1.To read the radius of the circle and to find area and circumference.

```
#include<stdio.h>
void main()
{
int radius;
float PI=3.14,area,circumference;
clrscr();
printf("\n Enter the radius of circle");
scanf("%d",&radius);
area=PI*radius*radius;
circumference=2*PI*radius;
printf("\n Area of a circle is:%f",area);
printf("\n Circumference of a circle is:%f",Circumference);
getch();
}
```

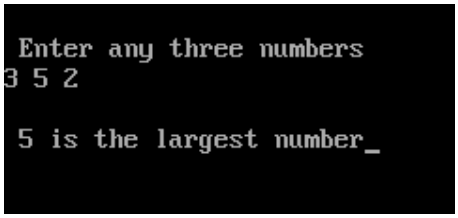
Output:

```
 Enter the radius of circle
5

 Area of a circle is:78.500000
 Circumference of a circle is:31.400002_
```

2. To read the numbers and find the biggest of three.

```
#include<stdio.h>
void main()
{
int num1,num2,num3;
clrscr();
printf("\n Enter any three numbers");
scanf("%d %d %d",&num1,&num2,&num3);
if(num1>=num2 && num1>=num3)
printf("\n %d is the largest number",num1);
else if(num2>=num3)
printf("\n %d is the largest number",num2);
else
printf("\n %d is the largest number",num3);
getch();
}
```

Output:

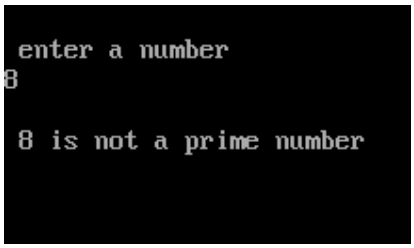


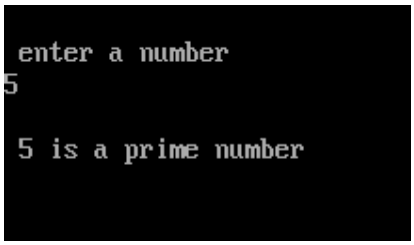
3. To check whether the number is prime or not.

```
#include<stdio.h>
void main()
{
 int num,count=0,i;
 clrscr();
```

```
 printf("\n enter a number \n");
 scanf("%d",&num);
for(i=1;i<=num;i++)
{
  if(num%i==0)
  count++;
}
if(count==2)
printf("\n %d is a prime number\n",num);
else
printf("\n %d is not a prime number\n",num);
getch();
}
```

Output:





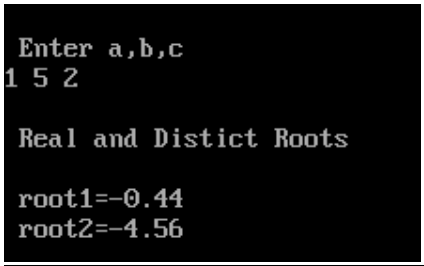
4. To find the root of quadratic equation.

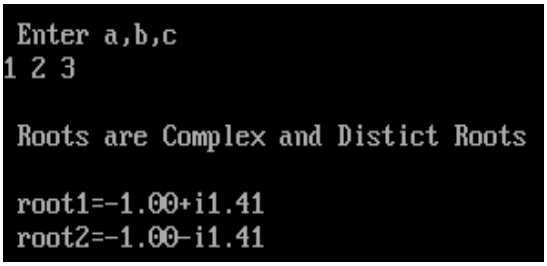
```
#include<stdio.h>
#include<math.h>
void main()
{
 int a,b,c,choice;
 double disc,r1,r2,real,img;
 clrscr();
```

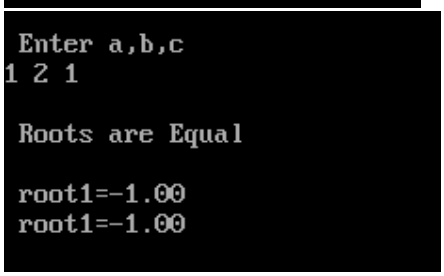
```
printf("\n Enter a,b,c \n");
scanf("%d%d%d",&a,&b,&c);
disc=(b*b)-(4*a*c);
if(disc>0)
choice=1;
else if(disc<0)
choice=2;
else
choice=3;
switch(choice)
{
 case 1:
        {
           printf("\n Real and Distict Roots \n");
           r1=(-b+sqrt(disc))/(2.0*a);
           r2=(-b-sqrt(disc))/(2.0*a);
           printf("\n root1=%0.2lf",r1);
           printf("\n root2=%0.2lf",r2);
         }
         break;

case 2:
          {
           printf("\n Roots are Complex and Distict Roots \n");
           real=-b/(2.0*a);
           img=sqrt(abs(disc))/(2.0*a);
           printf("\n root1=%0.2lf+i%0.2lf",real,img);
```

```
            printf("\n root2=%0.2lf-i%0.2lf",real,img);
          }
          break;
case 3:
         {
            printf("\n Roots are Equal \n");
           r1=-b/(2.0*a);
           r2=-b/(2.0*a);
            printf("\n root1=%0.2lf",r1);
            printf("\n root1=%0.2lf",r2);
          }
          break;
  default:printf("\n invalid inputs");
 }
getch();
}
```

Output:



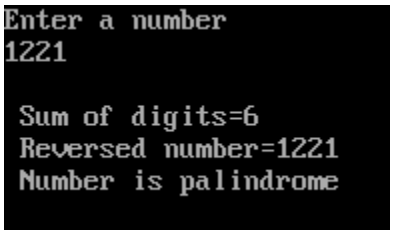


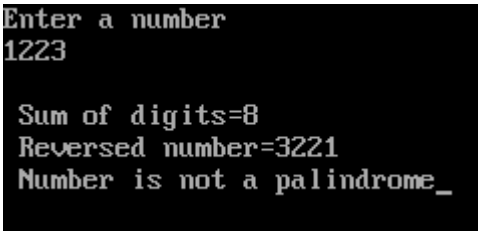


5. To read a number, find the sum of the digits, reverse the number and check it for palindrome.

```
#include<stdio.h>
#include<conio.h>
void main()
{
int num,orgnum;
int sum=0,rev=0,rem;
clrscr();
printf("Enter a number");
scanf("%d",&num);
orgnum=num;
while(num>0)
{
rem=num%10;
sum=sum+rem;
rev=rev*10+rem;
num=num/10;
}
printf("\n Sum of digits=%d",sum);
printf("\n Reversed number=%d",rev);
if(orgnum==rev)
printf("\n Number is palindrome");
else
printf("\n Number is not a palindrome");
getch();
}
```

Output:

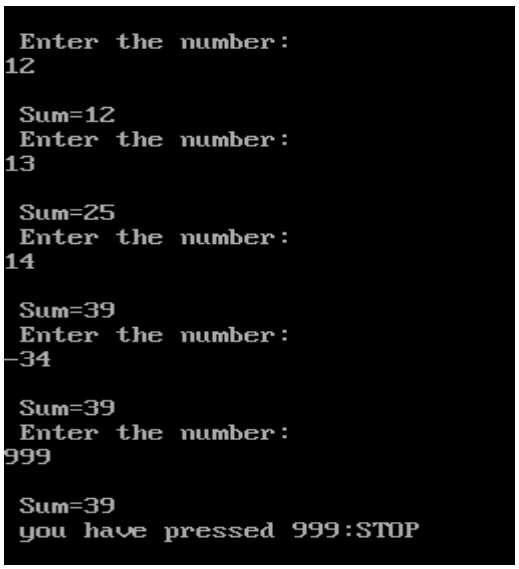




6.To read the numbers from keyboard continuously till the user presses 999 and to find the sum of only positive numbers.

```
#include<stdio.h>
#include<conio.h>
void main()
{
  int num,sum=0;
  clrscr();
  do{
        printf("\n Enter the number:\n");
        scanf("%d",&num);
        if(num>0 && num!=999)
        sum=sum+num;
        printf("\n Sum=%d",sum);
    }while(num!=999);
  printf("\n you have pressed 999:STOP\n");
  getch();
}
```

Output:

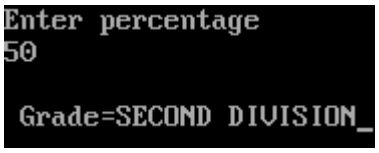


7. To read percentage of marks and to display appropriate message. If a percentage is 70 and above- Distinction, 60-69 – First Class, 50-59 – Second Class, 40-49 Pass, below 40 – Fail. (Demonstrate of if-else ladder)

```
#include<stdio.h>
#include<conio.h>
void main()
{
float per;
clrscr();
printf("Enter percentage");
scanf("%f",&per);
if(per>=90)
printf("\n Grade=EXEMPLARY");
else if(per>=80&&per<90)
printf("\n Grade=OUTSTANDING");
else if(per>=70&&per<80)
printf("\n Grade=FIRST DIVISION WITH DISTINCTION");
```

```
else if(per>=60&&per<70)
printf("\n Grade=FIRST DIVISION");
else if(per>=50&&per<60)
printf("\n Grade=SECOND DIVISION");
else if(per>=35&&per<50)
printf("\n Grade=PASS CLASS");
else
printf("\n Grade=FAILS:RE-APPEAR");
getch();
}
```

Output:

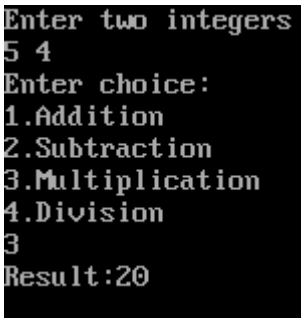


8. To simulate a simple calculator with addition, subtraction, multiplication, division and it should display the error message for division of zero using switch case.

```
#include<stdio.h>
int main()
{
int a,b,choice;
clrscr();
printf("Enter two integers");
scanf("%d%d",&a,&b);
printf("Enter
choice:\n1.Addition\n2.Subtraction\n3.Multiplication\n4.Division\n");
scanf("%d",&choice);
```

```
switch(choice)
{
case 1:printf("Result:%d",a+b);
break;
case 2:printf("Result:%d",a-b);
break;
case 3:printf("Result:%d",a*b);
break;
case 4:if(b!=0)
printf("Result=%2f",(float)a/b);
else
printf("Error! Division by zero not possible");
break;
default:printf("Error!, Invalid choice");
break;
}
getch();
}
```

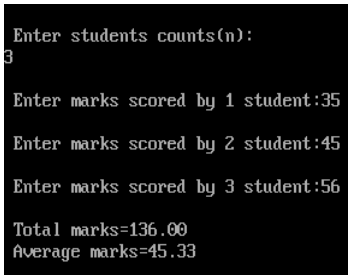
Output:



9. To read marks scored by n students and find the average of mark (Demonstration of single dimensional array)

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n,i;
float marks[10],tot_marks=0.0,avg_marks=0.0;
clrscr();
printf("\n Enter students counts(n):");
scanf("%d",&n);
for(i=0;i<n;i++)
{
printf("\n Enter marks scored by %d student:",i+1);
scanf("%f",&marks[i]);
tot_marks=tot_marks+marks[i];
}
avg_marks=tot_marks/n;
printf("\n Total marks=%0.2f",tot_marks);
printf("\n Average marks=%0.2f",avg_marks);
getch();
}
```

Output:

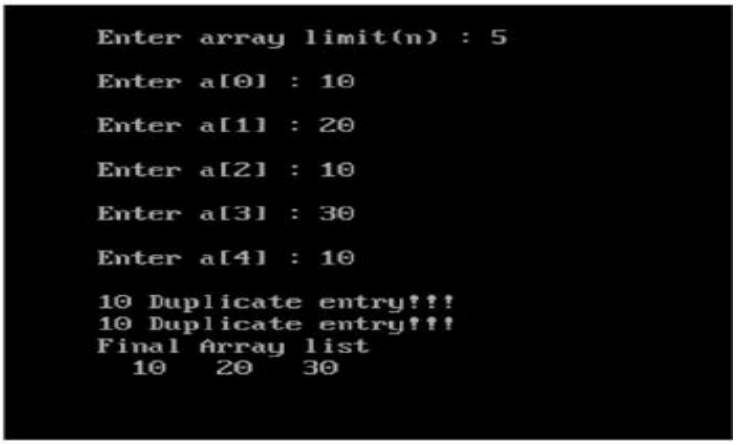


10.To remove duplicate elements in a single dimensional array

```
#include<stdio.h>
#include<conio.h>
Void main ()
{
int a[20],n,i,j,ele;
clrscr();
printf("\n Enter arraylimit(n):");
scanf("%d",&n);
for(i=0;i<n-1;i++)
{
    printf("\n Enter a[%d]:",i);
     scanf("%d",&a[i]);
}
//removal of duplicate
for(i=0;i<n-1;i++)
{
        ele=a[i];
        for(j=j+1;j<n;j++)
        {
              if(ele==a[j] &&a[j]!=-111)
                {
                 printf("\n %d duplicate entry!!!",a[j]);
                a[j]=-111;//set -111 for duplicate entry
                }
        }
}
printf("\n Final Array List \n");
```

```
for(i=0;i<n;i++)
{
        If(a[i]!=-111)
        printf(“%5d”,a[i]);
}
getch ();
}
```

Output:

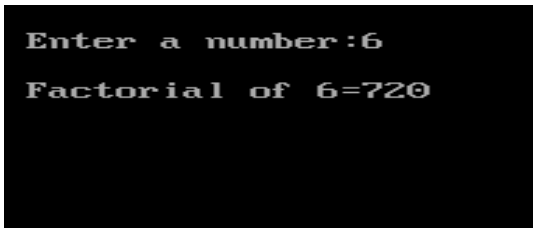


11.To find the factorial of a number

```
#include<stdio.h>
#include<conio.h>
void main()
{
  int num,i;
  long int fact=1;
  clrscr();
  printf("\n Enter a number:");
  scanf("%d",&num);
  for(i=1;i<=num;i++)
```

```
  {
     fact=fact*i;
  }
  printf("\n Factorial of %d=%ld",num,fact);
  getch();
}
```

Output:



12. To generate Fibonacci Series

```
#include<stdio.h>
#include<conio.h>
void main()
{
  int NXT,F=0,S=1;
  int i,n;
  clrscr();
  printf("\n Enter series limit:");
  scanf("%d",&n);
  printf("\n ******FIBONACCI SERIES*****\n");
  printf("%d\t%d",F,S);
  for(i=3;i<=n;i++)
  {
    NXT=F+S;
    printf("\t %d",NXT);
```

```
    F=S;
    S=NXT;
  }
  getch();
}
```

Output:

13.To demonstrate string functions (String Length, String Copy, String Concatenate, String Comparison)

```
#include<stdio.h>
#include<conio.h>
#include<string.h>
void main()
{
  char *str1="Bengaluru";
  char *str2="Nagara";
  clrscr();
  printf("\n String1=%s Strin2=%s\n",str1,str2);
  printf("\n 1.Length of %s=%d",str1,strlen(str1));
  printf("\n 2.String copy in str2=%s",strcpy(str2,"city"));
  printf("\n 3.Concatenation =%s",strcat(str1,str2));
  printf("\n 4.Compare str1 & str2 %d",strcmp(str1,str2));
```

```
  printf("\n 5.String in lowercase=%s",strlwr(str1));
  printf("\n 6.String in Uppercase=%s",strupr(str1));
  printf("\n 7.substring search=%s",strchr(str1,'N'));
  printf("\n 8.Duplicate string=%s",strdup(str1));
  printf("\n 9.String reverse=%s",strrev(str1));
  printf("\n 10.set all characters to #=%s",strset(str1,'#'));
  getch();
}
```

Output:

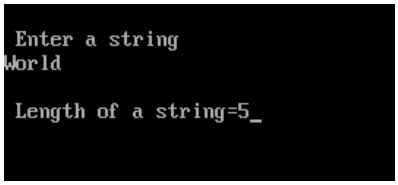
```
String1=Bengaluru Strin2=Nagara

1.Lenghth of Bengaluru=9
2.String copy in str2=city
3.Concatenation =Bengalurucity
4.Compare str1 & str2 -39
5.String in lowercase=bengalurucity
6.String in Uppercase=BENGALURUCITY
7.substring search=NGALURUCITY
8.Duplicate string=BENGALURUCITY
9.String reverse=YTICURULAGNEB
10.set all characters to #=##############
```

14. To find the length of a string without using built-in function.

```
#include<stdio.h>
#include<conio.h>
void main()
{
   int len=0,i=0;
   char *str;
   clrscr();
   printf("\n Enter a string");
   scanf("%s",str);
```

```
    while(str[i]!='\0')
    {
    len++;
    i++;
    }
    printf("\n Length of a string=%d",len);
    getch();
}
```

Output:



15. To read, display and add two n x m matrices using function.

```
#include <stdio.h>

  int rows, columns;

  /* adds two matrices and stores the output in third matrix */
  void matrixAddition(int mat1[][10], int mat2[][10], int mat3[][10]) {
      int i, j;

      for (i = 0; i < rows; i++) {
          for (j = 0; j < columns; j++) {
              mat3[i][j] = mat1[i][j] + mat2[i][j];
          }
      }
```

```
    return;
}

int main() {
    int matrix1[10][10], matrix2[10][10];
    int matrix3[10][10], i, j;
                                clrscr();
    /* get the number of rows and columns from user */
    printf("Enter the no of rows and columns(<=10):");
    scanf("%d%d", &rows, &columns);

    if (rows > 10 || columns > 10) {
        printf("No of rows/columns is greater than 10\n");
        return 0;
    }

    /* input first matrix */
    printf("Enter the input for first matrix:");
                                for (i = 0; i < rows; i++) {
        for (j = 0; j < columns; j++) {
            scanf("%d", &matrix1[i][j]);
        }
    }

    /* input second matrix */
    printf("Enter the input for second matrix:");
    for (i = 0; i < rows; i++) {
```

```
            for (j = 0; j < columns; j++) {
                  scanf("%d", &matrix2[i][j]);
            }
                                    }

      /* matrix addtion */
      matrixAddition(matrix1, matrix2, matrix3);

      /* print the results */
      printf("\nResult of Matrix Addition:\n");
      for (i = 0; i < rows; i++) {
            for (j = 0; j < columns; j++) {
                  printf("%5d", matrix3[i][j]);
            }
            printf("\n");
                                    }
                                    getch();
 }
```

Output:

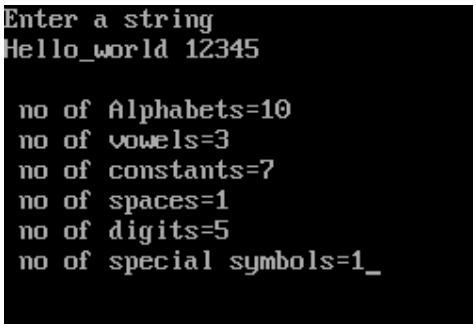
```
Enter the no of rows and columns(<=10):
2 2
Enter the input for first matrix:
1 3
4 5
Enter the input for second matrix:
2 5
4 5

Result of Matrix Addition:
    3    8
    8   10
```

16.To read a string and to find the number of alphabets,digits,vowels,consonants,space and special characters.

```
#include<stdio.h>
#include<conio.h>
#include<ctype.h>
void main()
{
char str[100],ch;
int acount=0,dcount=0,vcount=0,ccount=0,scount=0,spcount=0,i=0;
clrscr();
printf("Enter a string");
gets(str);
while(str[i]!='\0')
{
if(isalpha(str[i])
{
acount++;
ch=tolower(str[i]);
switch(ch)
{
case 'a':
case 'e':
case 'i':
case 'o';
case 'u': vcount++;
          break;
default:ccount++;
}
```

```
}
else if(isdigit(str[i]))
dcount++;
else if(isspace(str[i]))
scount++;
else
spcount++;
i=i+1;
}
printf("\n no of Alphabets=%d",acount);
printf("\n no of vowels=%d",vcount);
printf("\n no of constants=%d",ccount);
printf("\n no of spaces=%d",scount);
printf("\n no of digits=%d",dcount);
printf("\n no of special symbols=%d",spcount);
getch();
}
```

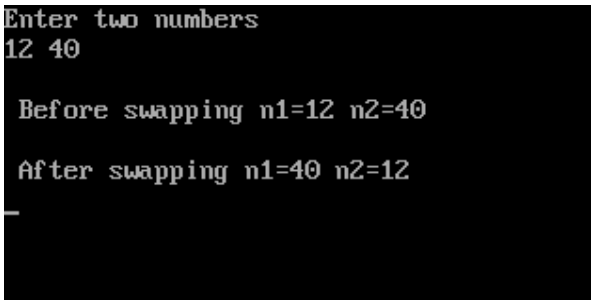
Output:



17.To swap two numbers using pointers

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n1,n2,*ptr1,*ptr2,temp;
clrscr();
printf("Enter two numbers");
scanf("%d%d",&n1,&n2);
printf("\n Before swapping n1=%d n2=%d\n",n1,n2);
ptr1=&n1;
ptr2=&n2;
temp=*ptr1;
*ptr1=*ptr2;
*ptr2=temp;
printf("\n After swapping n1=%d n2=%d\n",n1,n2);
getch();
}
```

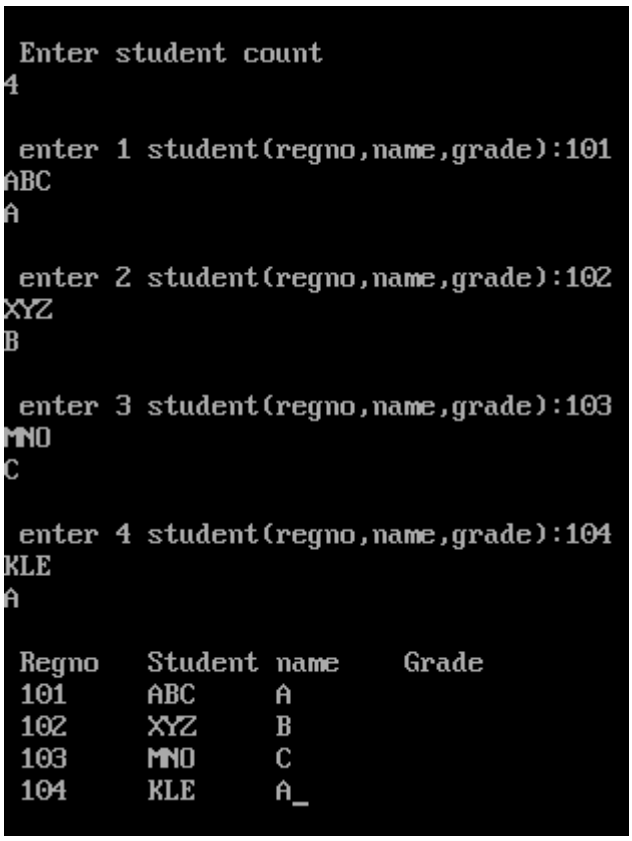
Output:



18.To demonstrate student structure to read & display records of n students

```
#include<stdio.h>
struct student{
char name[50];
int regno;
char grade;
} S[50];
void main()
{
  int n,i;
  clrscr();
  printf("\n Enter student count \n");
  scanf("%d",&n);
  for(i=0;i<n;i++)
  {
       printf("\n enter %d student(regno,name,grade):",i+1);
      scanf("%d  %s %c",&S[i].regno,&S[i].name,&S[i].grade);
  }
 printf("\n Regno \t Student name \t Grade);
 for(i=0;i<n;i++)
{
 printf("\n %d \t %s \t %c",S[i].regno,S[i].name,S[i].grade);
}
getch();
}
```

Output:



19. To demonstrate the difference between structure and union for the following Student name (String), Student roll no(integer), Student mark(float)

```
#include<stdio.h>
#include<conio.h>
struct Stud1
{
int regno;
char name[50];
float marks;
};
union Stud2
{
```

```
int regno;
char name[50];
float marks;
};
void main()
{
clrscr();
printf("\n size of stucture of Stud1=%d",sizeof(struct Stud1));
printf("\n size of stucture of Stud2=%d",sizeof(union Stud2));
getch();
}
```

Output:

```
size of stucture of Stud1=56
size of stucture of Stud2=50_
```

20. To design the following pattern using nested for loop:

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

```
#include <stdio.h>
#include<conio.h>
int main()
{
   int rows = 5,n,i,j,k;
```

```
    clrscr();
    // first loop to print all rows
    for ( i = 0; i < rows; i++) {

// inner loop 1 to print white spaces
for (j = 0; j < 2 * (rows - i) - 1; j++) {
    printf(" ");
}

// inner loop 2 to print star * character
for ( k = 0; k < 2 * i + 1; k++)
{
     printf("* ");
 }
printf("\n");
}
getch();
}
```

Output: