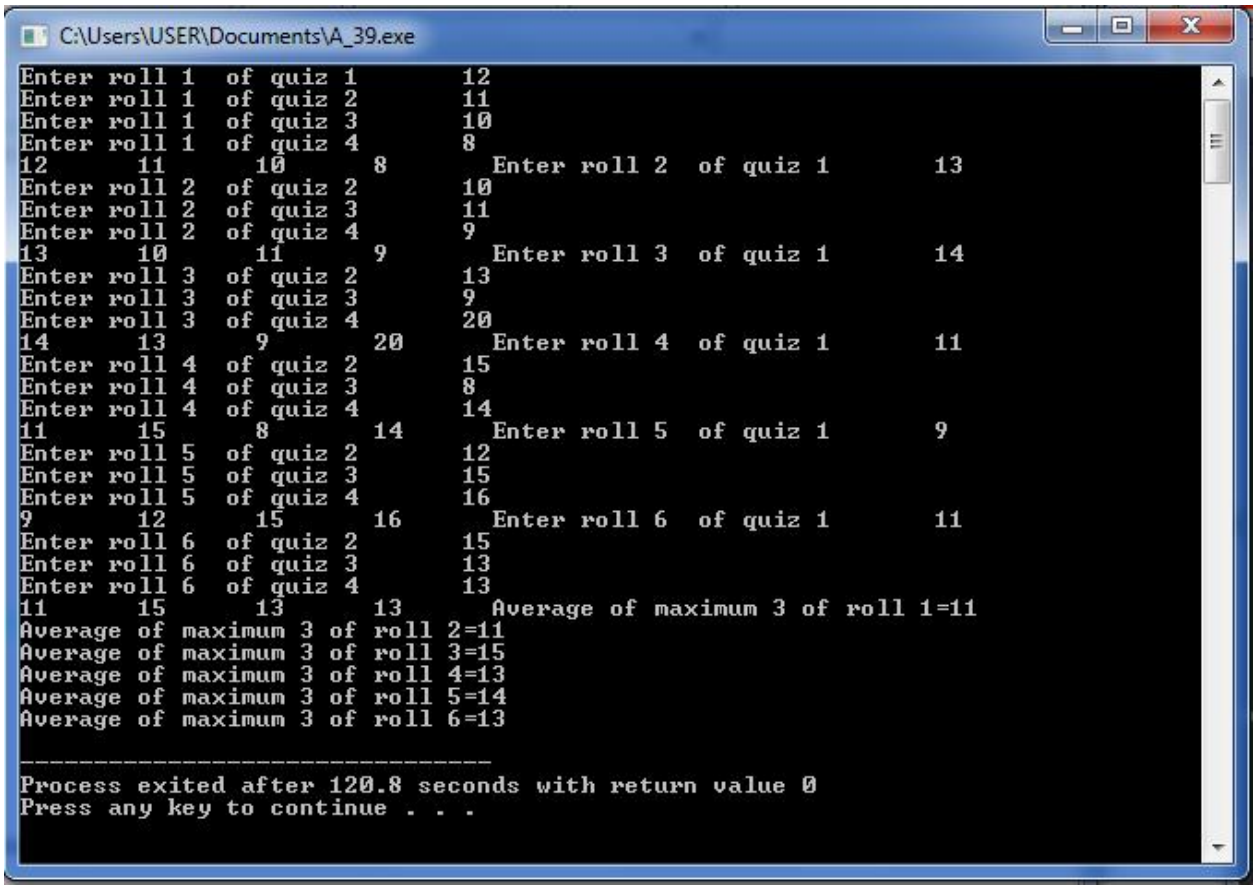
39) Suppose we have 6 students with roll no 1,2,3,4,5,6 respectively and now we want to calculate the average quiz marks of these students. The marks of the students are as follows:

Roll	Quiz 1	Quiz 2	Quiz 3	Quiz 4
1	12	11	10	8
2	13	10	11	9
3	14	13	9	20
4	11	15	8	14
5	9	12	15	16
6	11	15	13	13

Now using 2D array represent the quiz numbers of each students and calculate the average quiz marks (take only the best 3 quiz out of 4 quiz)for each of the students and print them accordingly.

```
#include<stdio.h>

int main()

{

        int student[6][4];

        int i,j,k,min,avg;

        for(i=0;i<6;i++){

                for(j=0;j<4;j++){

                        printf("Enter roll %d  of quiz %d      ",i+1,j+1);

                        scanf("%d",&student[i][j]);

                }


                for(j=0;j<4;j++){

                        printf("%d\t",student[i][j]);

                }

                        }

                        for(i=0;i<6;i++){

                                min=student[i][0];

                       k=0;

                        for(j=0;j<4;j++){
```

```
                k=student[i][j]+k;
                if(min>student[i][j])
                min=student[i][j];
            }
            printf("Average of maximum 3 of roll %d=%d\n",i+1,(k-min)/3);
}
return 0;
}
```

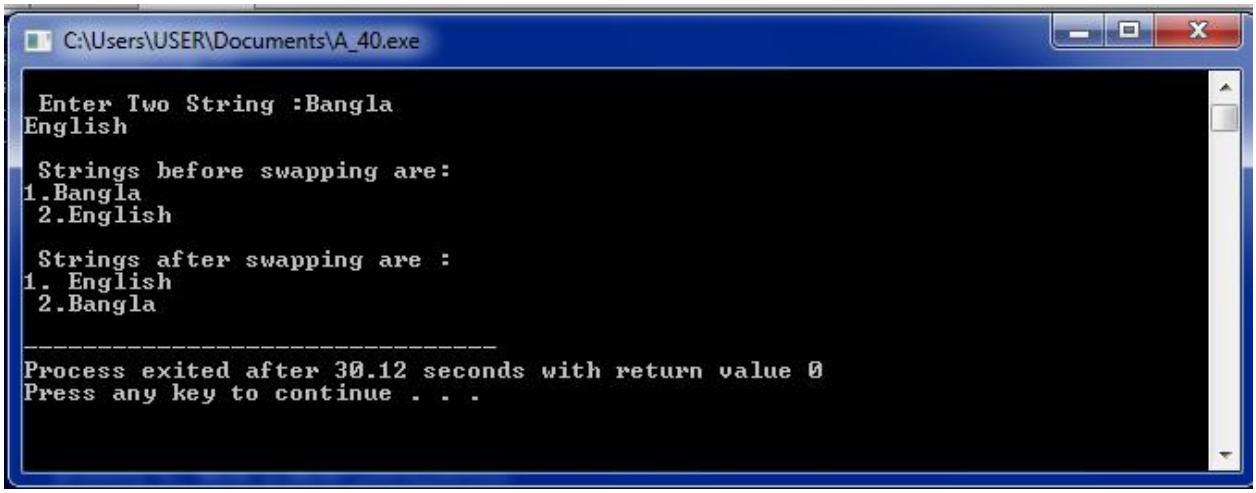


String

40) Take two string input from user and swap them.

Sample input	Sample output
Insert string 1: Bangla	After swapping
Insert string 2: English	String 1: English
	String 2: Bangla

```
#include<stdio.h>
#include<string.h>
#include<conio.h>
int main()
{
        char str1[25],str2[25],t[25];
        printf("\n Enter Two String :");
        scanf("%s %s",str1,str2);
        printf("\n Strings before swapping are:\n");
        printf("1.%s\n 2.%s\n",str1,str2);

        strcpy(t,str1);
        strcpy(str1,str2);
        strcpy(str2,t);

        printf("\n Strings after swapping are :\n");
        printf("1. %s\n 2.%s\n",str1,str2);

        return 0;
}
```



41) Take two string input from user and join them.

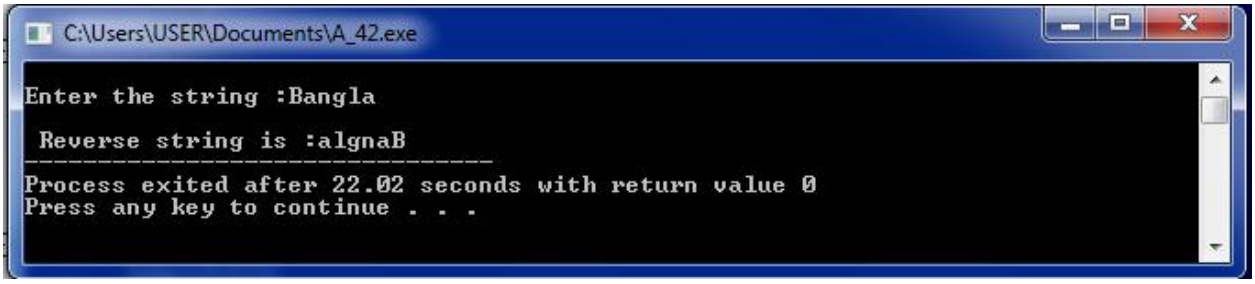
Sample input	Sample output
Insert string 1: Bangla	After joining
Insert string 2: desh	String : Bangladesh

```
#include<stdio.h>

#include<string.h>

#include<conio.h>

int main()

{

        char str1[25],str2[25],u[50];

        printf("\n Enter Two String :");

        scanf("%s %s",str1,str2);


printf("After joining=%s",strcat(str1,str2));


return 0;

}
```

42) Take a string input from user and reverse it without using strrev() function.

Sample input	Sample output
Insert string : Bangla	algnaB

```
#include<stdio.h>
#include<string.h>
int main()
{
	char str[100],temp;
	int i,j=0;
	printf("\nEnter the string :");
	gets(str);
	i=0;
	j=strlen(str)-1;
	while(i<j){
		temp=str[i];
		str[i]=str[j];
		str[j]=temp;
		i++;
		j--;
	}
	printf("\n Reverse string is :%s",str);
	return 0;
}
```

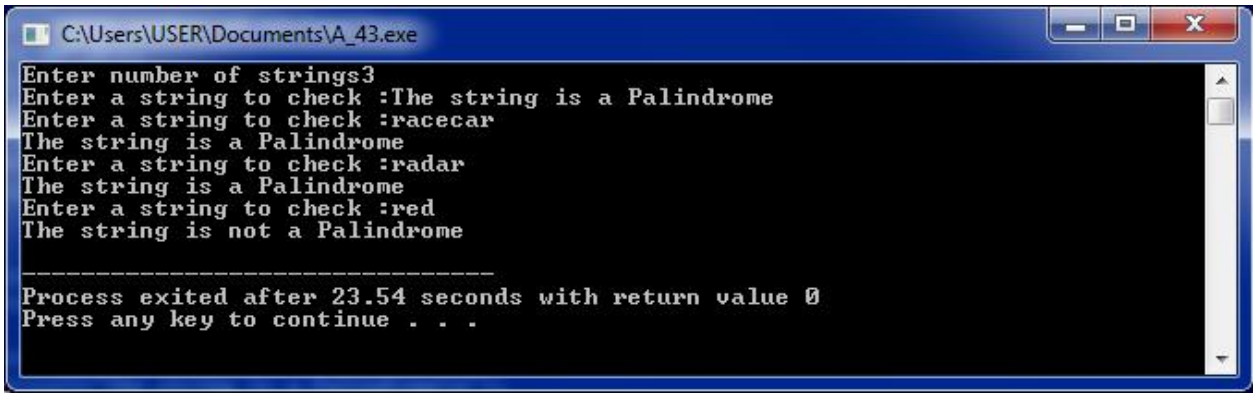


43) Take N string input from user and check whether it is a palindrome or not. (Firstly the user enters an integer number as input, which represents the numbers of string that is going to be entered later)

Sample input	Sample output
3	
Racecar	Racecar is a palindrome.
Radar	Radar is a palindrome.
Red	Red is not a palindrome.

```
#include <stdio.h>

#include <string.h>


int main() {

        int k,n;

        printf("Enter number of strings");

        scanf("%d",&n);

        for(k=0;k<=n;k++){


        char a[100],b[100];

        printf("Enter a string to check :");

   gets(a);



        strcpy(b,a);

        strrev(b);
```

```
        if(strcmp(a, b) == 0) {
                printf("The string is a Palindrome\n");
        }
         else {
                printf("The string is not a Palindrome\n");
        }
}
        return 0;
}
```

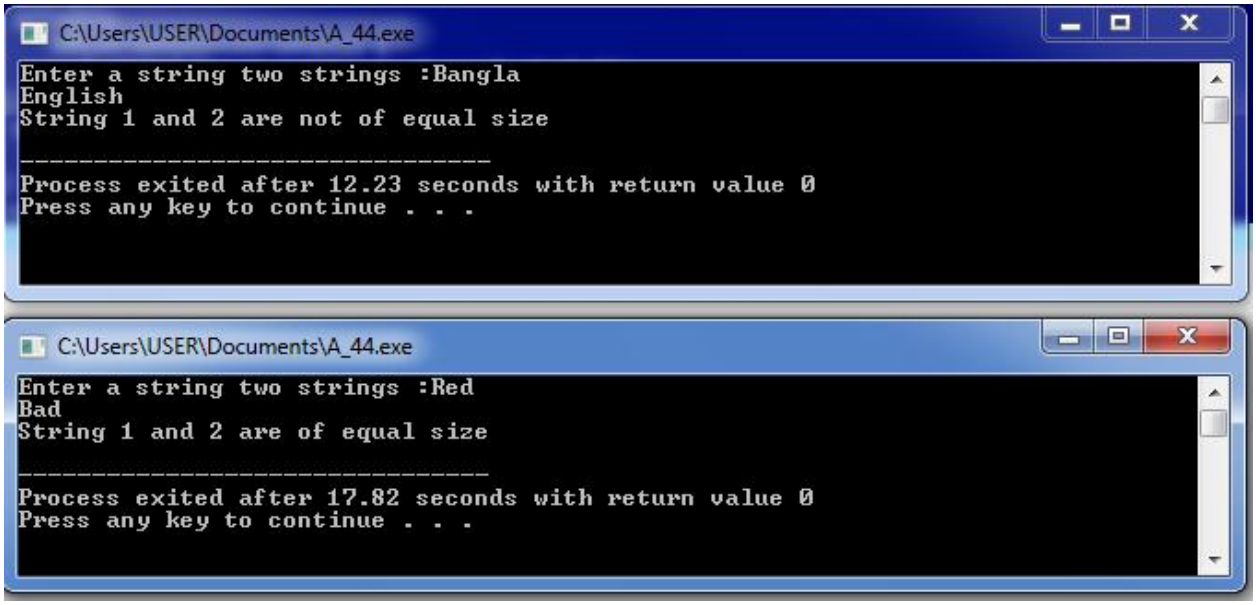


44) Take two input from user and check whether they are of same size.

Sample input	Sample output
Insert string 1: Bangla Insert string 2: English	String 1 and String 2 are not of same size
Insert string 1: Red Insert string 2: Bad	String 1 and String 2 are of same size

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

int main() {
        char a[100],b[100];
        printf("Enter a string two strings :");
```

```
    gets(a);
    gets(b);
        if(strlen(a)==strlen(b)) {
            printf("String 1 and 2 are of equal size\n");
        }
        else {
            printf("String 1 and 2 are not of equal size\n");
        }
        return 0;
}
```



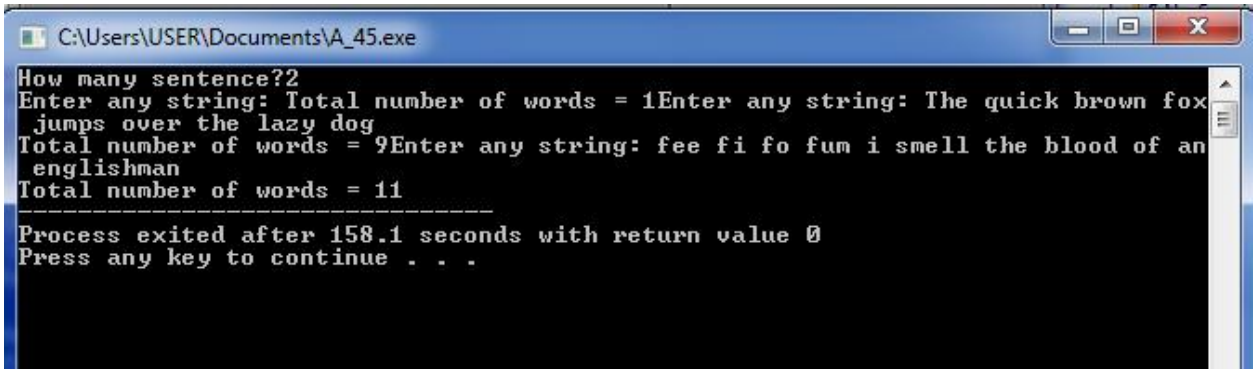
45) Take N sentence as input and count the number of words in it. (N <=10)

Sample input	Sample output
N = 2	
The quick brown fox jumps over the lazy dog	Number of word: 9
Fee fi fo fum I smell the blood of an Englishman	Number of word: 11

```
#include <stdio.h>

#define MAX_SIZE 100 // Maximum string size
```

```
int main()
{   int w,n;
     printf("How many sentence?");
     scanf("%d",&n);
    for(w=0;w<=n;w++){

   char str[MAX_SIZE];
   int i, words;

   /* Input string from user */
   printf("Enter any string: ");
   gets(str);

   i = 0;
   words = 1;

   /* Runs a loop till end of string */
   while(str[i] != '\0')
   {
      /* If the current character(str[i]) is white space */
      if(str[i]==' ' || str[i]=='\n' || str[i]=='\t')
      {
         words++;
      }

      i++;
   }
```

```
    printf("Total number of words = %d", words);
}
    return 0;
}
```



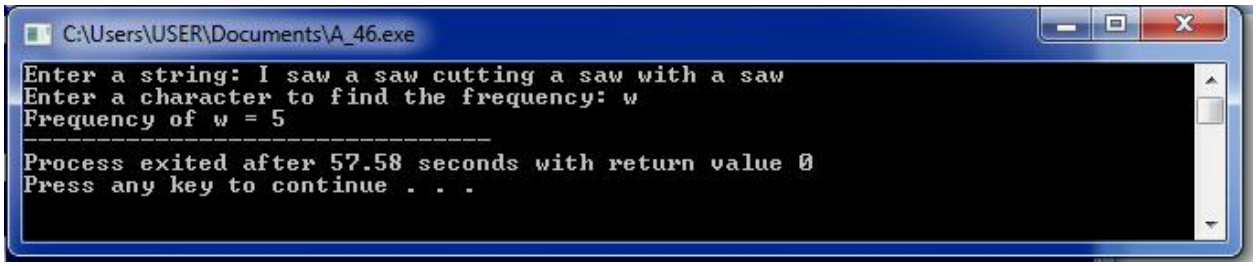
46) Take a sentence and a character as input from user and then find out the number of occurrence of that character in that sentence.

Sample input
Sentence: I saw a saw cutting a saw with a saw
Character: w

Sample output
Frequency of w = 5

```
#include <stdio.h>


int main()
{
  char str[1000], ch;
  int i, frequency = 0;


  printf("Enter a string: ");
  gets(str);


  printf("Enter a character to find the frequency: ");
  scanf("%c",&ch);


  for(i = 0; str[i] != '\0'; ++i)
```

```
  {
     if(ch == str[i])
        ++frequency;
  }

  printf("Frequency of %c = %d", ch, frequency);

  return 0;
}
```

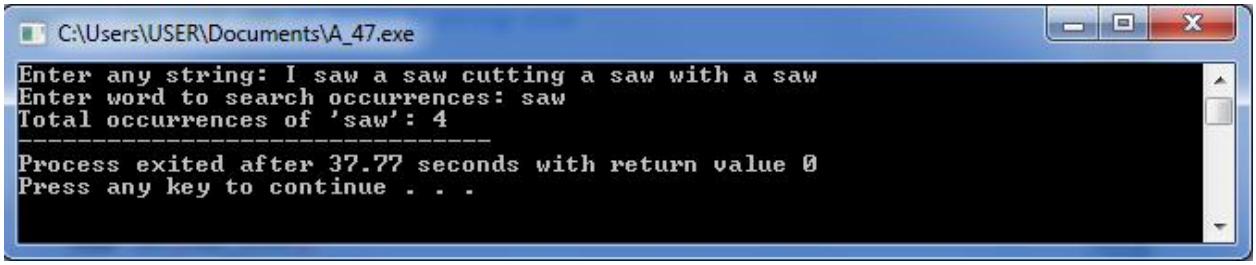


47) Take a sentence and a word as input from user and then find out the number of occurrence of that word in that sentence

Sample input	Sample output
Sentence: I saw a saw cutting a saw with a saw	
Word: saw	Frequency of saw = 4

```
#include <stdio.h>
#include <string.h>
#define MAX_SIZE 100 // Maximum string size

/* Function declaration */
int countOccurrences(char * str, char * toSearch);


int main()
{
   char str[MAX_SIZE];
   char toSearch[MAX_SIZE];
   int count;

   /* Input string and word from user */
   printf("Enter any string: ");
```

```
    gets(str);
    printf("Enter word to search occurrences: ");
    gets(toSearch);

    count = countOccurrences(str, toSearch);

    printf("Total occurrences of '%s': %d", toSearch, count);

    return 0;
}


/**
 * Get, total number of occurrences of a word in a string
 */
int countOccurrences(char * str, char * toSearch)
{
    int i, j, found, count;
    int stringLen, searchLen;

    stringLen = strlen(str);      // length of string
    searchLen = strlen(toSearch); // length of word to be searched

    count = 0;

    for(i=0; i <= stringLen-searchLen; i++)
    {
        /* Match word with string */
        found = 1;
        for(j=0; j<searchLen; j++)
        {
            if(str[i + j] != toSearch[j])
            {
                found = 0;
                break;
            }
        }

        if(found == 1)
        {
            count++;
        }
    }

    return count;
}
```

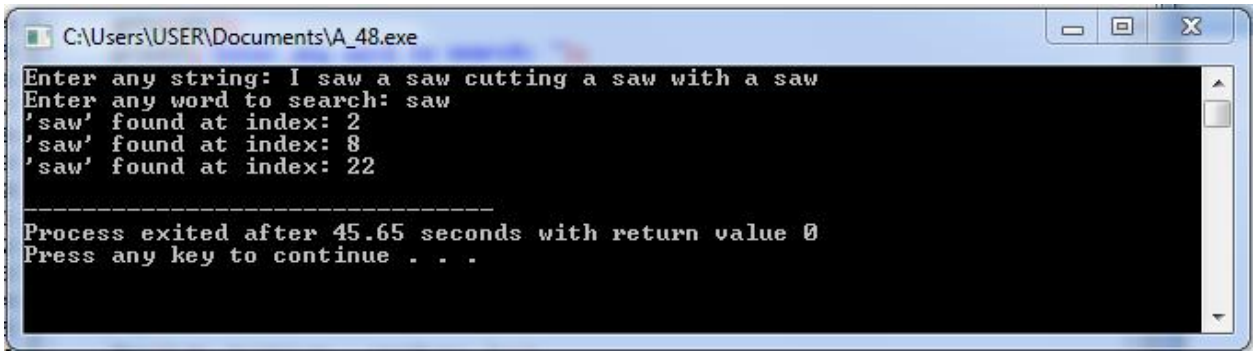


48) Take a sentence and a word as input from user and then find out whether the word is present in that sentence and if it does than print the location of its occurrence.

Sample Input	Sample Output
Sentence: I saw a saw cutting a saw with a saw	
Word: saw	Saw is present at position: 3 9 23 34

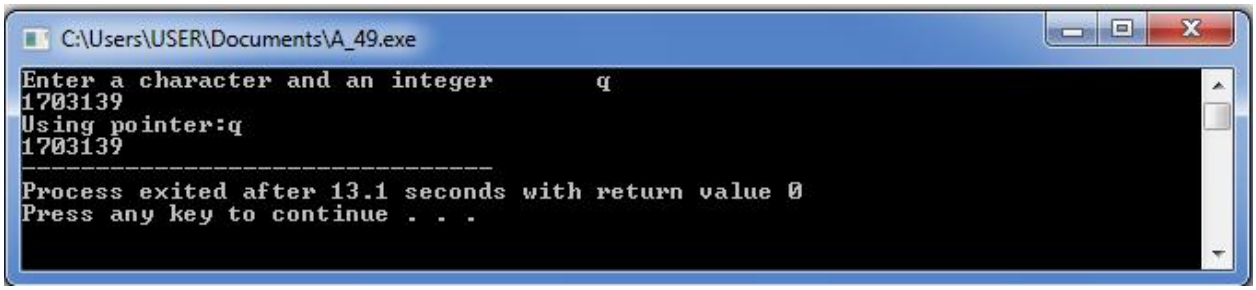
```
#include <stdio.h>
#include <string.h>
#define MAX_SIZE 100 // Maximum string size

int main()
{
   char str[MAX_SIZE];
   char word[MAX_SIZE];
   int i, j, found;
   int strLen, wordLen;

   /* Input string and word from user */
   printf("Enter any string: ");
   gets(str);
   printf("Enter any word to search: ");
   gets(word);

   strLen  = strlen(str);  // Find length of string
   wordLen = strlen(word); // Find length of word


   /*
    * Run a loop from starting index of string to
    * length of string - word length
    */
   for(i=0; i<strLen - wordLen; i++)
   {
      // Match word at current position
      found = 1;
      for(j=0; j<wordLen; j++)
      {
         // If word is not matched
         if(str[i + j] != word[j])
         {
```

```
            found = 0;
            break;
          }
        }

        // If word have been found then print found message
        if(found == 1)
        {
          printf("'%s' found at index: %d \n", word, i);
        }
      }

      return 0;
}
```



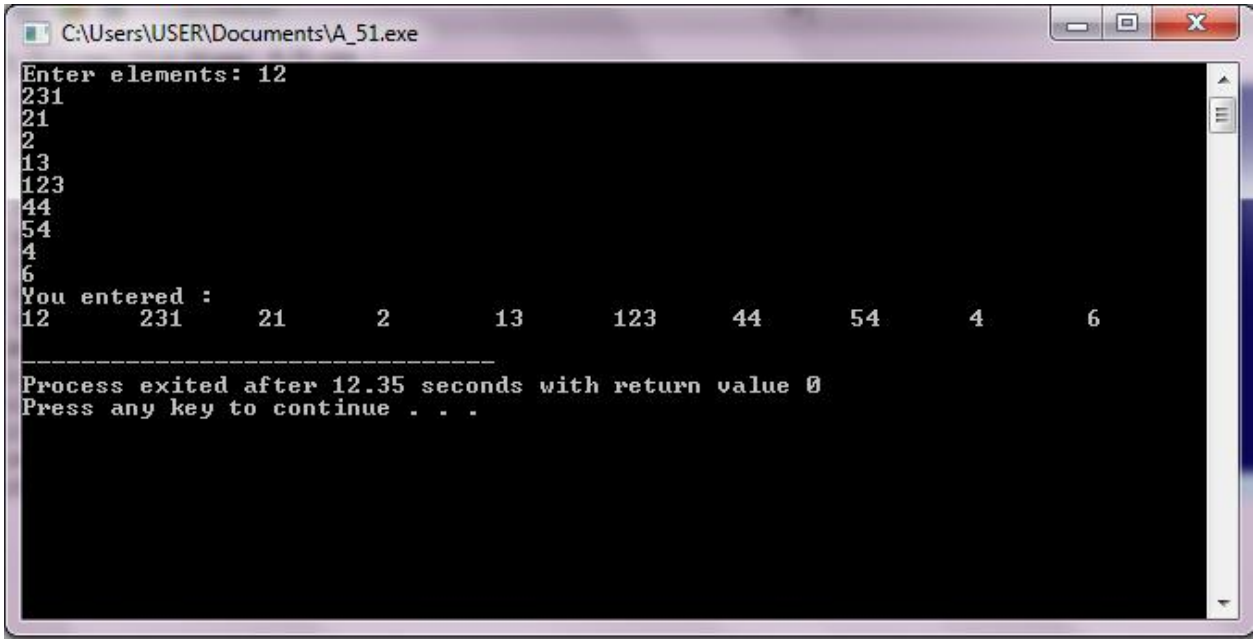
49) Take one character and one integer input from user and print them using pointer

```
#include<stdio.h>

#include<conio.h>

int main()

{   int a,*p;

    char ch,*c;

          printf("Enter a character and an integer      ");

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

          p=&a;

          c=&ch;

          printf("Using pointer:%c \n%d",*c,*p);

          return 0;

}
```



50) Take 10 integer input from user and put them into array then print those number using Pointer

```
#include<stdio.h>


int main()

{

	int data[10], i,t,avg;

	printf("Enter elements: ");

	for(i=0;i<10;++i)

	scanf("%d",data+i);


	printf("You entered :\n");

	for(i=0;i<10;++i){

		printf("%d\t",*(data+i));

	}

return 0;

}
```



51) Take 10 integer input from user and put them into array then calculate the average of all the even numbers while using pointer to access the array.

```
#include<stdio.h>
int main()
{
	int n,j=0,i,*p;
	float sum=0,avg;
	printf("How many  :");
	scanf("%d",&n);
	int a[n];
	printf("Enter them");
	for(i=0;i<n;i++)
	{
	scanf("%d",&a[i]);
	p=&a[i];                    /*Using pointer */
	if((a[i]%2)==0)
	{
		j++;
		sum=sum+(*p);    /*Using pointer */
	}
}
avg=sum/j;
printf("%f",avg);
return 0;
}
```

52) Take two integer input from user and calculate the sum of those input using function.

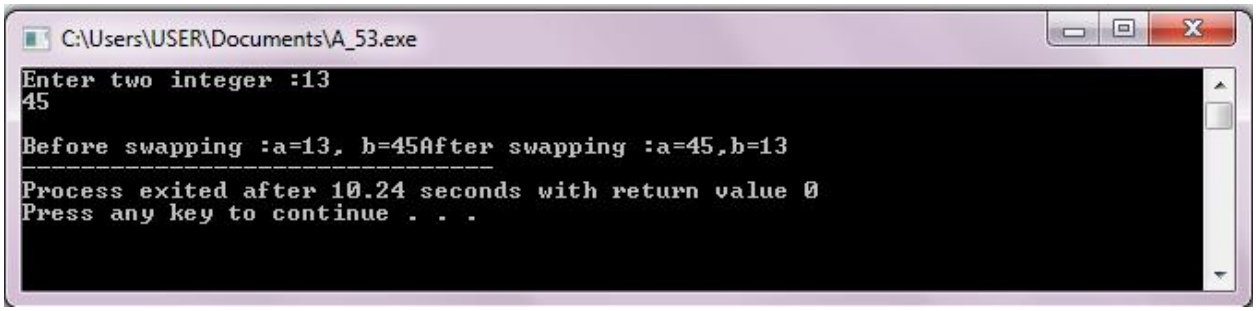
```
#include<stdio.h>
int sum(int num1, int num2) {
  int num3;
  num3 = num1 + num2;
  return (num3);
}

int main() {
  int num1, num2, total;

  printf("\nEnter the two numbers : ");
  scanf("%d %d", &num1, &num2);

  //Call Function Sum With Two Parameters
  total = sum(num1, num2);

  printf("nAddition of two number is : %d ",total);
  return (0);
```

}

53) Take two integer input from user and swap them by passing pointer to a function.

```
#include<stdio.h>

#include<conio.h>


void swap(int *pa,int *pb);


int main()

{

        int a,b;

        printf("Enter two integer :");

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

        printf("\nBefore swapping :a=%d, b=%d",a,b);

        swap(&a,&b);

        printf("After swapping :a=%d,b=%d",a,b);

        return 0;

}


void swap(int *pa,int *pb)

{

        int t;

        t=*pa;
```

```
        *pa=*pb;
        *pb=t;
}
```



54) Take 10 integer input from user into an array and print them using a function.

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

void display(int x[]);

int main()
{
int a[10],i;
printf("Enter ten integers");
for(i=0;i<10;i++){
scanf("%d",&a[i]);
}
display(a);

return 0;
}

void display(int x[])
```

```
{
int i;
printf("\nYou entered :");
for(i=0;i<10;i++)
{
printf("%d\t\t",x[i]);
}
```

55) Take 10 integer input from user into an array and calculate their summation and average using a function.

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

void display(int x[]);

int main()
{
int a[10],i;
printf("Enter ten integers");
for(i=0;i<10;i++){
scanf("%d",&a[i]);
}
display(a);

return 0;
}

void display(int x[])
{
```

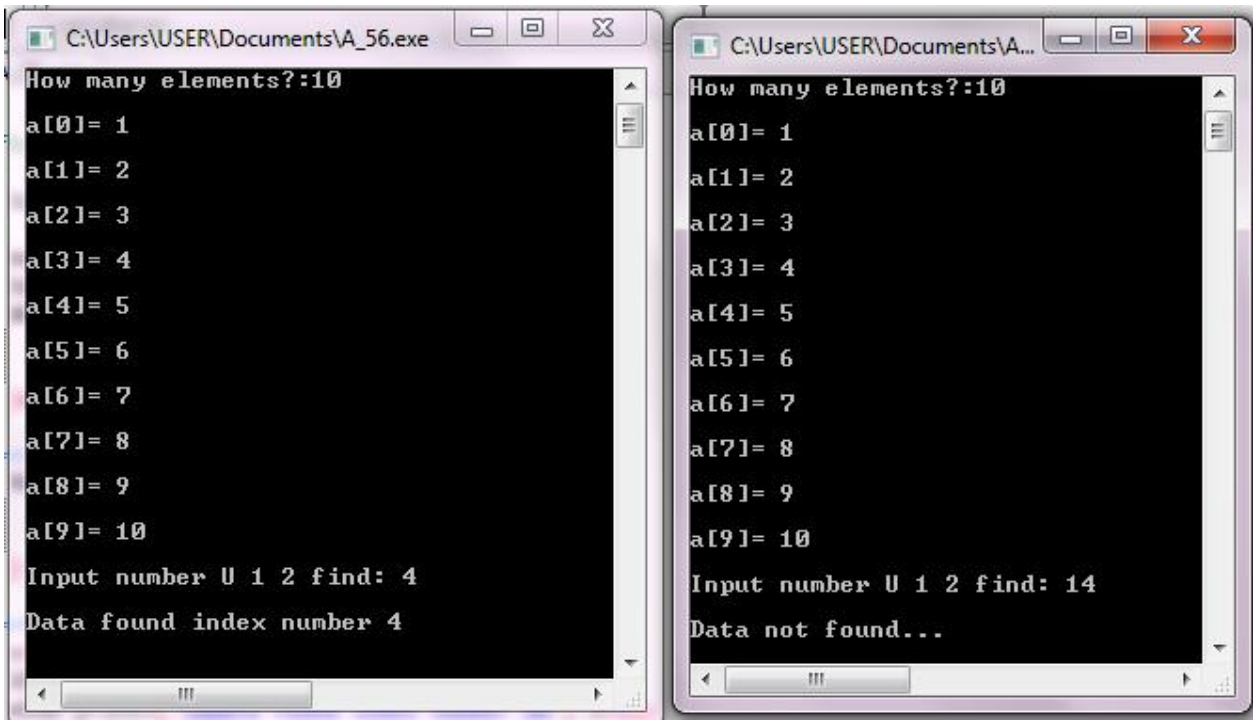
```
int i,j=0;


for(i=0;i<10;i++)

{

j=j+x[i];

}

printf("Sum=%d",j);

printf("Avg=%f",j/10.0);

}
```

56) Write code to create a function search() that can find any number within a given array and print the array index where it exists.
Sample input Sample output
Enter 10 integer : Your number 10 exists at index 10
1 2 3 4 5 6 7 8 9 10
Enter the number you want to search: 10
Enter 10 integer: Your number 4 exists at index 4
1 2 3 4 5 6 7 8 9 10
Enter the number you want to search: 4
Enter 10 integer : Your number 14 does not exist in the array
1 2 3 4 5 6 7 8 9 10
Enter the number you want to search: 14

```
#include <stdio.h>

#include<conio.h>


#define MAX_ELEMENT 20
```

```
int Sequential_search(int a[], int n);

int main(){
	int n, x, a[MAX_ELEMENT];
	do{
		printf("How many elements?:");
		scanf("%d",&n);
	}while(n<0||n>MAX_ELEMENT);

//==========input array
	for(int i=0;i<n;i++){
		printf("\na[%d]= ",i);
		scanf("%d",&a[i]);
	}

//==========search
	x=Sequential_search(a,n);
	if(x==-1) printf("\nData not found...");
	else printf("\nData found index number %d", x+1);

	getch();
}

//==========end main

int Sequential_search(int a[], int n){
	int find;
```

```
	printf("\nInput number U 1 2 find: ");
	scanf("%d", &find);
	for(int i=0;i<n;i++)
		if(a[i]==find)	return i;
	return -1;
}
```



57) Take an integer N input from user and calculate factorial on N using a function factorial(). (N<10).

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

long fact(long a);

int main()
{
	long n,f;
```

```
	printf("Enter the number :");
	scanf("%d",&n);

	f=fact(n);
	printf("\nFactorial=%d",f);

	return 0;
}

long fact(long a)
{
	long f=1;
	int i;
	for(i=1;i<=a;i++)
	{
		f=f*i;
	}
	return f;
}
```

58) Take integer N and R as input from user (Where N>R) and calculate NcR of those number using function.

```
#include <stdio.h>

long factorial(int);
```

```
long find_ncr(int, int);
long find_npr(int, int);
int main()
{
  int n, r;
  long ncr, npr;
printf("Enter the value of n and r\n");
  scanf("%d%d",&n,&r);
ncr = find_ncr(n, r);
  npr = find_npr(n, r);

  printf("%dC%d = %ld\n", n, r, ncr);

  return 0;
}

long find_ncr(int n, int r) {
  long result;

  result = factorial(n)/(factorial(r)*factorial(n-r));

  return result;
}

long find_npr(int n, int r) {        /*For  understanding future problem*/
  long result;

  result = factorial(n)/factorial(n-r);
```

```
  return result;
}

long factorial(int n) {
  int c;
  long result = 1;

  for (c = 1; c <= n; c++)
    result = result*c;

  return result;
}
```

59) Take an integer N input from user and generate the Fibonacci series up to the N^{th} term using function fibo().

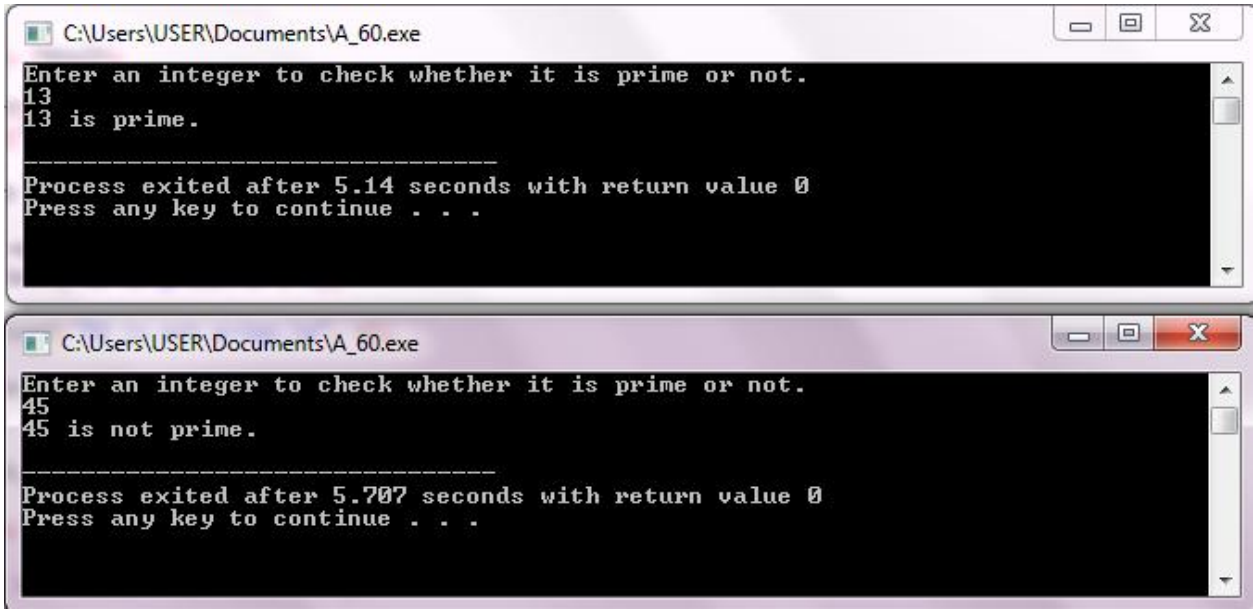
```
#include<stdio.h>
#include<conio.h>
int main()
{
        int n;
        void fibo(int n);
        printf("Enter a number: ");
```

```
	scanf("%d",&n);
	printf("Fibonacci Series\n0\n1\n");
	fibo(n);
	getch();
	return 0;
}
void fibo(int n)
{
	int a=0,b=1,c,i;
	for(i=1;i<=n-2;i++)
	{
		c=a+b;
		printf("%d\n",c);
		a=b;
		b=c;
	}
}
```

60) Take an integer N input from user and determine whether it is a prime number or not using function

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

```
int check_prime(int);

main()
{
  int n, result;

  printf("Enter an integer to check whether it is prime or not.\n");
  scanf("%d",&n);

  result = check_prime(n);

  if ( result == 1 )
    printf("%d is prime.\n", n);
  else
    printf("%d is not prime.\n", n);

  return 0;
}

int check_prime(int a)
{
  int c;

  for ( c = 2 ; c <= a - 1 ; c++ )
  {
    if ( a%c == 0 )
   return 0;
  }
  return 1;
}
```



61) Consider the following structure:
Point{
int x;
int y;
}
Now take inputs for two point A and B from user and calculate the distance between those two points

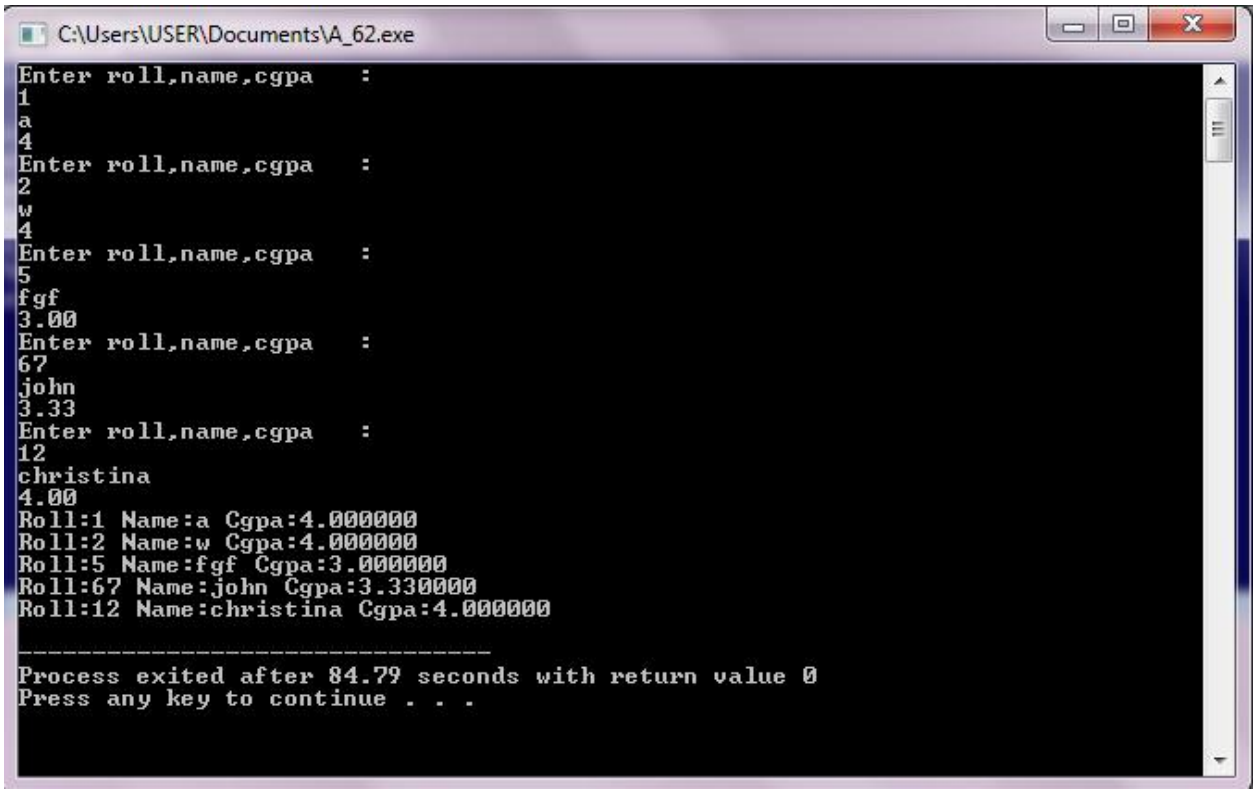
```
#include<stdio.h>

#include<conio.h>

#include<math.h>

struct Point{

int x;

int y;

}p1,p2;

int main(){

float d,temp;

printf("Enter x,y for point p1 :\n");

scanf("%d %d",&p1.x,&p1.y);

printf("Enter x,y for point p2 :\n");

scanf("%d %d",&p2.x,&p2.y);
```

```
temp=((p1.x-p2.x)*(p1.x-p2.x)*1.0)+((p1.y-p2.y)*(p1.y-p2.y)*1.0);

d=sqrt(temp);

printf("Distace between them=%f",d);

}
```

62) Consider the following structure:
student{
int roll;
char name[30];
float cgpa;
};
Now take input for 5 students into array of structure and print their information.

```
#include<stdio.h>


struct student{

int roll;

char name[30];

float cgpa;

}s[5];

int main(void)

{

        int i;

        for(i=0;i<5;i++){

                printf("Enter roll,name,cgpa   :\n");

                scanf("%d %s %f",&s[i].roll,&s[i].name,&s[i].cgpa);
```

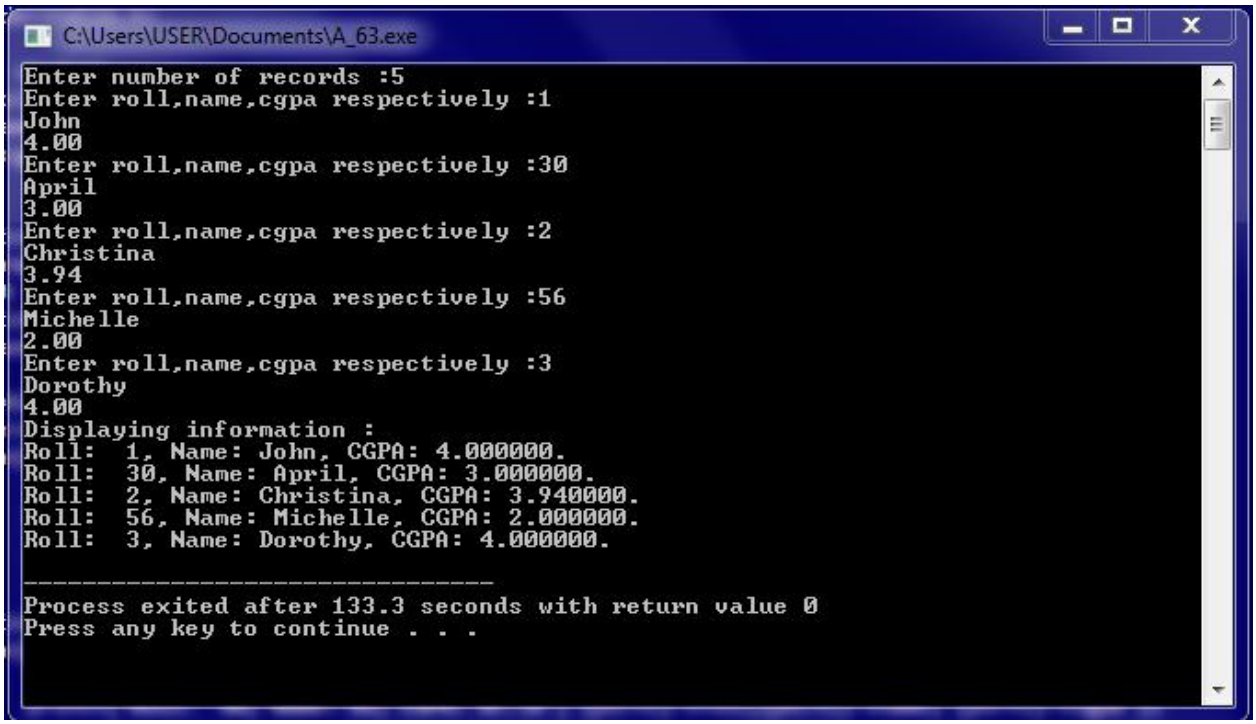
```
        }

        for(i=0;i<5;i++){
                printf("Roll:%d Name:%s Cgpa:%f\n",s[i].roll,s[i].name,s[i].cgpa);
        }
}
```



63) Consider the following structure:
student{
int roll;
char name[30];
float cgpa;
};
Now take information of 5 students using dynamic memory allocation into array of pointer of structure student and print their information.

```
#include<stdio.h>

#include<stdlib.h>
```

```
struct student
{int roll;
char name[30];
float cgpa;
};

int main(){
        struct student *ptr;
        int i,noOfRecords;
        printf("Enter number of records :");
        scanf("%d",&noOfRecords);

        /*Allocates the number of records */
        ptr=(struct student*) malloc (noOfRecords * sizeof(struct student));
        for(i=0;i<noOfRecords;++i)
        {
                printf("Enter roll,name,cgpa respectively :");
                scanf("%d %s %f", &(ptr+i)->roll,&(ptr+i)->name, &(ptr+i)->cgpa );
        }

        printf("Displaying information :\n");
        for(i=0;i<noOfRecords;++i)
        {
                printf("Roll:  %d, Name: %s, CGPA: %f.\n", (ptr+i)->roll,(ptr+i)->name, (ptr+i)-
>cgpa );
   }
}
```



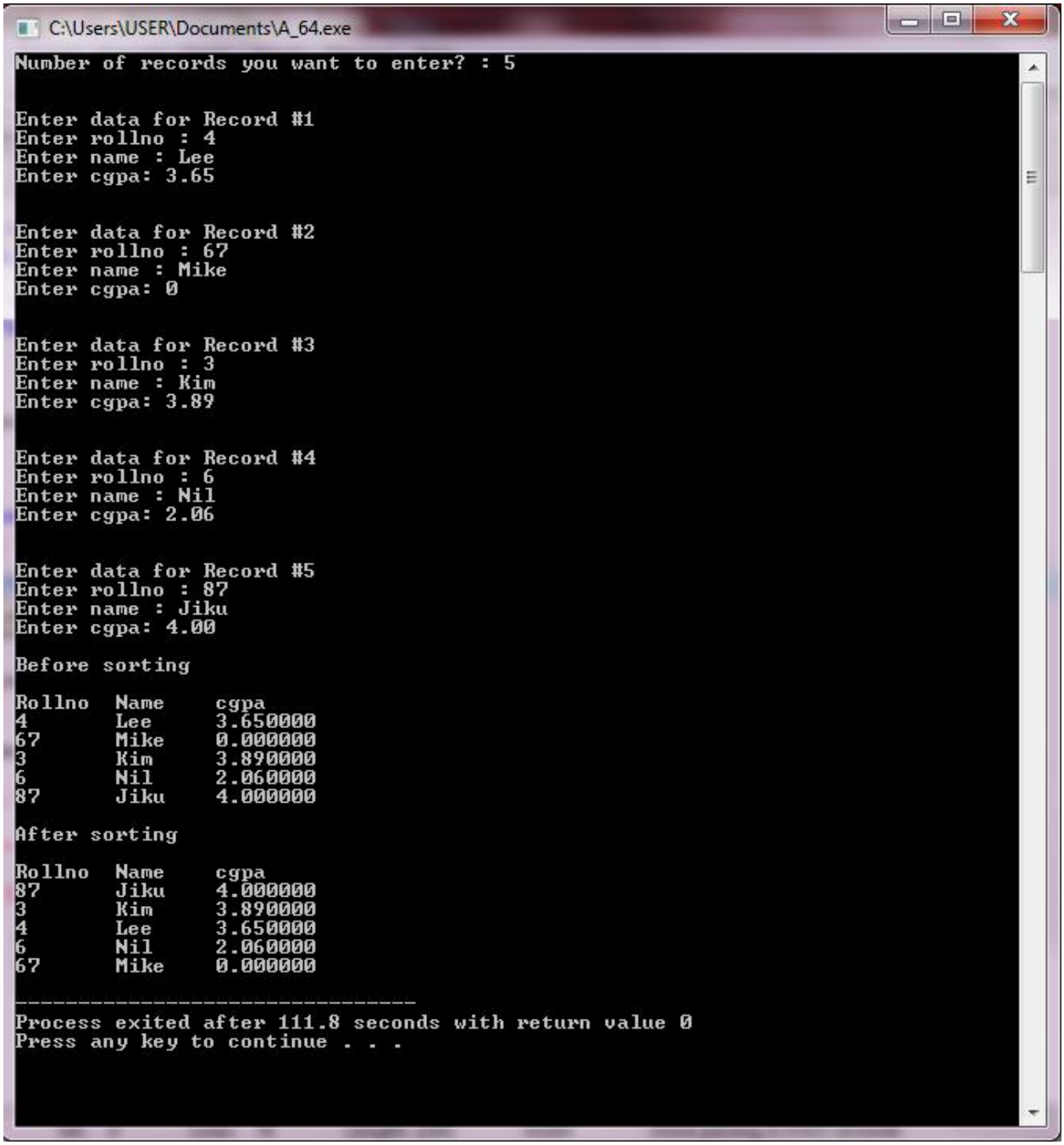
64) Consider the following structure:
student{
int roll;
char name[30];
float cgpa;
};
Now take information of 5 students using dynamic memory allocation into array of
pointer of structure student. Now sort this array based on the cgpa of the students in
descending order and print the sorted array accordingly

```
#include <stdio.h>


struct student

{

   int rollno;

   char name[80];

   float cgpa;
```

```
};

void accept(struct student list[], int s);
void display(struct student list[], int s);
void bsortDesc(struct student list[], int s);

int main()
{
   struct student data[20];
   int n;

   printf("Number of records you want to enter? : ");
   scanf("%d", &n);

   accept(data, n);
   printf("\nBefore sorting");
   display(data, n);
   bsortDesc(data, n);
   printf("\nAfter sorting");
   display(data, n);

   return 0;
}

void accept(struct student list[80], int s)
{
   int i;
   for (i = 0; i < s; i++)
```

```
    {
        printf("\n\nEnter data for Record #%d", i + 1);

        printf("\nEnter rollno : ");
        scanf("%d", &list[i].rollno);

        printf("Enter name : ");
       scanf("%s", &list[i].name);

        printf("Enter cgpa: ");
        scanf("%f", &list[i].cgpa);
    }
}

void display(struct student list[80], int s)
{
    int i;

    printf("\n\nRollno\tName\tcgpa\n");
    for (i = 0; i < s; i++)
    {
        printf("%d\t%s\t%f\n", list[i].rollno, list[i].name, list[i].cgpa);
    }
}

void bsortDesc(struct student list[80], int s)
{
    int i, j;
```

```
    struct student temp;


    for (i = 0; i < s - 1; i++)
    {
        for (j = 0; j < (s - 1-i); j++)
        {
            if (list[j].cgpa < list[j + 1].cgpa)
            {
                temp = list[j];
                list[j] = list[j + 1];
                list[j + 1] = temp;
            }
        }
    }
}
```



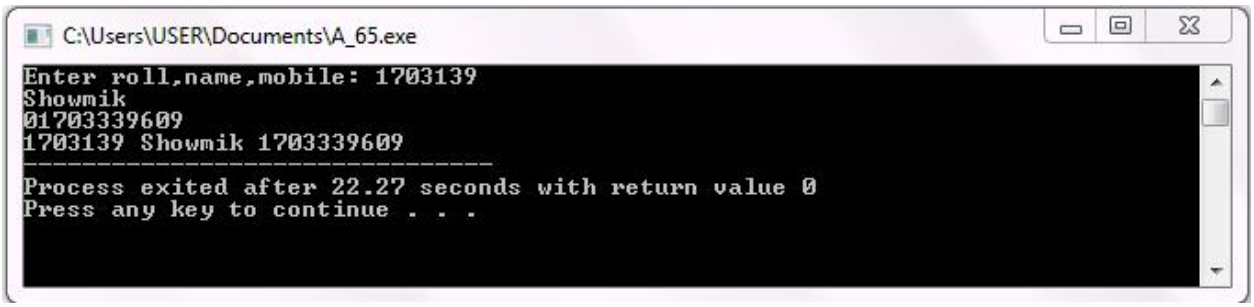
65) Write a C code to take your roll, name and mobile number as input and then write them down in a .txt file in the following manner:

sample .txt file

1234 Frank Abaglane 01630445566

```
#include<stdio.h>

#include<conio.h>

int main()
```

```
{
	int roll,mobile;
	char name[30];
	FILE *fptr;
	fptr=fopen("C:\\showmik_program.txt","w");



	printf("Enter roll,name,mobile: ");
	scanf("%d %s %d",&roll,name,&mobile);
	fclose(fptr);
		fptr=fopen("C:\\showmik_program.txt","r");
	printf("%d %s %d",roll,name,mobile);
	fclose(fptr);


	return 0;
}
```



66) Write a C code to retrieve the written information in problem 65 from the .txt file into a structure named **student** such as:

```
student{
int roll;
char name[40];
char mobile_no[12];
}
```

(P.S: You have to retrieve the whole name regardless of the space between)

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

```
#include <stdlib.h>
#include <string.h>

enum { MAX_MESSAGES = 20 };

typedef struct Message
{
   char dest[16];
   char text[512];
} Message;

static int read_message(FILE *fp, Message *msg)
{
   char line[sizeof(msg->text) + 1];
   msg->dest[0] = '\0';
   msg->text[0] = '\0';
   while (fgets(line, sizeof(line), fp) != 0)
   {
      //printf("Data: %zu <<%s>>\n", strlen(line), line);
      if (line[0] == '\n')
         continue;
      size_t len = strlen(line);
      line[--len] = '\0';
      if (msg->dest[0] == '\0')
      {
         if (len < sizeof(msg->dest))
         {
            memmove(msg->dest, line, len + 1);
```

```
            //printf("Name: <<%s>>\n", msg->dest);
          }
          else
          {
            fprintf(stderr, "%s\n",
                  line, len, sizeof(msg->dest)-1);
            exit(EXIT_FAILURE);
          }
        }
        else
        {
          if (len < sizeof(msg->text))
          {
            memmove(msg->text, line, len + 1);
            //printf("Text: <<%s>>\n", msg->dest);
            return 0;
          }
          else
          {
            fprintf(stderr, " %s\n",
                  msg->dest, len, sizeof(msg->dest)-1);
            exit(EXIT_FAILURE);
          }
        }
      }
      return EOF;
}
```

```
int main(void)
{
   Message mbox[MAX_MESSAGES];
   int n_msgs;

   for (n_msgs = 0; n_msgs < MAX_MESSAGES; n_msgs++)
   {
      if (read_message(stdin, &mbox[n_msgs]) == EOF)
         break;
   }

   printf("Inbox (%d messages):\n\n", n_msgs);
   for (int i = 0; i < n_msgs; i++)
      printf("%d: %s\n   %s\n\n", i + 1, mbox[i].dest, mbox[i].text);

   return 0;
}
```