# AOA Assignment 1

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**Aim- Write a program to implement Insertion Sort and Selection Sort**

**Problem statement:**
Write a menu driven program to implement Insertion sort and Selection Sort as part of the menu. Input at least 10 values to the array to sort. Input separately for both the algorithms.Values can be input manually or by generating random numbers. Show all passes and the final sorted array for both the algorithms.

**Code:**

```
#include<iostream.h>
void swapping(int &a, int &b)
{
	int temp;
	temp = a;
	a = b;
	b = temp;
}
void display(int *array, int size) {
	for(int i = 0; i<size; i++)
	cout << array[i] << " ";
	cout << endl;
}
void insertionSort(int *array, int size)
{
	int key, i, j;
	for (j=1; j<size; j++)
	{
		key = array[j];
		i = j-1;
		while(i >=0 && array[i]>key)
		{
			array[i+1] = array[i];
			i--;
		}
		array[i+1] = key;
		cout<<"\nAfter "<<j<<" pass: ";
		display(array , size);
	}
}
```

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```
void selectionSort(int *array, int size)
{
	int i,j, small;
	for(i = 0; i<size-1; i++)
	{
		small = i;
		for(j = i+1; j<size; j++)
		if(array[j] < array[small])
		small = j;
		swapping(array[i], array[small]);
		cout<<"\nAfter "<<i+1<<" pass: ";
		display(array , size);
	}
}
int main()
{
	int n,ch;
	cout << "Enter the number of elements: ";
	cin >> n;
	int arr[1000];
	cout << "Enter elements:" << endl;
	for(int i = 0; i<n; i++)
	{
		cin >> arr[i];
	}
	start:
	cout<<"\n\tMENU\n1.INSERTION SORT\n2.SELECTION SORT\n\nEnter your choice:";
	cin>>ch;
	switch(ch)
	{
		case 1:
		cout << "\nArray before Sorting: ";
		display(arr, n);
		insertionSort(arr,n);
		cout << "\nArray after Sorting: ";
		display(arr, n);
		break;
		case 2:
		cout << "\nArray before Sorting: ";
		display(arr, n);
		selectionSort(arr,n);
```

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```
            cout << "\nArray after Sorting: ";
            display(arr, n);
            break;
            default: cout<<"Invalid choice";
            goto start;
        }
}
```

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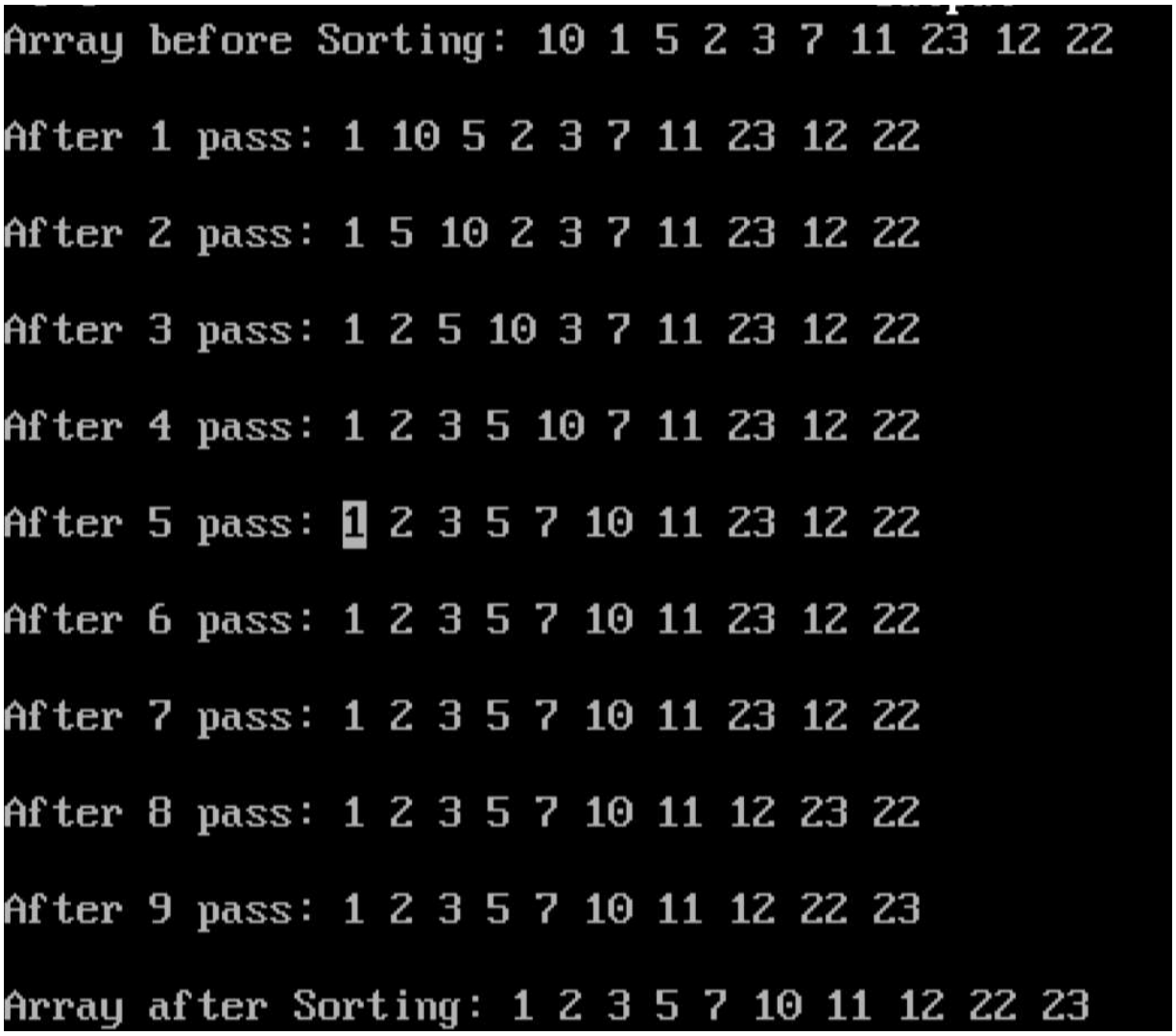
**Output:**

1. Insertion Sort



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2. Selection Sort