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CLASS:- B.E - 4
ROLL NO:- 04
BATCH:- A

EXPERIMENT 5

SOURCE CODE:

Linear Convolution:

```
#include<stdio.h>
#include<conio.h>
void main()
{
      float x[15],h[15],y[15];
      int i,j,m,n;
      clrscr();
      printf("enter value for m:");
      scanf("%d",&m);
      printf("enter value for n:");
      scanf("%d",&n);
      printf("enter the value of x(n):");
      for(i=0;i<m;i++)
      {
            scanf("%f",&x[i]);
      }

      printf("enter the value of h(n):");

      for(i=0;i<n;i++)
      {
            scanf("%f",&h[i]);
      }
      for(i=m;i<=m+n-1;i++)
      {
            x[i]=0;
      }
      for(i=n;i<=m+n-1;i++)
      {
            h[i]=0;
      }
      for(i=0;i<=m+n-1;i++)
      {
            y[i]=0;
            for(j=0;j<=i;j++)
            {
                  y[i]=y[i]+(x[j]*h[i-j]);
                  printf("%f",y[i]) ;
            }
```

```
	}
	for(i=0;i<m+n-1;i++)
	{
		printf("y[%d]=%f\n",i,y[i]);
	}
	getch();
}
```

OUTPUT:

```
enter value for m:4
enter value for n:4
enter the value of x(n):1
1
1
1
enter the value of h(n):1
1
1
1

 y[0]=1.000000
 y[1]=2.000000
 y[2]=3.000000
 y[3]=4.000000
 y[4]=3.000000
 y[5]=2.000000
 y[6]=1.000000
```

Circular Convolution:

```
#include<conio.h>
#include<stdio.h>
void main()
{
            int m,n,x[30],h[30],y[30],i,j, k,x2[30],a[30];
            clrscr();
            printf(" enter the length of the first sequence\n");
            scanf("%d",&m);
            printf(" enter the length of the second sequence\n");
            scanf("%d",&n);
            printf(" enter the first sequence\n");
            for(i=0;i<m;i++)
                        scanf("%d",&x[i]);

            printf(" enter the second sequence\n");
            for(j=0;j<n;j++)
                        scanf("%d",&h[j]);

            if(m-n!=0)        /*If length of both sequences are not
equal*/
            {
                        if(m>n)                         /* Pad the
smaller sequence with zero*/
                        {
                        for(i=n;i<m;i++)
                                    h[i]=0;
                                    n=m;
                        }
                        for(i=m;i<n;i++)
                                    x[i]=0;
                                    m=n;
            }
            y[0]=0;
            a[0]=h[0];
            for(j=1;j<n;j++)            /*folding h(n) to h(-n)*/
                        a[j]=h[n-j];
            /*Circular convolution*/
            for(i=0;i<n;i++)
                        y[0]+=x[i]*a[i];
            for(k=1;k<n;k++)
            {
                        y[k]=0;
```

```
                        /*circular shift*/

                        for(j=1;j<n;j++)
                                    x2[j]=a[j-1];
                                    x2[0]=a[n-1];
                        for(i=0;i<n;i++)
                        {
                                    a[i]=x2[i];
                                    y[k]+=x[i]*x2[i];
                        }
            }
            /*displaying the result*/
            printf(" the circular convolution is\n");
            for(i=0;i<n;i++)
                        printf("%d \t",y[i]);
            getch();
}
```

OUTPUT:

```
 enter the length of the first sequence
4
 enter the length of the second sequence
4
 enter the first sequence
1
-1
2
-4
 enter the second sequence
1
2
0
0
 the circular convolution is
-7      1       0       0
```