// To Implement Bubble Sort , Insertion Sort , Selection Sort

#include<stdio.h>

#include<stdlib.h>

int i,j;

void BubbleSort(int A[] , int N)

{

  int temp;

  for(i=0;i<N-1;i++)

  {

    for(j=0;j<N-1-i;j++)

    {

      if(A[j] > A[j+1])

      {

        temp = A[j];

        A[j] = A[j+1];

        A[j+1] = temp;

      }

    }

  }

  printf("Array After Bubble Sort :\n");

  //Displaying

  for(i=0;i<N;i++)

  {

    printf("%d\t",A[i]);

  }

  printf("\n");

}

void SelectionSort(int A[] , int N)

{

  int min,temp,loc;

  for(i=0;i<N;i++)

  {

    min = A[i]; //setting minimum as the first value

    loc = i;

    for(j=i+1;j<N;j++)

    {

      if(A[j]<min)

      {

        min = A[j];

        loc = j;

      }

    }

    //Swapping after determining the minimum value

    temp = A[i];

    A[i] = A[loc];

    A[loc] = temp;

  }

  //Printing

  printf("Array After Selection Sort :\n");

  for(i=0;i<N;i++)

  {

    printf("%d\t",A[i]);

  }

  printf("\n");

}

void InsertionSort(int A[] , int N)

{

  int key;

  for(i=1;i<N;i++)

  {

    key = A[i];

    j=i-1;

    while(j>=0 && A[j] >key) //A[j] here refers to the previous element , if previous element is greater - then it changes the current element with previous element

      //Predessor checking goes on till A[j] > key & till j reaches 0.

    {

      A[j+1] = A[j];

      j--;

    }

    A[j+1] = key; //if above condition is false , then j never gets decremented

  }

  printf("Array After Insertion Sort :\n");

  for(i=0;i<N;i++)

  {

    printf("%d\t",A[i]);

  }

  printf("\n");

}

void Display(int A[],int N)

{

  printf("The Array Is:\n");

  for(i=0;i<N;i++)

  {

    printf("%d\t",A[i]);

  }

  printf("\n");

}

void main()

{

  int A[50],N,ch;

  printf("Enter the Number of elements:");

  scanf("%d",&N);

  printf("Enter an Array:\n");

  for(i=0;i<N;i++)

    scanf("%d",&A[i]);

  printf(" Sorting Menu :\n");

  printf("1.Insertion Sort \n2.Bubble Sort\n3.Selection Sort\n4.Display\n5.Exit\n");

  printf("Enter Your Choice:\n");

  scanf("%d",&ch);

  while(ch<=4)

  {

    switch(ch)

    {

      case 1 : InsertionSort(A,N);

           break;

      case 2 : BubbleSort(A,N);

           break;

      case 3 : SelectionSort(A,N);

           break;

      case 4 : Display(A,N);

           break;

    }

    printf("Enter Your Choice Again :\n");

    scanf("%d",&ch);

  }

}

**Output :**

