PNS SCHOOL OF ENGINEERING & TECHNOLOGY
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LAB MANUAL FOR
DATA STRUCTURE USING C

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
3RD SEMESTER

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1.Aim: To display fibounacci series up to a range.

```
#include<stdio.h>

void main()
{
        int a,b,c,n;
        printf("\nEnter range:");
        scanf("%d",&n);
        a=0,b=1,c=0;
        printf("%d \t %d",a,b);
        c=a+b;
        while(c<=n)
        {
                printf("\t%d",c);
                a=b;
                b=c;
                c=a+b;
        }
}
```

Output:

2. Aim: To read n numbers and display it.

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

void main()
{
        int i,n, a[10];
        printf("\nEnter the number of element : \n");
        scanf("%d",&n);
        printf("Enter element: \n");
        for(i=0;i<n;i++)
        {
                printf("a[%d]=",i);
                scanf("%d",&a[i]);
        }
        printf("\n Display array element: \n");
        for(i=0;i<n;i++)
        {
                printf("a[%d]=%d\n",i,a[i]);

        }
}
```

Output:

3. Aim: To demonstrate the concept of one dimentional array finding the sum of array elements.

```
#include<stdio.h>
void  main()
{
        int i,n, a[10],s;
        printf("Enter the number of element :\n");
        scanf("%d",&n);
        s=0;
        printf("Enter element:\n");
        for(i=0;i<n;i++)
        {
                printf("a[%d]=",i);
                scanf("%d",&a[i]);
                s=s+a[i];
        }
        printf("Sum of arrary element:%d",s);
```

Output:

4. Aim: To insert an element in an array.

```
#include<stdio.h>
#include<
{
        int i,n,pos,num, a[10];
        printf("Enter the number of element :\n");
        scanf("%d",&n);
        printf("Enter element:\n");for(i=0;i<n;i++)
        {
                printf("a[%d]=",i);
                scanf("%d",&a[i]);
        }
        printf("\nEnter the pos where the no. is to be inserted :");
        scanf("%d",&pos);
        printf("\nEnter  the the no. is to be inserted  :");
        scanf("%d",&num);
        for(i=n-1;i>=pos;i--)
        {
                a[i+1]=a[i];
                n=n+1;
                a[pos]=num;
        }
        printf("\n Display array after insertion:\n");
        for(i=0;i<n;i++)
        {
                printf("a[%d]=%d\n",i,a[i]);
        }
}
```

Output:

```
Enter  the number of  element :4

Enter  element:
a[0]=10
a[1]=22
a[2]=33
a[3]=44

Enter  the pos where the no. is to be inserted :2

Enter  the the no. is to be inserted  :90

 Display  array  after insertion:
a[0]=10
a[1]=22
a[2]=90
a[3]=33
a[4]=44
```

5. To delete an element from an array.

```
#include<stdio.h>
void  main()
{
        int i,n,pos, a[10];
        printf("Enter the number of elements :\n");
        scanf("%d",&n);
        printf("Enter element: \n ");
        for(i=0;i<n;i++)
        {
                printf("a[%d]=",i);
                scanf("%d",&a[i]);
        }
        printf("\nEnter  the pos from which  the no. has  to be deleted :");
        scanf("%d",&pos);
        for(i=pos;i<n;i++)
        {
                a[i]=a[i+1];
                n=n-1;
        }
        printf("\n Displar array after deletion: \n ");
        for(i=0;i<n;i++)
        {
                printf("\n a[%d]=%d",i,a[i]);
        }
}
```

Output:

```
Enter  the number of  elements :7
Enter  element:a[0]=12
a[1]=23
a[2]=43
a[3]=25
a[4]=78
a[5]=45
a[6]=14

Enter  the pos from which  the no. has  to be deleted :4

 Displar array after deletion:
 a[0]=12
 a[1]=23
 a[2]=43
 a[3]=25
 a[4]=45
 a[5]=14
```

6. Aim: To add two matrix A and B.

```
#include<stdio.h>
void main()
{
	int i,j,m,n,p,q;
	int a[10][10], b[10][10], c[10][10];
	printf("\nEnter no of rows and column of matrixA:");
	scanf("%d%d",&m,&n);
	printf("\nEnter no of rows and column of matrixB:");
	scanf("%d%d",&p,&q);
	if(m!=p && n!=q)
	{
		printf("\n Matrix
		cannot be added.");
		exit(0);
	}
	printf("\n Matrix can be added");
	printf("\n Enter elements of matrix A:");
	for(i=0;i<m;i++)
	{
		for(j=0;j<n;j++)
		{
			scanf("%d",&a[i][j]);
		}
	}
	printf("\n Enter elements of matrix B:");
	for(i=0;i<p;i++)
	{
		for(j=0;j<q;j++)
		{
			scanf("%d",&b[i][j]);
		}
	}
	for(i=0;i<m;i++)
	{
		for(j=0;j<n;j++)
		{
			c[i][j]=a[i][j]+b[i][j];
		}
	}
	printf("\n Display matrix A:\n");
	for(i=0;i<m;i++)
	{
		for(j=0;j<n;j++)
		{
			printf("%d\t",a[i][j]);printf("\n");
		}
	}

	printf("\n Display matrix B:\n");
	for(i=0;i<p;i++)
	{
```

```
                for(j=0;j<q;j++)
                {
                        printf("%d\t",b[i][j]);
                        printf("\n");
                }
        }
        printf("\n Display matrix C:\n");
        for(i=0;i<p;i++)
        {
                for(j=0;j<q;j++)
                {
                        printf("%d\t",c[i][j]);printf("\n");
                }
        }
}
```

Output:

```
Enter no of rows and column of matrixA:3
3
Enter no of rows and column of matrixB:3
3

 Matrix can be added
 Enter elements of matrix A:1
2
3
4
5
6
7
8
9

 Enter elements of matrix B:1
2
3
4
5
6
7
8
9
```

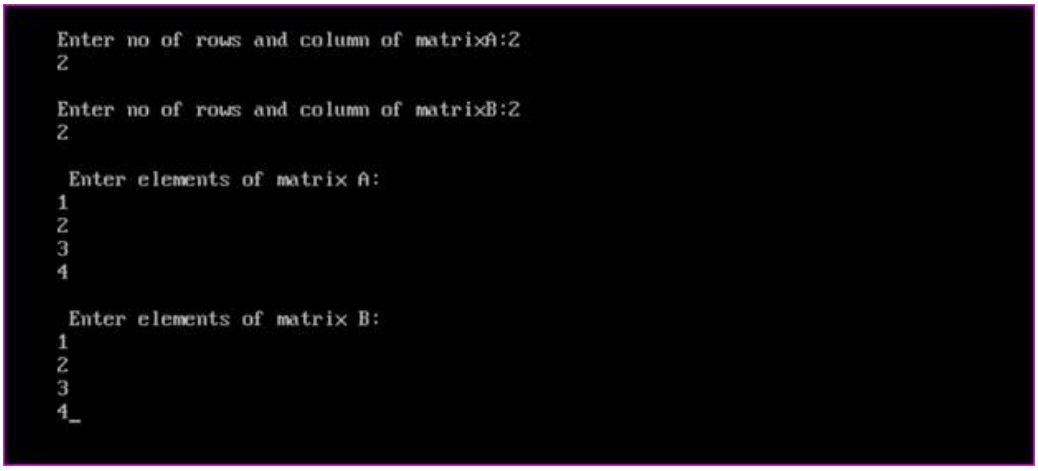
```
 Enter elements of matrix B:1
2
3
4
5
6
7
8
9

 Display matrix A:
1       2       3
4       5       6
7       8       9

 Display matrix B:
1       2       3
4       5       6
7       8       9

 Display matrix C:
2       4       6
8       10      12
14      16      18
```

7.Aim: To multiply two matrix A and B.

```
#include<stdio.h>
`void main()
{
	int i,j,m,n,p,q,k;
	int a[10][10], b[10][10], c[10][10];
	printf("\nEnter no of rows and column of matrixA:");
	scanf("%d%d",&m,&n);
	printf("\nEnter no of rows and column of matrixB:");
	scanf("%d%d",&p,&q);
	printf("\n Enter elements of matrix  A:\n");
	for(i=0;i<m;i++)
	{
		for(j=0;j<n;j++)
		{
			scanf("%d",&a[i][j]);
		}
	}
	printf("\n Enter elements of matrix B:\n");



	for(i=0;i<p;i++)
	{
		for(j=0;j<q;j++)
		{
			scanf("%d",&b[i][j]);
		}
	}
	if(n==p)
	{
		for(i=0;i<m;i++)
		{
			for(j=0;j<q;j++)
			{
				c[i][j]=0;
				for(k=0;k<n;k++)
				{
					c[i][j]=c[i][j]+(a[i][k]*b[k][j]);
				}
			}
		}
	}
```

```
        else
        {
                printf("\n Matrix  cannot be multiplied");
                exit(1);
        }
        printf("\n Display matrix A:\n");
        for(i=0;i<m;i++)
        {
                for(j=0;j<n;j++)
                        printf("%d\t",a[i][j]);
                printf("\n");
        }
        printf("\n Display matrix B:\n");
        for(i=0;i<p;i++)
        {
                for(j=0;j<q;j++)
                         printf("%d\t",b[i][j]);
                printf("\n");
        }
        printf("\n Display Product:\n");


        for(i=0;i<m;i++)
        {
                for(j=0;j<q;j++)
                        printf("%d\t",c[i][j]);
                printf("\n");
        }

}
```

Output:



```
 Display matrix A:
1       2
3       4

 Display matrix B:
1       2
3       4

 Display Product:
7       10
15      22
```

8.Aim: To Concatenate two string.

```
#include<stdio.h>
 #include<string.h>
void  main()
 {
        char str[20],str1[20],str2[20];
        int i,j;
        i=j=0;
        printf("\n Enter 1st string:");
        scanf("%s",&str);
        printf("\n Enter 2nd string:");
        scanf("%s",&str1);
        while(str[i]!='\0')
         {
                str2[i]=str[i];i++;
         }

        while(str1[j]!='\0')
         {
                str2[i]=str1[j];
                i++;
                j++;
         }
        str2[i]='\0';
        printf("\n Resultant string is:%s",str2);
 }
```

Output:

```
Enter 1st string:Womens

Enter 2nd string:Polytechnic

Resultant string is:WomensPolytechnic
```

9. Aim: To copy a string into another string.

```
#include<stdio.h>
 #include<string.h>
void  main()
 {
        char str[20],str1[20];
        int i ;
        i=0;
        printf("\n Enter string to copy:");
        scanf("%s",&str);
        while(str[i]!='\0')
         {
                str1[i]=str[i];
                i++;
         }
        str1[i]='\0';
        printf("\n The Destination  string is:%s",str1);
}
```

Output: