

142 – GOVERNMENT POLYTECHNIC COLLEGE, KELAMANGALAM.

DEPARTMENT OF COMPUTER ENGINEERING

REGULATION 2023, III SEMESTER, PRACTICUM

1052233440 - C PROGRAMMING

List of Experiments

PART - A

Ex No 1: Write a C program to calculate the simple interest and compound interest.

Ex No 2: Write a C program to find the area of a circle and a rectangle
(use pre-processing directory for defining pi value).

Ex No 3: Write a C program to find the largest of three numbers.

Ex No 4: Write a C program to generate all prime numbers from 1 to N.

Ex No 5: Write a C program to find factorial of a given number using recursion.

PART - B

Ex No 6: Write a C program to demonstrate matrix addition and transpose operations.

Ex No 7: Write a C program to find the length and reverse a string using pointers.

Ex No 8: Write a C program for implementing linear search using pointer to an array.

Ex No 09: Write a C program to collect and print student details like name, marks,
etc. and then calculate total and average mark using structure.

Ex No 10: Write a C program to count the number of characters, words and lines
in a file.

Strength • Truth • Endurance

EX NO : 1

SIMPLE AND COMPOUND INTEREST

AIM:

To write a C program to calculate simple and compound interest.

PROCEDURE:

1. Start the program.
2. Read principle amount (P), Rate of interest(R), Number of years (N).
3. Calculate simple interest and compound interest using the formula,

$$\text{Simple Interest} = (P*N*R)/100$$

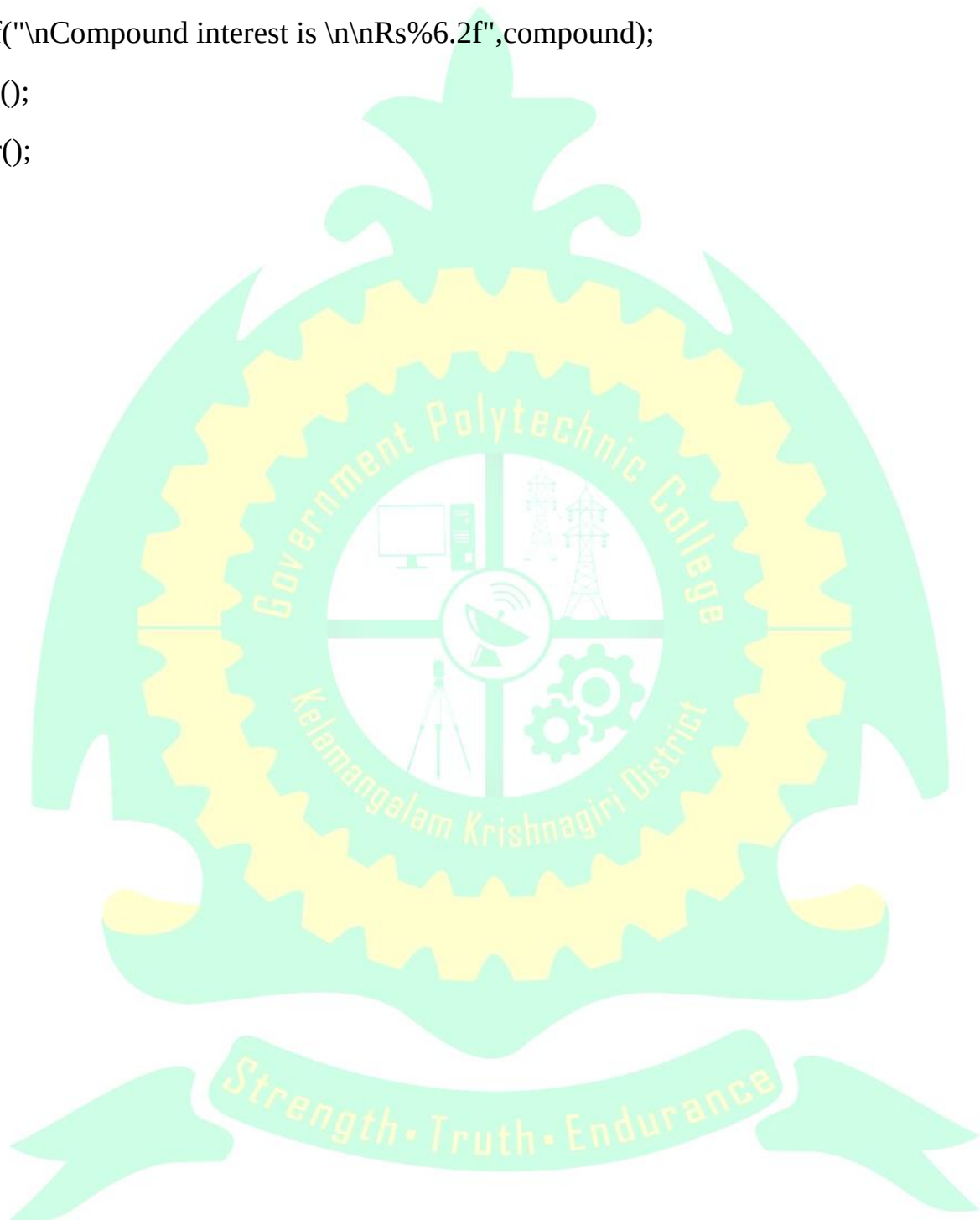
$$\text{Compound Interest} = P*((1 + R)/100)^n - P$$

4. Print the values Simple and Compound.
5. Stop the program.

PROGRAM:

```
#include<stdio.h>
#include<conio.h>
#include<math.h>
void main()
{
float P,N,R,simple,compound;
printf("Enter principal amount \n");
scanf("%f",&P);
printf("Enter the rate of interest \n");
scanf("%f",&R);
printf("Enter the number of years \n");
scanf("%f",&N);
simple=P*N*R/100;
```

```
compound=P*pow(1+R/100,N)-P;  
printf("\nSimple interest is \n\nRs%6.2f",simple);  
printf("\n");  
printf("\nCompound interest is \n\nRs%6.2f",compound);  
getch();  
clrscr();  
}
```

**RESULT:**

Thus the values of simple and compound interest were calculated and verified successfully.

EX.NO : 2**AREA OF A CIRCLE AND A RECTANGLE****AIM:**

To write a C program to find the area of a circle and a rectangle.

PROCEDURE:

1. Start the program.
2. Define the PI value using preprocessing directive.
3. Read the values of r = Radius, l = Length, b = Breadth, a = Area.
4. Calculate the area of a circle using the formula,

$$a=PI*r*r$$

5. Calculate the area of a rectangle using the formula,

$$a=l*b$$

6. Print the result.
7. Stop the program.

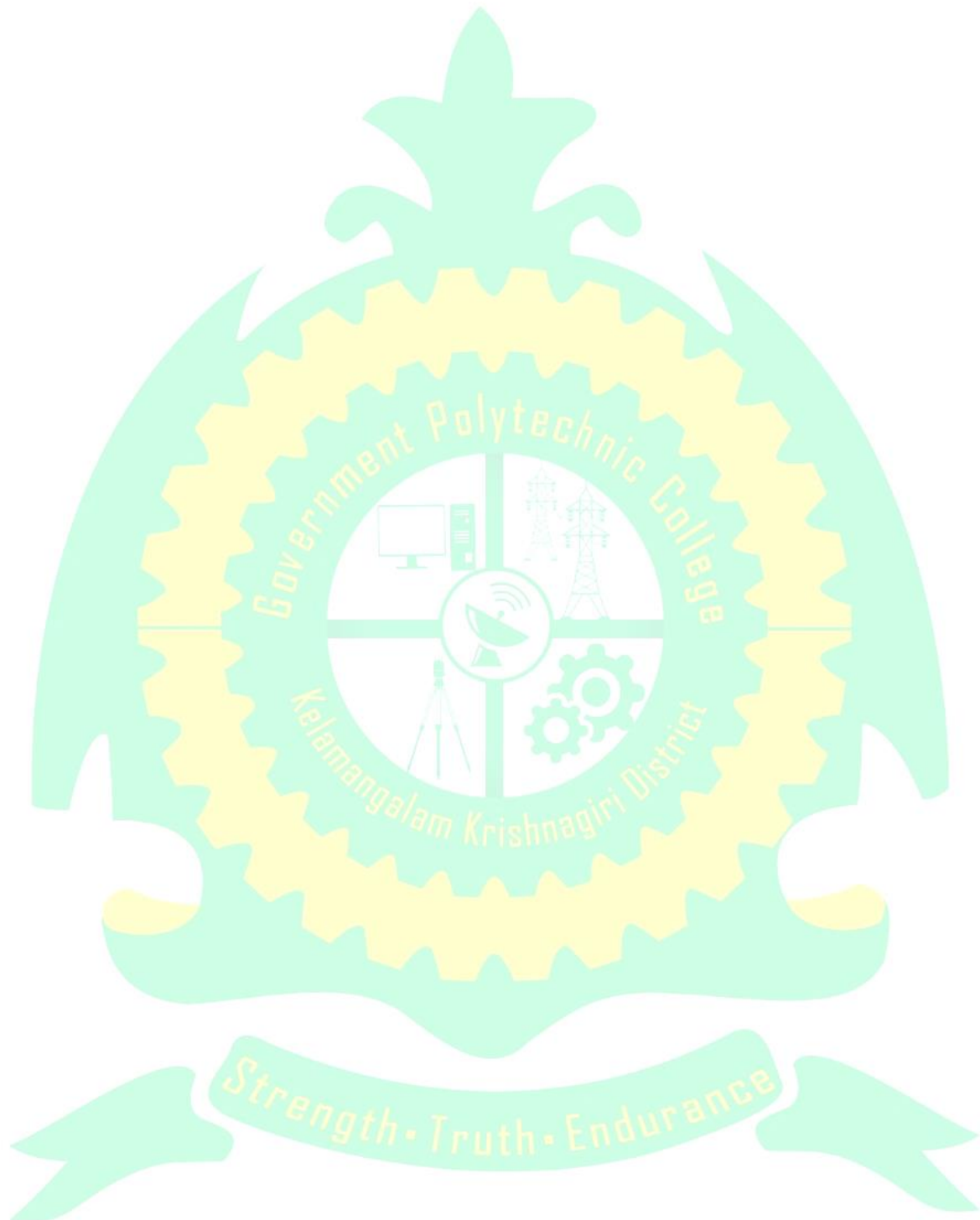
PROGRAM:

```
#include<stdio.h>

#define PI 3.14

void main()
{
    float r,l,b,a;
    printf("Enter the radius of the circle: ");
    scanf("%f",&r);
    a=PI*r*r;
    printf("The area of the circle is: %f\n",a);
    printf("\nEnter the length of the rectangle: ");
    scanf("%f",&l);
    printf("Enter the breadth of the rectangle: ");
    scanf("%f",&b);
    a=l*b;
```

```
printf("The area of the rectangle is:%f\n",a);  
getch();  
clrscr();  
}
```



RESULT:

Thus the area of a circle and a rectangle were calculated and verified successfully.

EX.NO : 3

LARGEST OF THREE NUMBERS

AIM:

To write a C program to find the largest of given three numbers.

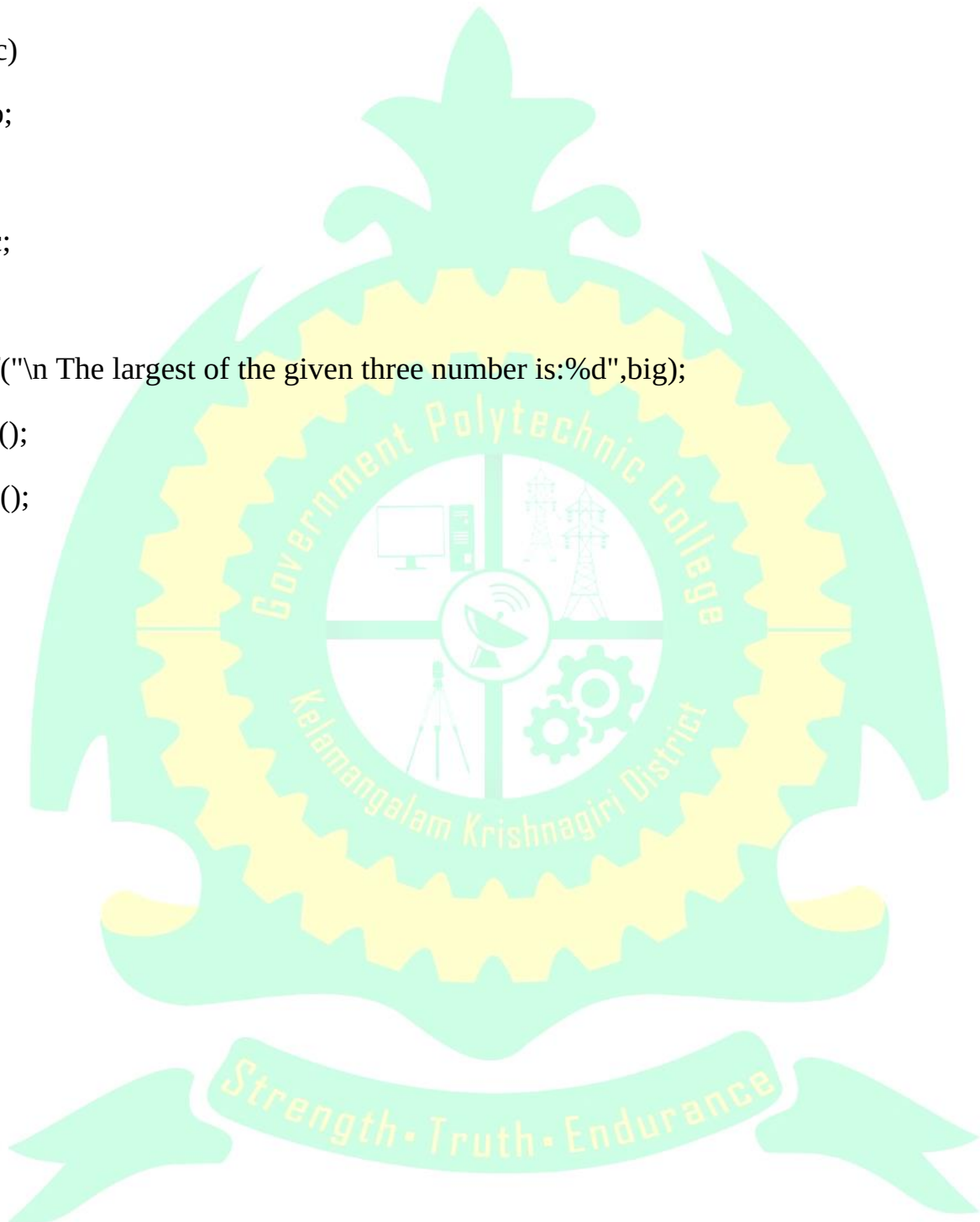
PROCEDURE:

1. Start the program.
2. Read the values of a, b and c.
3. If $(a > b)$ and $(a > c)$, then print a is greater.
4. If $(b > a)$ and $(b > c)$, then print b is greater.
5. Otherwise print c is greater.
6. Stop the program.

PROGRAM:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a,b,c,big;
printf("Enter three integer number one by one\n");
scanf("%d%d%d",&a,&b,&c);
if(a>b)
{
if(a>c)
big=a;
else
big=c;
```

```
}  
else  
{  
if(b>c)  
big=b;  
else  
big=c;  
}  
printf("\n The largest of the given three number is:%d",big);  
getch();  
clrscr();  
}
```



RESULT:

Thus the C program for finding the largest number between given three numbers was executed and verified successfully.

EX.NO : 4

PRIME NUMBER UPTO 'N' NUMBERS

AIM:

To write a C program to generate all prime numbers from 1 to N.

PROCEDURE:

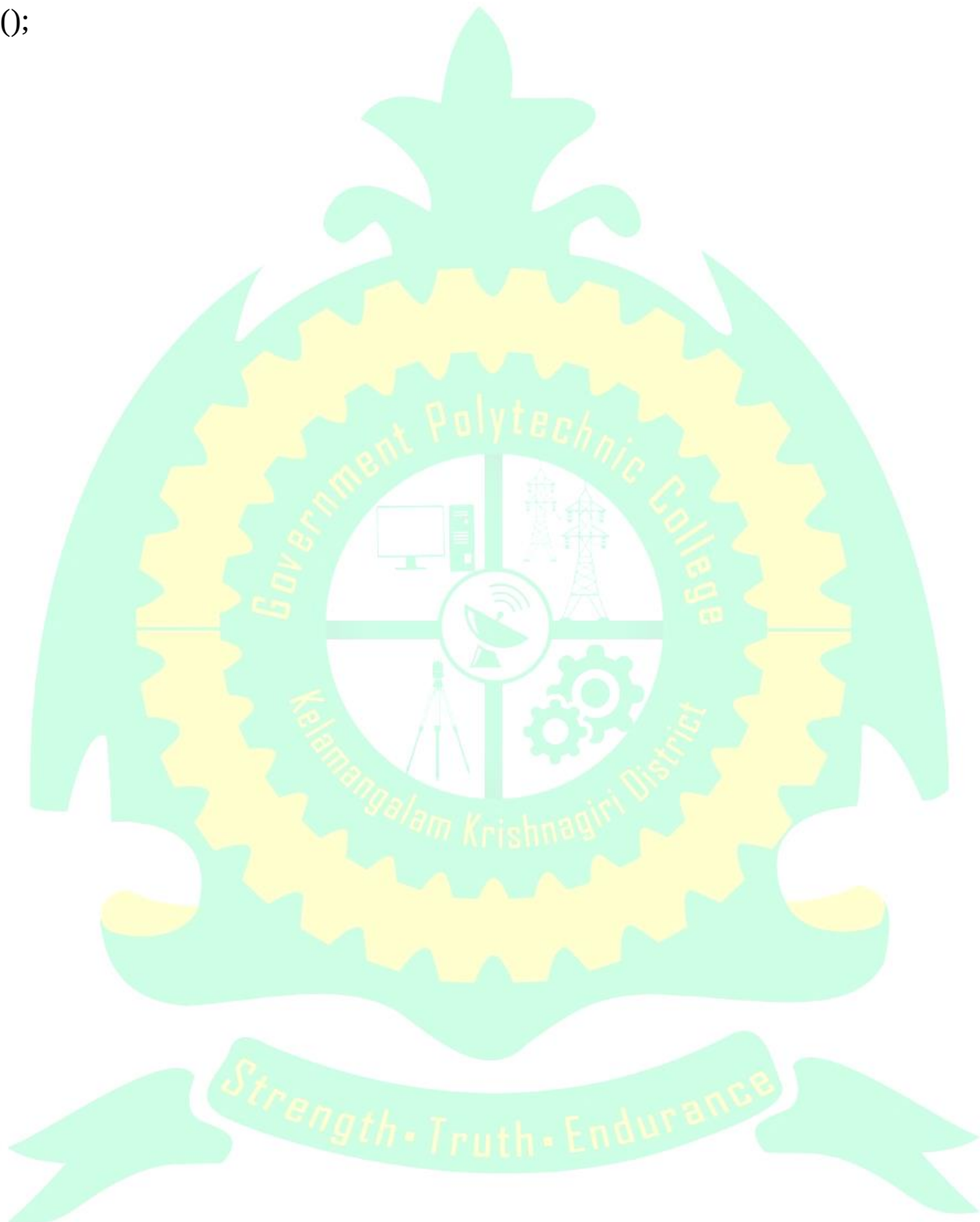
1. Start the program.
2. Read the value of n.
3. Using for loop do $r=i\%j$, if $(r==0)$ exit from loop.
4. Then check $(j==i)$ if it is true print the value of i.
5. Print the result.
6. Stop the program

PROGRAM:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int n,i,j,r;
    printf("Give the value of n \n");
    scanf("%d",&n);
    for(i=1;i<=n;i++)
    {
        for(j=1;j<i;j++)
        {
            r=i%j;
            if(r==0)
                break;
        }
        if(j==i)
```



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

**RESULT:**

Thus the C program for generating the prime numbers from 1 to N was executed and verified successfully.

EX.NO : 5

FACTORIAL OF A NUMBER

AIM:

To write a C program to find the factorial of the given number using recursion.

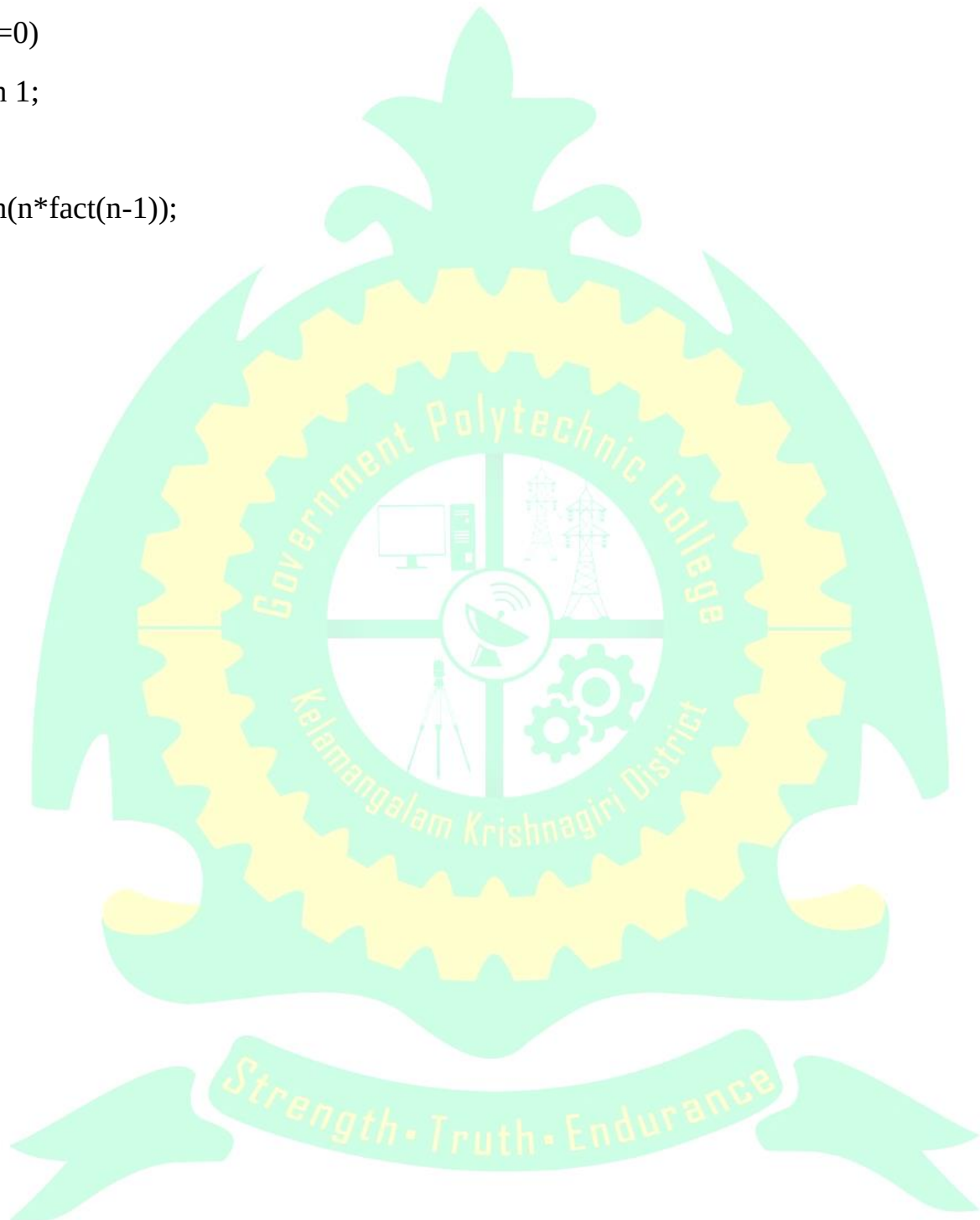
PROCEDURE:

1. Start the program.
2. Read variable n,f.
3. Read the variable n, call and print the function fact(n).
4. Stop and Start the function fact.
5. Check if $n=0$ then return 1 else call and print the function fact(n).
6. Return factorial using the recursion formula,
 $\text{return}(n*\text{fact}(n-1)).$
7. Print the result.
8. Stop the program.

PROGRAM:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int n,f;
    clrscr();
    printf("Enter the number : \n");
    scanf("%d",&n);
    f=fact(n);
    printf("Factorial of the given number %d is %d",n,f);
    getch();
}
```

```
}  
int fact(int n)  
{  
if(n==0)  
return 1;  
else  
return(n*fact(n-1));  
}
```



RESULT:

Thus the C program for finding the factorial of a given number using recursion was executed and verified successfully.

EX.NO : 6

MATRIX ADDITION AND TRANSPOSE OPERATIONS

AIM:

To write a C program to demonstrate matrix addition and transpose operations.

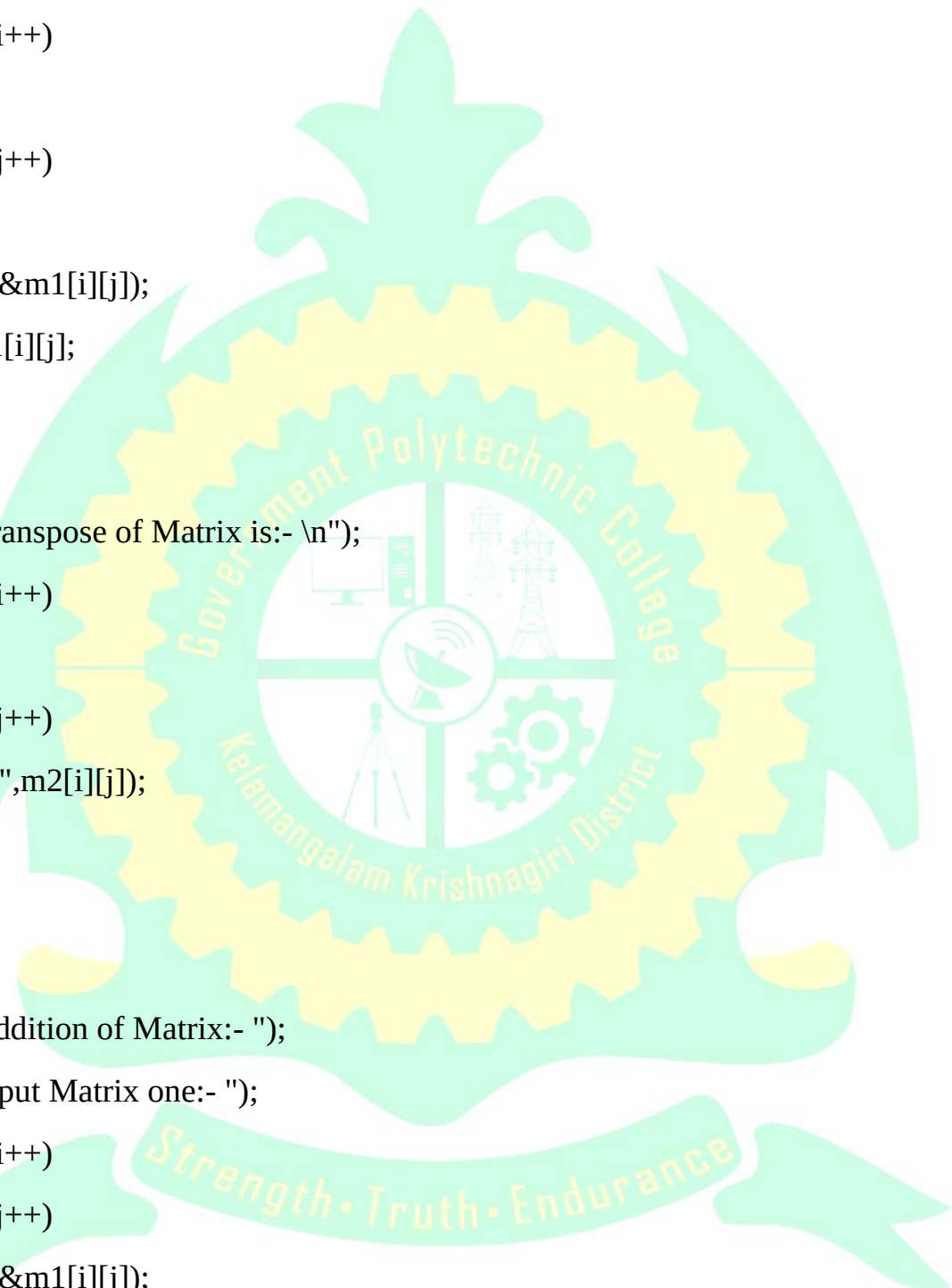
PROCEDURE:

1. Start the program.
2. Declare the matrix `m1[3][3],m2[3][3],m3[3][3]`
3. Read the transpose of matrix elements.
4. Using nested for loop to iterate the elements.
5. To transpose of the matrix using
$$m2[j][i]=m1[i][j]$$
6. Print the transpose of matrix.
7. Read the input matrix one and matrix two to do matrix addition.
8. Using nested for loop to read the elements.
9. To add the matrix using
$$m3[i][j]=m1[i][j]+m2[i][j]$$
10. Print the sum.
11. Stop the program.

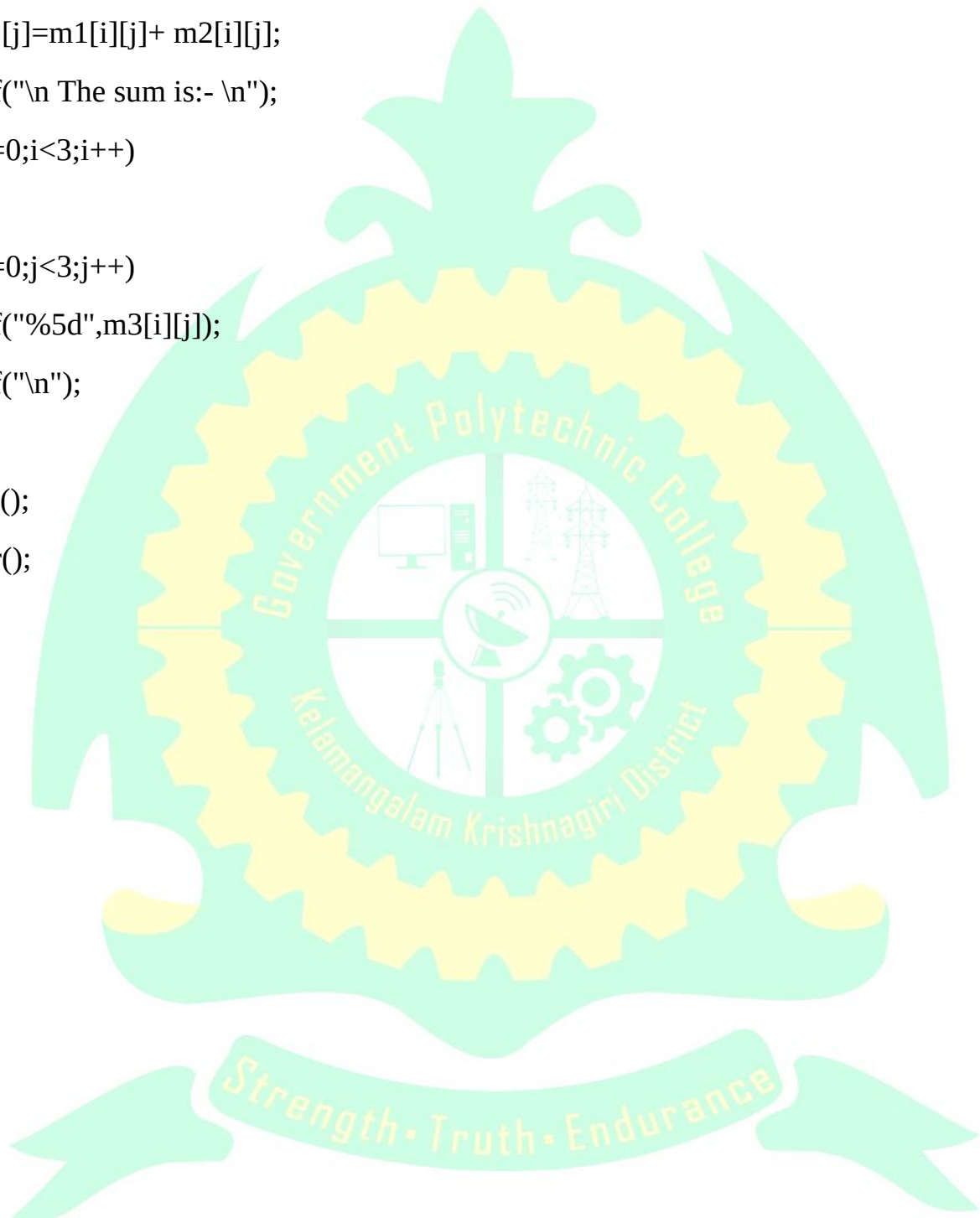
PROGRAM:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int m1[3][3],m2[3][3],m3[3][3],i,j;
```

```
{  
printf("\n Transpose of Matrix:- ");  
printf("\n Enter the element :- ");  
for(i=0;i<3;i++)  
{  
for(j=0;j<3;j++)  
{  
scanf("%d",&m1[i][j]);  
m2[j][i]=m1[i][j];  
}  
}  
printf("\n Transpose of Matrix is:- \n");  
for(i=0;i<3;i++)  
{  
for(j=0;j<3;j++)  
printf("\t%d",m2[i][j]);  
printf("\n");  
}  
}  
printf("\n Addition of Matrix:- ");  
printf("\n Input Matrix one:- ");  
for(i=0;i<3;i++)  
for(j=0;j<3;j++)  
scanf("%d",&m1[i][j]);  
printf("\n Input Matrix two:- ");  
for(i=0;i<3;i++)  
for(j=0;j<3;j++)
```




```
scanf("%d",&m2[i][j]);  
for(i=0;i<3;i++)  
for(j=0;j<3;j++)  
m3[i][j]=m1[i][j]+ m2[i][j];  
printf("\n The sum is:- \n");  
for(i=0;i<3;i++)  
{  
for(j=0;j<3;j++)  
printf("%5d",m3[i][j]);  
printf("\n");  
}  
getch();  
clrscr();  
}
```



RESULT:

Thus the C program for demonstrate matrix addition and transpose operations was executed and verified successfully.

EX.NO : 7 LENGTH AND REVERSE OF A STRING USING POINTERS

AIM:

To write a C program to find the length and reverse a string using pointers.

PROCEDURE:

1. Start the program.
2. Read a string says pointer variable p.
3. Check `*p!='\0'` ,if it is true increment the variable i.
4. Print the length.
5. Read a string says pointer variable q.
6. Swap the variable using temp.
6. Print the reverse string.
7. Stop the program.

PROGRAM:

```
#include<stdio.h>
#include<conio.h>
void main()
{
char s[20];
char *p,*q,temp;
int length=0,i;
printf("Enter a string: ");
scanf("%s",s);
p=s;
while(*p!='\0')
```

```
{
length++;

p++;
}

printf("\n Length of a given string is: %d",length);

q=s;

p--;

for(i=0;i<(length-1)/2;i++)
{
temp=*p;
*p=*q;
*q=temp;

p--;
q++;
}

printf("\n The reserved string is: %s",s);

getch();

clrscr();
}
```

RESULT:

Thus the program for find the length and reverse of the given string was executed and verified successfully.

EX.NO : 8

LINEAR SEARCH USING POINTER TO AN ARRAY

AIM:

To write a C program for implementing linear search using pointer to an array.

PROCEDURE:

1. Start the program.
2. Read a string says pointer variable p.
3. Check `*p!='\0'` ,if it is true increment the variable i.
4. Print the length.
5. Read a string says pointer variable q.
6. Swap the variable using temp.
6. Print the reverse string.
7. Stop the program.

PROGRAM:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a[20],n,i,key,*p;
    printf("Enter the number of elements in the array \n");
    scanf("%d",&n);
    printf("Enter the elements of the array \n");
    for(i=0;i<n;i++)
        scanf("%d",&a[i]);
    printf("Enter the elements to search \n");
```

```
scanf("%d",&key);  
for(p=a;p<a+n;p++)  
{  
if(*p==key)  
{  
printf("\nThe given number %d is found in the array",key);  
printf("\nThe position of %d is %d",key,p-a+1);  
break;  
}  
}  
if(p-a==n)  
printf("\nThe element %d is not found in the array",key);  
getch();  
clrscr();  
}
```

RESULT:

Thus the program for implementing linear search using pointer to an array was executed and verified successfully.

EX.NO : 9

CALCULATE TOTAL MARKS FOR STUDENTS

AIM:

To Write a C program to collect and print student details like name, marks,etc. and then calculate total and average mark using structure.

PROCEDURE:

1. Start the program.
2. Read register no., Name and six subject marks.
3. Calculate total marks and average.
4. Display reg.no, name, marks, total and average.
5. Stop the program.

PROGRAM:

```
#include<stdio.h>
#include<conio.h>
struct student
{
int regno;
char name[20];
int mark[6];
int total;
float avg;
};
void main()
{
struct student s[100];
int n,i,j;
printf("\n Enter the number of students \n");
scanf("%d",&n);
for(i=0;i<n;i++)
```

```

{
printf("\n Enter the register number,name and six marks one by one\n");
scanf("%d%s",&s[i].regno,s[i].name);
for(j=0;j<6;j++)
{
scanf("%d",&s[i].mark[j]);
}
s[i].total=0;
for(j=0;j<6;j++)
{
s[i].total=s[i].total+s[i].mark[j];
}
s[i].avg=s[i].total/6.0;
printf("\n Total mark and average mark are \n");
printf("%d\t%s\t%d\t%8.2f\n",s[i].regno,s[i].name,s[i].total,s[i].avg);
}
getch();
clrscr();
}

```

RESULT:

Thus the total marks and average for N students using array of structures was executed and verified successfully.

EX.NO : 10

USING FILE

AIM:

To Write a C program to count the number of characters, words and lines in a file.

PROCEDURE:

1. Start the program.
2. Read characters, lines, words and pointer FILE.
3. Open the file.
4. If (f==NULL) print unable to open file.
5. while((ch=fgetc(f))!=EOF) then check number of characters, words and lines.
6. Close the file
5. Stop the program.

PROGRAM:

```
#include<stdio.h>
#include<stdlib.h>
void main()
{
FILE *f;
char ch;
int characters,lines,words;
clrscr();
f=fopen("sample.txt","r");
if(f==NULL)
{
puts("Unable to open file\n");
exit(0);
}
```

```
characters=lines=words=0;
while((ch=fgetc(f))!=EOF)
{
characters++;
if(ch=="\n"||ch=="\0")
lines++;
if(ch==' '||ch=='\t'||ch=="\n"||ch=="\0")
words++;
}
if(characters>0)
{
words++;
lines++;
}
printf("Number of words:%d\n",words);
printf("Number of characters:%d\n",characters);
printf("Number of lines:%d\n",lines);
fclose(f);
getch();
}
```

RESULT:

Thus the program to count the number of characters, words and lines in a file was executed and verified successfully.