Computer Programming Lab Manual

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WEEK 1

a)Write C program to find the sum of individual digits of a positive integer

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n,x,sum=0;
clrscr();
printf("Enter the value of n:");
scanf("%d",&n);
while(n>0)
{
x=n%10;
sum=sum+x;
n=n/10;
}
printf("%d",sum);
getch();
}
```

b)A Fibonacci sequence is defined as follows: the first nd 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 programs to generate the first n terms of the sequence

```
 #include<stdio.h>
#include<conio.h>
void main()
{
int z,n,x=0,y=1;
clrscr();
printf("Enter the value of n:");
scanf("%d",&n);
printf("%d %d",x,y);
while(n>2)
{
z=x+y;
x=y;
y=z;
printf("%d",z);
n--;
}
getch();
}
```

c)Write a Cprogram to generate all prime numbers between 1 and n,where n is a value supplied by the user.

```
#include<stdio.h>
#include<conio.h>
void main()
{
int i,j,n,c;
clrscr();
printf("Enter the value of n:");
scanf("%d",&n);
for(i=2;i<=n;i++)
{
  c=0;
  for(j=1;j<=i;j++)
  {
   if(i%j==0)
   c++;
  }
  if(c==2)
  printf("%d",i);
}
getch();
}
```

<u>WEEK 2:</u>

a)Write a C program to calculate the following Sum:
sum=1-x^2/2!+x^4/4!....-x^10/10!

```
#include<stdio.h>
#include<conio.h>
#include<math.h>
void main()
{

int i,sign=-1,fact=1;
float  x,sum=1,prod=1;
clrscr();
printf("Enter the value of x:");
scanf("%f",&x);
for(i=2;i<=10;i+=2)
{
  fact=fact*(i-1)*i;
  prod=prod*x*x;
  sum=sum+sign*(prod/fact);
  sign=sign*-1;
}
printf("Sum of series: %f",sum);
getch();
}
```

b)Write a C program to find the roots of quadratic equation

```
#include<stdio.h>
#include<conio.h>
#include<math.h>
void main()
{
  float  a,b,c,d,r1,r2;
  clrscr();
  printf("Enter the value of a,b,c :");
  scanf("%f %f %f",&a,&b,&c);
  d=(b*b)-(4*a*c);
  if(a==0)
  {
   printf("Roots are impossible");
  }
  if(d==0)
  {
   printf("Roots are real and equal");
   r1=-b/2*a;
   r2=-b/2*a;
   printf("%f %f",r1,r2);
  }
  else if(d>0)
  {
   printf("Roots are real and distinct");
   r1=-b/2*a+sqrt(d)/2*a;
   r1=-b/2*a+sqrt(d)/2*a;
  }
  else
  printf("Roots are imaginary");
getch();
}
```

WEEK 3

a)The total distance travelled by vehicle in 't' seconds is given by distance =ut+1/2at^2 where 'u' and 'a' are the initial velocity and acceleration
Write a C program to find the distance travelled at regular intervals of time given the values 'u' and 'a'The program should provide the flexibility to user to select his own time intervals and repeat the calculations for different values of 'u' and 'a'.

```
#include<stdio.h>
#include<conio.h>
#include<math.h>
void main()
{
 int counter,time,i,t;
 float  a,distance,u,sum=0;
 clrscr();
 printf("Enter the total duration time: \n");
 scanf("%d",&time);
 printf("\n Enter the time internal:");
 scanf("%d",&t);

 i=time/t;

 for(counter=1;counter<=1;counter++)
 {
  printf("\n Enter velocity:");
  scanf("%f",&u);
  printf("\n Enter acceleration:");
  scanf("%f",&a);
  distance=u*t+(a*pow(t,2)/2);
  printf("Distance covered in round %d is %f",counter ,distance);
  sum=distance;
  }
 printf("The total distance travelled: %f",sum);
getch();
}
```

b)Write a C program,which taks two integer operands and one operator from the user,performs the operation and then prints the result

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

void main()
{
```

```
int a,b;
int option;
clrscr();

do
{
 printf("\n MENU");
 printf("\n 1.Addition");
 printf("\n 2.Substraction");
 printf("\n 3.Multiplication");
 printf("\n 4.Division");
 printf("\n 5.Modulo");

 printf("\n Choose an option:");
 scanf("%d",&option);

 printf("\n Enter the value for a and b");
 scanf("%d %d",&a,&b);

 switch(option)
 {
  case 1: printf("\n Addition=%d",a+b);
              break;

  case 2: printf("\n Substraction=%d",a-b);
              break;

  case 3: printf("\n Multiplication=%d",a*b);
              break;

  case 4: printf("\n Division=%d",a/b);
              break;

  case 5: printf("\n Modulo=%d",a%b);
              break;
  }

}while(option!=5);
getch();
}
```

WEEK 4

a)Write C programs that use both recursive and non recursive functions

i)To find the factorial of a given integer.

Using Non recursive function:

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

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

Using Recursive function:

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

int fact(int n)
```

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

i)To find the GCD of a given two integer.

Using Non recursive function

```
#include<stdio.h>
#include<conio.h>
int gcd(int,int);
void main()
{
 int num1,num2,res;
 printf("\nEnter two numbers:");
 scanf("%d %d",&num1,&num2);
 res=gcd(num1,num2);
 printf("\n GCD:%d",res);
 getch();
}

int gcd(int m,int n)
{
 int x,i,res;
 x=(m>n)?n:m;
 for(i=1;i<x;i++)
  if((m%i==0)&&(n%i==0))
    res=i;
 return res;
}
```

Using Recursive function:

```
#include<stdio.h>
#include<conio.h>
int gcd(int,int);
void main()
{
 int num1,num2,res;
 printf("\nEnter two numbers:");
 scanf("%d %d",&num1,&num2);
 res=gcd(num1,num2);
 printf("\n GCD:%d",res);
 getch();
}

int gcd(int m,int n)
{
 if(n==0)
  return m;
 else
  return gcd(n,m%n);
}
```

WEEK 5

a)Write a C program to find the largest integer in a list of integers

```
#include<stdio.h>
#include<conio.h>
void main()
{
 int a[10],max,n,i;
 clrscr();
 printf("\nEnter the size of an array:");
 scanf("%d",&n);
 printf("Enter all the element:");
 for(i=0;i<n;i++)
 {
  scanf("%d",&a[i]);
 }
 max=a[0];
 for(i=0;i<n;i++)
 {
  if(max<a[i])
   max=a[i];
 }
 printf("Largest number in the list: %d",max);
 getch();
}
```

b)Write a C program that uses functions to perform the following:
i)addition of two matrices
ii)multiplication of two matrices

i)Addition of two matrices

```
#include<stdio.h>
#include<conio.h>
#include<math.h>
#define rows 3
#define cols 3
void main()
{
 int mat1[rows][cols],mat2[rows][cols],res[rows][cols],r,c;
 clrscr();

 printf("Enter the values for 1st matrix:");
 for(r=0;r<rows;r++)
 {
   for(c=0;c<cols;c++)
   {
    scanf("%d",&mat1[r][c]);
   }
 }

 printf("Enter the values for 2nd matrix:");
 for(r=0;r<rows;r++)
 {
  for(c=0;c<cols;c++)
  {
   scanf("%d",&mat2[r][c]);
  }
 }

 for(r=0;r<rows;r++)
 {
  for(c=0;c<cols;c++)
  {
   res[r][c]=mat1[r][c]+mat2[r][c];
  }
 }

 printf("Resultant matrix:\n");
 for(r=0;r<rows;r++)
 {
  for(c=0;c<cols;c++)
  {
   printf("%d \t",res[r][c]);
  }
  printf("\n");
 }
 getch();
}
```

ii)Multiplication of matrices:

```
#include<stdio.h>
#include<conio.h>
#include<math.h>
#define rows 3
#define cols 3
void main()
{
 int mat1[rows][cols],mat2[rows][cols],res[rows][cols],r,c,n;
 clrscr();

 printf("Enter the values for 1st matrix:\n");
 for(r=0;r<rows;r++)
 {
   for(c=0;c<cols;c++)
   {
    scanf("%d",&mat1[r][c]);
   }
 }

 printf("Enter the values for 2nd matrix:\n");
 for(r=0;r<rows;r++)
 {
  for(c=0;c<cols;c++)
  {
   scanf("%d",&mat2[r][c]);
  }
 }

 for(r=0;r<rows;r++)
 {
  for(c=0;c<cols;c++)
  {
   res[r][c]=0;
   for(n=0;n<rows;n++)
   {
    res[r][c]=res[r][c]+mat1[r][c]*mat2[r][c];
   }
  }
 }

 printf("Resultant matrix:\n");
 for(r=0;r<rows;r++)
 {
  for(c=0;c<cols;c++)
  {
   printf("%d \t",res[r][c]);
  }
  printf("\n");
 }
 getch();
}
```

WEEK 6

a)Write a C program that uses functions to perform the following operations

i)To insert substring into a given main string from from a given string

```
#include<stdio.h>
#include<conio.h>
#include<string.h>
void main()
{
 char mstr[100],sstr[100];
 int n,ls,lm,i,j;
 clrscr();
 printf("Enter main string:");
 scanf("%s",mstr);
 printf("Enter sub string:");
 scanf("%s",sstr);
 printf("Enter position to insert a string:");
 scanf("%d",&n);
 ls=strlen(sstr);
 lm=strlen(mstr);
 for(i=lm;i>=n;i--)
 {
  mstr[i+ls]=mstr[i];
 }
 for(i=n,j=0;j<ls;i++,j++)
 {
  mstr[i]=sstr[j];
 }
 printf("The main string after insertion is %s",mstr);
 getch();
}
```

ii)To delete n characters from a given position in a given string

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

```
#include<conio.h>
#include<string.h>
void main()
{
 char str[100];
 int start,num,i;
 clrscr();
 printf("Enter string:");
 scanf("%s",str);
 printf("Enter start position of deletion:");
 scanf("%d",&start);
 printf("Enter number of character to delete:");
 scanf("%d",&num);
 for(i=start+num;str[i]!='\0';i++)
 {
  str[i-num]=str[i];
 }
 str[i-num]='\0';
 printf("The string after deletion is %s",str);
 getch();
}
```

b)Write a c program to determine if the given string is palindrome or not

```
#include<stdio.h>
#include<conio.h>
#include<string.h>
#define size 20
void main()
{
 char str1[size],str [size];
printf("Enter first string:");
scanf("%s",str1);
printf("Enter second string");
scanf("%s",str2);
strcpy(str2,str1);
strrev(str2);
if(strcmp(str1,str2)==0)
{
printf("%s is a palindrome:",str1);
}
else
printf("%s is not a palindrome", str2);
}
```

WEEK 7

a)Write a C program that displays the position or index in the string S where the string T begins or -1 if S doesnt contain T

```
#include<stdio.h>
#include<conio.h>
#include<string.h>
void main()
{
 char s[30],t[20];
 char *found;
 clrsr();
 puts("Enter the first string:");
 gets(s);
 puts("Enter the string to be searched:");
 gets(t);
 found=strstr(s,t);
 if(found)
 {
  printf("Second string is found at %d position", found-s);
 }
 else
 {
  printf("String is not found");
 }
 getch();
}
```

b)Write a C program to count the lines,words and characters in agiven text

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

void main()
{
 int c=0,l=0,w=0;
 char ch;
 clrscr();
 printf("Enter the text at the end press #: ");
 scanf("%c",&ch);

 do
 {
 scanf("%c",&ch);
 c++;
 if(ch==' ');
  w++;
 if(ch=='\n')
 {
  l++;
  w++;
 }
 }while(ch!='#');

 printf("\n Numbers of characters=%d",c);
 printf("\n Numbers of words=%d",w+1);
 printf("\n Numbers of lines=%d",l+1);

 getch();
 }
```

WEEK 8

a)Write a C progam to generate Pascals Triangle

```
#include<stdio.h>
#include<conio.h>
#include<math.h>
int fact(int);

void main()
{
 int n,i,j,k,t;
 printf("Enter the height of Pascals triangle:");
 scanf("%d",&n);
 for(i=0;i<n;i++)
 {
    for(k=0;k<n-1;k++)
     printf(" ");

    for(j=0;j<=i;j++)
    {
     t=fact(i)/fact(i-j)*fact(j);
     printf("%d",t);
    }

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

int fact(int n)
{
   int i=1;
   int f=1;
   while(i<=n)
   {
    f=f*i;
    i++;
   }
 return f;
}
```

b)Write a C program to construct a Pyramid of numbers

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

void main()
{
 int n,i,j,k;
 printf("Enter the height of the triangle:");
 scanf("%d",&n);
 for(i=0;i<n;i++)
 {
    for(k=0;k<n-i;k++)
     printf(" ");

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

     printf("%d",i);
    }

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

WEEK 9

Write a C program to read two numbers and then compute the sum of geometric proression 1+x+x^2+......+x^n.

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

void main()
{
 int x,n,i,sum=1;
 do
 {
 printf("Enter the value of n:");
 scanf("%d",&n);
 if(n<0)
  printf("Entered vaue is illegal");
 }while(n<0);

 printf("Enter the value for x:");
 scanf("%d",&x);
 for(i=1;i<=n;i++)
 sum=sum+pow(x,i);
 printf("Sum of the given expression: %d",sum);
 getch();
}
```

WEEK 10

a)Write a C program to find 2's complement of a binary number

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

void main()
{
 int i,len,flag=0;
 char bin[30],sbin[30];
 clrscr();
 printf("Enter the binary string:");
 scanf("%s",bin);
 len=strlen(bin);
 for(i=len-1;i>0;i++)
 {
   if(flag==0 && bin[i]=='0')
```

```
     sbin[i]=bin[i];

   else
   {
      if(flag==0 && bin[i]=='1' )
      {
       sbin[i]=bin[i];
       flag=1;
      }
      else
      sbin[i]=(bin[i]=='0')?'1':'0';
      }
      }
      sbin[len]='\0';
 printf("2's complement: %s",sbin);
 getch();
}
```

b)Write a C program to convert a roman numeral to its decimal equivalent

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

void main()
{
 int a[10],len,i,j,k;
 char rom[10];
 clrscr();
 printf("Enter roman number:");
 scanf("%s",rom);
 len=strlen(rom);

 for(i=0;i<len;i++)
 {
  if(rom[i]=='I')
   a[i]=1;
  else if(rom[i]=='V')
   a[i]=5;
  else if(rom[i]=='X')
   a[i]=10;
  else if(rom[i]=='L')
   a[i]=50;
  else if(rom[i]=='C')
```

```
   a[i]=100;
  else if(rom[i]=='D')
   a[i]=500;
  else if(rom[i]=='M')
   a[i]=1000;

  else
  {
    printf("invalid value");
    getch();
    exit(0);
  }
 }
 k=a[len-1];
 for(i=len-1;i>0;i--)
 {
  if(a[i]>a[i-1])
   k=k-a[i-1];
  else if((a[i]==a[i-1])||(a[i]<a[i-1]))
   k=k+a[i-1];
 }

 printf("Decimal equivalent :%d",k);

 getch();
}
```

WEEK 11

Wrie a C program that uses functions to perform the following operations

i)Reading a complex number

ii)Writing a complex number

iii)Addition of two complex number

iv)Multiplication of two complex number

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

struct complex
{
 float a,b;
}

void main()
{
 struct complex c1,c2,c3;
 clrscr();

 printf("Enter the value for a and b in the 1st exprssion (a+ib):");
 scanf("%f %f",&c1.a,&c1.b);
 printf("The 1st exprssion: %f+i%f",c1.a,c1.b);

 printf("Enter the value for a and b in the 2nd exprssion (a+ib):");
 scanf("%f %f",&c2.a,&c2.b);
 printf("The 2nd  exprssion: %f+i%f",c2.a,c2.b);

 printf("Addition: %f+i%f",(c1.a+c2.a),(c1.b+c2.b));
 printf("Multiplication: %f+i%f",((c1.a*c2.a)+(c1.b*c2.b)),((c1.a*c2.b)+(c1.b*c2.a));

 getch();
}
```

WEEK 12

a)Write a C program which copies one file to another

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

void main()
{
 char ch;
 FILE *fp1,*fp2;
 clrscr();

 fp1=fopen("file1.txt","w");
 printf("\n Enter the contents into file1:");
 while((ch=getchar())!='^')
  putc(ch,fp1);
 fclose(fp1);


 fp1=fopen("file1.txt","r");
 fp2=fopen("file2.txt","w");
 while((ch=getc(fp1))!=EOF)
  putc(ch,fp2);
 fclose(fp1);
 fclose(fp2);
```

b)Write a C program to reverse first n characters in a file

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

void main()
{
 char ch;
 FILE *fp1;
 int n,i=0;
 clrscr();

 fp1=fopen("file1.txt","w");
 printf("\n Enter the contents into file:");
 while((ch=getchar())!='^')
  putc(ch,fp1);
 fflush(stdin);

 printf("\n Enter the number of characters to be reversed:");
 scanf("%d",n);

 fseek(fp1,n,0);

 while(i<n)
 {
  ch=getc(fp1);
  printf("%c",ch);
  fseek(fp1,-1,1);
  i++;
 }

 fseek(fp1,n+1,0);
 while((ch=getc(fp1))!=EOF)
  printf("%c",ch);
 fclose(fp1);

 getch();
 }




 fp2=fopen("file2.txt","r");
 printf("\n The contents of file2:");
 while((ch=getc(fp2))!=EOF)
  printf("%c",ch);
 fclose(fp2);

 getch();
 }
```

WEEK 13

a)Write a c program to display the contents of a file

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

void main()
{
 char ch;
 FILE *fp1;
 clrscr();

 fp1=fopen("file1.txt","w");
 printf("\n Enter the contents into file:");
 while((ch=getchar())!='^')
  putc(ch,fp1);
 fclose(fp1);


 fp1=fopen("file1.txt","r");
 printf("\n The contents of file:");
 while((ch=getc(fp1))!=EOF)
  printf("%c",ch);
 fclose(fp1);

 getch();
 }
```

b)Write a cprogram to merge two files into a third file

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

void main()
{
 char ch;
FILE *fp1,*fp2,*fp3;
clrscr();

fp1=fopen("file1.txt","w");
printf("\n Enter the contents into file1:");
while((ch=getchar())!='^')
 putc(ch,fp1);
fclose(fp1);


fp2=fopen("file2.txt","w");
printf("\n Enter the contents into file2:");
while((ch=getchar())!='^')
 putc(ch,fp2);
fclose(fp2);

fp1=fopen("file1.txt","r");
fp2=fopen("file2.txt","r");
fp3=fopen("file3.txt","w");

while((ch=getc(fp1))!=EOF)
 putc(ch,fp3);
while((ch=getc(fp2))!=EOF)
 putc(ch,fp3);

  fclose(fp1);
  fclose(fp2);
  fclose(fp3);

 fp3=fopen("file3.txt","r");
 printf("\n The contents of file3:");
  while((ch=getc(fp3))!=EOF)
 printf("%c",ch);
fclose(fp3);

getch();
}
```

WEEK 14

a)Write a C program to search a key value in a given list of integers using LINEAR SEARCH

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

int linearsearch(int[],int,int);

void main()
{
 int a[25],n,i,k;
 clrscr();

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

 printf("Enter the elements into array:");
 for(i=0;i<n;i++)
  scanf("%d",&a[i]);

 printf("Enter the number to be searched:");
 scanf("%d",&k);

 if(linearsearch(a,n,k))
 printf("found");
 else
 printf("Not found");

 getch();
}

int linearsearch(int a[],int m,int key)
{
 int i;
 for(i-0;i<m;i++)
 {
  if(x[i]==key)
  return 1;
  else
  return 0;
 }
}
```

b)Write a C program to search a key value in a given list of integers using BINARY SEARCH

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

sort(int[],int);

void main()
{
 int a[25],n,i,j,k,temp;
 int low,mid,high;
 clrscr();

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

 printf("Enter the elements into array:");
 for(i=0;i<n;i++)
  scanf("%d",&a[i]);

 sort(a,n);

 printf("Enter the number to be searched:");
 scanf("%d",&k);

 low=0;
 high=n-1;

 do
 {
 mid=(low+high)/2;

 if(k<a[mid])
   high=mid-1;

 else if(k>a[mid])
   low=mid+1;

 }while(k!=a[mid] && low<=high);

 if(k==a[mid])

 printf("found");
 else
 printf("Not found");

 getch();
}

sort(int x[],int n)
{
 int temp,i,j;
 for(i=0;i<n;i++)
 {
  for(j=0;j<n-i-1;j++)
  {
   if(x[j]>x[j+1])
   {
    temp=x[j];
    x[j]=x[j+1];
    x[j+1]=temp;
   }
  }
 }
}
```

WEEK 15

a)Write a c program that implement SELECTION sort method to sort a in a given array of integers

```
#include<stdio.h>
#include<conio.h>
void main()
{
 int a[25],n,i,j,temp;
 clrscr();

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

 printf("Enter the elements into array:");
 for(i=0;i<n;i++)
  scanf("%d",&a[i]);

 for(i=0;i<n-1;i++)
 {
  for(j=i+1;j<n;j++)
  {
   if(a[i]>a[j])
   {
    temp=a[i];
    a[i]=a[j];
    a[j]=temp;
   }
  }
 }
 printf("Elements after sorting:");
 for(i=0;i<n;i++)
 printf("%d",a[i]) ;

getch();
}
```

b)Write a c program that implement BUBBLE sort method to sort a in a given array of integers

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

void main()
{
 int a[25],n,i,j,temp;
 clrscr();

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

 printf("Enter the elements into array:");
 for(i=0;i<n;i++)
  scanf("%d",&a[i]);

 for(i=0;i<n;i++)
 {
  for(j=0;j<n-i-1;j++)
  {
   if(a[j]>a[j+1])
   {
    temp=a[j];
    a[j]=a[j+1];
    a[j+1]=temp;
   }
  }
 }
 printf("Elements after sorting:");
 for(i=0;i<n;i++)
 printf("%d",a[i]) ;
getch();
}
```

WEEK 16:

Write a c program that uses functions to perform the following:
a)Create a singly linked list of integers
b)Display the contents of the above list

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

struct node
{
int data;
struct node* link;
}*temp,*header,*newnode;
int no=0;
void main()
{
int c;
clrscr();
do
{
printf("\n 1.Creation \n 2.Insertion  \n 3.Transverse  \n 4.Delete  \n 5.Exit");
printf("\n Enter your choice:");
scanf("%d",&c);
switch(c)
{
 case 1: if(no==0)
 {
 temp=(struct node*)malloc(1);
 printf("\n Enter the value");
 scanf("%d",&temp->data);
 temp->link=NULL;
 header=temp;
 no++;
 }
 else
 printf("already exist");
 break;

 case 2:

 if(no==0)
 printf("list do not exist");
 else
 {
 temp=header;
 while(temp->link!=NULL)
 temp=temp->link;
 newnode=(struct node*)malloc(1);
 printf("\n Enter data");
 scanf("%d",&newnode->data);
 newnode->link=NULL;
 temp->link=newnode;
 no++;
 }
 break;

  case 3:
  printf("\n Data in list:" );
  temp=header;
  while(temp!=NULL)
  {
  printf("%d",temp->data);
  temp=temp->link;
  }
 break;
}
  }while(c!=3);
  getch();
  }
```

WEEK 17

Write a C program that implements STACK using a singly linked list to display a list of integers

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

struct node
{
 int data;
 struct node *link;
}*top,*cur,*newnode;

void push(int);
void pop();
void display();

void main()
```

```
{
 int option,item;
 top=NULL;

 do
 {
  clrscr();
  printf("\n MENU");
  printf("\n 1.Push");
  printf("\n 2.Pop");
  printf("\n 3.Display");
  printf("\n Choose an option: ");
  scanf("%d",&option);

  switch(option)
  {
   case 1: printf("Enter data item:");
                scanf("%d",&item);
                push(item);
                display();
                getch();
                break;

   case 2: pop();
                display();
                getch();
                break;

   case 3: display();
                getch();
                break;



  }
  }while(option!=3);
  }

  void push(int value)
  {
  newnode=(struct node*)malloc(sizeof(struct node));
  newnode->data=value;
  if(top==NULL)
  {
  top=newnode;
  top->link=NULL;
  }
  else
  {
  newnode->link=top;
  top=newnode;
  }
  }

  void pop()
  {
   cur=top;
   if(cur==top)
   {
    top=top->link;
    free(cur);
   }
   else
    printf("\n Stack is empty");
  }

 void display()
  {
   printf("Elements in the stack:");
   cur=top;
   while(cur!=NULL)
   {
   printf("\n %d",cur->data);
   cur=cur->link;
   }

  }
```

WEEK 18

Write a C program that implements QUEUE using a singly linked list to display a list of integers

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

struct node
{
 int data;
 struct node *link;
```

```
}*rear,*front,*cur,*newnode;

void enqueue(int);
void dequeue();
void display();

void main()
{
 int option,item;
 front=NULL;
 rear=NULL;
 do
 {
  clrscr();
  printf("\n MENU");
  printf("\n 1.Enqueue");
  printf("\n 2.Dequeue");
  printf("\n 3.Display");
  printf("\n Choose an option: ");
  scanf("%d",&option);

  switch(option)
  {
   case 1: printf("Enter data item:");
            scanf("%d",&item);
            enqueue(item);
            display();
            getch();
            break;

   case 2: dequeue();
            display();
            getch();
            break;

   case 3: display();
            getch();
            break;


  }
  }while(option!=3);
  }

  void enqueue(int value)
  {
```

```
newnode=(struct node*)malloc(sizeof(struct node));
newnode->data=value;
newnode->link=NULL;
if(rear==NULL)
{
 front=newnode;
 rear=front;
}
else
rear->link=newnode;
rear=newnode;
}

void dequeue()
{
 cur=front;
 if(cur==front)
 {
    front=front->link;
    free(cur);
 }
 else
  printf("\n Stack is empty");
}

void display()
{
 printf("Elements in the stack:");
 cur=front;
 while(cur!=NULL)
 {
 printf("\n %d",cur->data);
 cur=cur->link;
 }

}
```