Program-3

(Creation of an Array)

```c
#include<stdio.h>
main()
{
        int a[100],i,n;
        printf("Name : Aditya \n Roll Number : 25424");
        printf("\nEnter the number of elements of array:\n");
        scanf("%d",&n);
        printf("\n Enter the elements of array:\n");
        for(i = 0 ; i < n ; i++)
        scanf("%d",&a[i]);
        printf("\n You Entered : \n");
        for(i = 0 ; i < n ; i++)
        {
        printf(" %d",a[i]);
        printf("\n");
        }
        return 0;

}
```

Output

Name : Aditya
 Roll Number : 25424
Enter the number of elements of array:
5
Enter the elements of array:
6
9
7
3
5
You Entered :
 6
 9
 7
 3
 5

Program-5
(Delete element from Array)

```c
 #include<stdio.h>
main()
{
        int a[100], pos, i, n;
        printf("Name : Aditya \n  Roll No. : 25424\n");
        printf("Enter the number of elements of array:\n");
        scanf("%d",&n);
        printf("Enter %d elements of array:\n",n);
        for(i=0;i<n;i++)
        {
                printf(" \t a[%d] = ",i);
                scanf("%d",&a[i]);
        }
        printf("\n \t Enter the position whose element is to be removed : ");
        scanf("%d",&pos);
        if(pos >= n+1 )
        {
                printf("\n Deletion is not possible in array.");
        }
        else
        {
                for(i=(pos-1);i<(n-1);i++)
                {
                        a[i]=a[i+1];
                }
                printf("\n The resultant array is :\n");
                for(i=0;i<n-1;i++)
                {
                        printf(" \t arr[%d] = ",i);
                        printf(" %d \n",a[i]);
                }
        }
        return 0;
}
```

Output
Name : Aditya
Roll No. : 25424
Enter the number of elements of array: 5
Enter 5 elements of array:
        a[0] = 6
        a[1] = 2
        a[2] = 9
        a[3] = 8
        a[4] = 4
Enter the position whose element is to be removed : 9
Deletion is not possible in array.

Program-1
(Call by value)

```c
#include <stdio.h>
void swap(int, int);
int main()
{
   int x, y;
   printf("\nName : Aditya \nRoll Number : 25424");
   printf("\nEnter the value of x and y\n");
   scanf("%d%d",&x,&y);
   printf("\t Before Swapping:\n x = %d\n y = %d\n", x, y);
   swap(x, y);
   printf("After Swapping:\n x = %d\n y = %d\n", y, x);
   return 0;
}
void swap(int a, int b)
{
   int temp;
   temp = b;
   b = a;
   a = temp;
    printf("Values of a and b is %d and %d respectively.\n",a,b);
}
```

Output

Name : Aditya
Roll Number : 25424
Enter the value of x and y
10
65
Before Swapping:
x = 10
 y = 65
 Values of a and b is 65 and 10 respectively.
After Swapping:
 x = 65
 y = 10

Program - 2
(Call by Refrence)

```c
#include <stdio.h>

void swap(int *, int *);

int main()
{
    int a = 10;

    int b = 20;

    printf("\n Name : Aditya \nRoll no. : 25424\n ");

    printf("\nBefore swapping the values in main a = %d, b = %d\n",a,b);

    swap(&a,&b);

    printf("After swapping values in main a = %d, b = %d\n",a,b);
}

void swap (int *a, int *b)
{
    int temp;

    temp = *a;

    *a=*b;

    *b=temp;

    printf("After swapping values in function a = %d, b = %d\n",*a,*b);
}
```

Output

Name : Aditya
Roll no. : 25424
Before swapping the values in main a = 10, b = 20
After swapping values in function a = 20,b = 10
After swapping values in main a = 20, b = 10

Program-5
(Insert elements into Array)

```c
#include<stdio.h>
int main()
{
        int i,n,pos,val,a[100];
        printf("\n    Name : Aditya \n Roll no. :  25424") ;
        printf("\n Enter the number of elements : ");
        scanf("%d",&n);
        printf("\n Enter the elements  : ");
        for(i=0;i<n;i++)
        scanf("%d",&a[i]);
        printf("\n Enter the position you want to add element :");
        scanf("%d",&pos);
        printf("\n Enter the value you want to add : ");
        scanf("%d",&val);
        for(i=n-1;i>=pos-1;i--)
        a[i+1]=a[i];
        a[pos-1]=val;
        printf("\n NEW array:");
        for(i=0;i<=n;i++)
        printf(" %d\t",a[i]);
        return 0;
}
```

Output

```
Name : Aditya
Roll no. :  25424
Enter the number of elements : 5
Enter the elements  : 2
6
9
15
3
Enter the position you want to add element :4
Enter the value you want to add : 8
NEW array: 2        6       9       8       15      3
```

Program-6

(linear search)

```c
#include <stdio.h>
void main()
{
    int num;
    int i,  key , found = 0;
    printf("\n    Name : Aditya \n Roll no. :  25424") ;
    printf("\n Enter the number of elements :  ");
    scanf("%d", &num);
    int array[num];
    printf("\n Enter the elements  : ");
    for (i = 0; i < num; i++)
    {
        scanf("%d", &array[i]);
    }
    printf("\n Enter the element to be searched :  ");
    scanf("%d", &key);
    for (i = 0; i < num ; i++)
    {
        if (key == array[i] )
        {
            found = 1;
            break;
        }
    }
    if (found == 1)
        printf("\n Element is present in the array at position %d",i+1);
    else
        printf("\n Element is not present in the array\n");
}
```

Output
Name : Aditya
Roll no. : 25424
Enter the number of elements : 5
Enter the elements :1
5
9
7
3
Enter the element to be searched : 9
Element is present in the array at position : 3

Program-7
(binary search)

```c
#include<stdio.h>
int main()
{
    int c, first, last, middle, n, search, array[100];
    printf("\n    Name : Aditya \n  Roll no. :  25424") ;
    printf("\nEnter number of elements\n");
    scanf("%d",&n);
    printf("Enter %d integers\n", n);
    for ( c = 0 ; c < n ; c++ )
        scanf("%d",&array[c]);
    printf("Enter value to find\n");
    scanf("%d",&search);
    first = 0;
    last = n - 1;
    middle = (first+last)/2;
    while( first <= last )
    {
        if ( array[middle] < search )
            first = middle + 1;
        else if ( array[middle] == search )
        {
            printf("%d found at location %d.\n", search, middle+1);
            break;
        }
        else
            last = middle - 1;
        middle = (first + last)/2;
    }
    if ( first > last )
        printf("Not found! %d is not present in the list.\n", search);
    return 0;
}
```

Output
Name : Aditya
 Roll no. : 25424
Enter number of elements : 5
Enter 5 integers : 6
7
10
13
15
Enter value to find : 10
10 found at location 3.

Program-8
(selection sort)

```c
#include <stdio.h>
void swap(int *xp, int *yp)
{
        int temp = *xp;
        *xp = *yp;
        *yp = temp;
}

void selectionSort(int arr[], int n)
{
        int i, j, min_idx;
        for (i = 0; i < n-1; i++)
        {
        min_idx = i;
        for (j = i+1; j < n; j++)
        if (arr[j] < arr[min_idx])
        min_idx = j;
        swap(&arr[min_idx], &arr[i]);
        }
}
void printArray(int arr[], int size)
{
        int i;
        for (i=0; i < size; i++)
        printf("%d ", arr[i]);
        printf("\n");
}
int main()
{
        int i;
        int arr[] = {64, 25, 12, 22, 11};
        printf("\n Name : Aditya \n Roll no. :  25424") ;
        printf("\n Unorder array\n");
        for(i=0; i<5; i++)
        printf("%d\t",arr[i]);
        int n = sizeof(arr)/sizeof(arr[0]);
        selectionSort(arr, n);
        printf("\n Sorted array : ");
        printArray(arr, n);
        return 0;
}
```

Output
Name : Aditya
Roll no. : 25424
unorder array = 64   25   12   22   11
Sorted array : 11 12 22 25 64

Program-9
(bubble sort)

```c
#include <stdio.h>
int main()
{
    int  n, j, i, swap;
    printf("\n Name : Aditya \n  Roll no. :  25424");
    printf("\n Enter number of elements :");
    scanf("%d", &n);
    int array[n];
    printf("\n Enter %d integers\n", n);
    for (i= 0; i < n; i++)
    {
        scanf("%d", &array[i]);
    }
    for (i = 0 ; i < n - 1; i++)
    {
        for (j = 0 ; j < n - i- 1; j++)
        {
            if (array[j] > array[j+1])
            {
                swap     = array[j];
                array[j]   = array[j+1];
                array[j+1] = swap;
            }
        }
    }
        printf("\n Sorted list in ascending order: ");

    for (i = 0; i < n; i++)
        printf("%d\n", array[i]);
    return 0;
}
```

Output
Name : Aditya
Roll no. : 25424
Enter number of elements : 5
Enter 5 integers : 35
14
52
86
35
Sorted list in ascending order : 14
35
35
52
86

Program-10
(insertion sort)

```c
#include <math.h>
#include <stdio.h>
void insertionSort(int arr[], int n)
{
        int i, key, j;
        for (i = 1; i < n; i++)
        {
        key = arr[i];
        j = i - 1;
        while (j >= 0 && arr[j] > key)
        {
        arr[j + 1] = arr[j];
        j = j - 1;
        }
        arr[j + 1] = key;
        }
}
void printArray(int arr[], int n)
{
        int i;
        for (i = 0; i < n; i++)
                printf("\n%d ", arr[i]);
        printf("\n");
}
int main()
{
        int arr[] = {12, 11, 13, 5, 6};
    printf("\n    Name : Aditya \n Roll no. :  25424\n") ;
        printf("\n Unsorted array : ");
        for(int i=0; i<5; i++)
        printf("%d\t",arr[i]);
        printf("\n Sorted array :");

        int n = sizeof(arr) / sizeof(arr[0]);

        insertionSort(arr, n);
        printArray(arr, n);
        return 0;
}
```

Output

```
Name : Aditya
Roll no. : 25424
Unsorted array : 12        11        13        5        6
Sorted array :
5
6
11
12
13
```