PARALA MAHARAJA ENGINEERING COLLEGE, BERHAMPUR

Dept. of Computer Sc. & Engg.

"C PROGRAMMING" LABORATORY MANUAL

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C PROGRAMMING LAB

Experiment No. 1
Write a C program to find the sum of individual digits of a positive integer.

Experiment No. 2
A Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence. Write a C program to generate the first n terms of the sequence.

Experiment No. 3
Write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.

Experiment No. 4
Write a C program to calculate the following Sum:
Sum=1-x2/2! +x4/4!-x6/6!+x8/8!-x10/10! ……

Experiment No. 5
Write a C program to find the roots of a quadratic equation.

Experiment No. 6
Write C programs that use both recursive and non-recursive functions to find the factorial of a given integer.

Experiment No. 7
Write C programs that use both recursive and non-recursive functions to find the GCD (greatest common divisor) of two given integers.

Experiment No. 8
Write a C program to find both the larges and smallest number in a list of integers.

Experiment No. 9
Write a C program that uses functions to perform the following:
Addition of Two Matrices

Experiment No. 10
Write a C program that uses functions to perform the following:
Multiplication of Two Matrices

Experiment No. 11
Write a C program to determine if the given string is a palindrome or not.

Experiment No. 12
Write a C program to construct a pyramid of numbers.

Experiment No. 13
Write a C program to count the lines, spaces and characters in a given text.

Experiment No.14
Write a C program that uses the following operations:
i) Reading a complex number
ii) Writing a complex number
iii) Addition of two complex numbers
iv)Subtraction of two complex numbers
(represent complex number using a structure.)

Experiment No. 15
Write a program which copies one file to another.

Experiment No.1

PROGRAM

```
#include<stdio.h>
#include<conio.h>
void main( )
{
int a,b,s;
clrscr( );
s=0;
printf("Enter the number");
scanf("%d",&a);
while(a>0)
{
b=a%10;
s=s+b;
a=a/10;
}
printf("The sum of digits of the entered number=%d",s);
getch( );
}
```

Experiment No.2

PROGRAM

```
#include<stdio.h>
#include<conio.h>
void main( )
{
int a=0,b=1,c=0,i,n;
clrscr( );
printf("enter the range");
scanf("%d",&n);
for(i=1;i<=n;i++)
{
printf("%d",c);
a=b;
b=c;
c=a+b;
}
getch( );
}
```

Experiment No.3

PROGRAM

```
#include<stdio.h>
#include<conio.h>
void main( )
{
int n,i,k;
clrscr( );
printf("enter the upper limit");
scanf("%d",&n);
printf("the prime number in between 1 and %d are \n",n);
for(i=1;i<=n;i++)
{
k=2;
while(k<i)
{
if(i%k= =0)
{
break;
}
k++;
}
if(k= =i)
printf("%d",i);
}
getch( );
}
```

Experiment No.4

PROGRAM

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

void main( )
{
int x,n,i,j=0,f=1;
float s=0;
clrscr( );
printf("enter the value of x and n");
scanf("%d%d",&x,&n);
for(i=1;i<=n;i++)
{
if(i= =1)
{
s=s+f;
}
else
{
f=f*(j+1)*(j+2);
s=s+pow(-1,i+1)*pow(x,j+2)/(float)f;
j=j+2;
}
}
printf("the series output is %f",s);
getch( );
}
```

Experiment No.5

PROGRAM

```
#include<stdio.h>
#include<conio.h>
#include<math.h>
void main( )
{
int a,b,c;
float r1,r2,d;
clrscr( );
printf("enter the value of a,b,c");
scanf("%d%d%d",&a,&b,&c);
d=sqrt(b*b-4*a*c);
r1=(-b+d)/2*a;
r2=(-b-d)/2*a;
printf("root 1=%f",r1);
printf("root2=%f",r2);
getch( );
}
```

Experiment No.6

PROGRAM

Using Recursive Function

```
#include<stdio.h>
#include<conio.h>
int fact(int);
void main( )
{
int n,k;
clrscr( );
printf("enter the number");
scanf("%d",&n);
k=fact(n);
printf("the factorial of number=%d",k);
getch();
}
int fact(int x)
{
if(x= =0)
{
return(1);
}
else
{
return(x*fact(x-1));
}
}
```

Using Non-Recursive Function

```
#include<stdio.h>
#include<conio.h>
int fact(int);
void main( )
{
int n,k;
clrscr( );
printf("enter the number");
scanf("%d",&n);
```

```
k=fact(n);
printf("the factorial of number=%d",k);
getch();
}
int fact(int x)
{
int i,f=1;
for(i=1;i<=x;i++)
{
f=f*i;
}
return(f);
}
```

Experiment No.7

PROGRAM

Using Recursive Function

```
#include<stdio.h>
#include<conio.h>
int gcd (int,int);
void main( )
{
int a,b,k;
clrscr( );
printf("enter two numbers");
scanf("%d%d",&a,&b);
k=gcd(a,b);
printf("the gcd of two numbers is %d",k);
getch( );
}
int gcd(int x,int y)
{
if(y= =0)
{
return (x);
}
else
```

```
{
gcd(y,x%y);
}
}
```

PROGRAM

Using Non-Recursive Function

```
#include<stdio.h>
#include<conio.h>
int gcd (int,int);
void main( )
{
int m,n,k;
clrscr( );
printf("enter two numbers");
scanf("%d%d",&m,&n);
k=gcd(m,n);
printf("the gcd of two numbers is %d",k);
getch( );
}
int gcd(int x,int y)
{
int a,b;
a=x;
b=y;
while(a!=b)
```

```
{
if(a>b)
{
a=a-b;
}
else
{
b=b-a;
}
}
return (a);
}
```

Experiment No.8

PROGRAM

```
#include<stdio.h>
#include<conio.h>
void main( )
{
int a[30],i,n,g,s;
printf(“specify the value of n”);
scanf(“%d”,&n);
printf(“enter the elements”);
for(i=0;i<n;i++)
{
Scanf(“%d”,&a[i]);
}
g=a[0];
s=a[0];
for(i=1;i<n;i++)
{
if(a[i]>g)
{
g=a[i];
}
if(a[i]<s)
```

```
{
s=a[i];
}
}
printf("the greast number=%d",g);
printf("the smallest number=%d",s);
getch();
}
```

Experiment No.9

PROGRAM

```
#include<stdio.h>
#include<conio.h>
void add(int [ ][ ],int [ ][ ]);
void main( )
{
int x[3][3],y[3][3],i,j;
clrscr();
printf("enter elements to 1st matrix");
for(i=0;i<3;i++)
{
for(j=0;j<3;j++)
{
scanf("%d",&x[i][j]);
}
}
printf("enter elements to 2nd matrix");
for(i=0;i<3;i++)
{
for(j=0;j<3;j++)
{
scanf("%d",&y[i][j]);
}
```

```
}
add(x,y);
getch( );
}
void add(int a[ ][ ],int b[ ][ ])
{
int i,j,c[3][3];
for(i=0;i<3;i++)
{
for(j=0;j<3;j++)
{
c[i][j]=a[i][j]+b[i][j];
}
}
printf("the resultant matrix is \n \n");
for(i=0;i<3;i++)
{
for(j=0;j<3;j++)
{
printf("%d\t",c[i][j]);
}
printf("\n");
}
```

Experiment No.10

PROGRAM

```
#include<stdio.h>
#include<conio.h>
void mul(int [ ][ ],int [ ][ ]);
void main( )
{
int x[3][3],y[3][3],i,j;
clrscr();
printf("enter elements to 1st matrix");
for(i=0;i<3;i++)
{
for(j=0;j<3;j++)
{
scanf("%d",&x[i][j]);
}
}
printf("enter elements to 2nd matrix");
for(i=0;i<3;i++)
{
for(j=0;j<3;j++)
{
scanf("%d",&y[i][j]);
}
}
```

```
mul(x,y);
getch( );
}
void mul(int a[ ][ ],int b[ ][ ])
{
int i,j,k,c[3][3];
for(i=0;i<3;i++)
{
for(j=0;j<3;j++)
{
c[i][j]=0;
for(k=;k<3;k++)
{
c[i][j]=c[i][j]+a[i][k]*b[k][j];
}
}
}
printf("the resultant matrix is \n \n");
for(i=0;i<3;i++)
{
for(j=0;j<3;j++)
{
printf("%d\t",c[i][j]);
}
printf("\n");}
```

Experiment No.11

PROGRAM

```
#include<stdio.h>
#include<conio.h>
#include<string.h>
void main( )
{
char a[50],b[50];
int i,k=0;
printf("enter a string");
gets(a);
for(i=strlen(a)-1;i>=0;i- -)
{
b[k++]=a[i];
}
b[k]='\0';
if(strcmp(a,b)= = 0)
{
printf("the string is palindrome");
}
else
{
printf("the string is not palindrome");
}
getch( );}
```

Experiment No.12

PROGRAM

```
#include<stdio.h>
#include<conio.h>
void main( )
{
int i,j;
clrscr( );
for(i=1;i<=4;i++)
{
for(j=4-i;j>=1;j- -)
{
Printf(“  “);
}
for(j=1;j<=i;j++)
{
printf(“%d”,j);
}
for(j=i-1;j>=1;j- -)
{
printf(“%d”,j);
}
printf(“\n”);
}
getch( );}
```

Experiment No.13

PROGRAM

```
#include<stdio.h>
#include<conio.h>
void main( )
{
FILE *fp;
int l=0;s=0;c=0;
char ch;
fp=fopen("x.txt","r");
if (fp= = NULL)
{
printf("error in reading");
exit(0);
}
while(ch=fgetc(fp)!=EOF)
{
c++;
if(ch= ="\n")
{
l++;
}
if(ch==32)
{
s++;
```

```
}
fclose(fp);
printf("total number of characters=%d \n",c);
printf("total number of spaces=%d \n",s);
printf("total number of lines=%d \n",l);
getch( );
}
```

Experiment No.14

PROGRAM

```
#include<stdio.h>
#include<conio.h>
struct complex
{
float real,imag;
} ;
void main( )
{
struct complex c1,c2,c3,c4;
printf("enter the real and imaginary part of 1st complex no");
scanf("%f%f".&c1.real,&c1.imag);
printf("enter the real and imaginary part of 2nd  complex no");
scanf("%f%f".&c2.real,&c2.imag);
printf("the first complex number is %f +i %f  \n",c1.real,c1.imag);
printf("the second complex number is %f +i %f  \n",c2.real,c2.imag);
c3.real=c1.real+c2.real;
c3.imag=c1.imag+c2.imag;
c4.real=c1.real-c2.real;
c4.imag=c1.imag-c2.imag;
printf("\n the result of addition of two complex no is %f +i %f  \n",c3.real,c3.imag);
printf("\n the result of subtraction of two complex no is %f +i %f  \n",c4.real,c4.imag);
getch( );}
```

Experiment No.15

PROGRAM

```
#include<stdio.h>
#include<conio.h>
void main( )
{
FILE *fs,*fd;
char ch;
fs=fopen("x.txt","r");
if (fs= = NULL)
{
printf("error in reading");
exit(0);
}
fd=fopen("y.txt","w");
if (fd= = NULL)
{
printf("error in reading");
exit(0);
}
while(ch=fgetc(fs)!=EOF)
{
fputc(ch,fd);
}
```

```
fclose all ( );
getch( );
}
```