Data Structure Lab

CEN-391

Bubble Sort

Code :-

```
#include <iostream>
using namespace std;
#define size 1000

void Swap(int arr[], int i, int j)
{
    int temp = arr[i];
    arr[i] = arr[j];
    arr[j] = temp;
}

void PrintArray(int arr[], int n)
{
    for (int i = 0; i < n; i++)
        cout << arr[i] << " ";
    cout << endl;
}
```

```
void Bubble_Sort(int arr[], int n)
{
        cout << endl
         << "Given Array -> ";
    PrintArray(arr, n);
    for (int i = 1; i < n; i++)
    {
        cout << endl
             << "Pass -> " << i << endl<<endl;
        for (int j = 1; j < n + 1 - i; j++)
        {
            cout<< "Iteration No -> " << j << endl;
            if (arr[j - 1] > arr[j])
                Swap(arr, j, j - 1);
                PrintArray(arr, n);
        }
    }
}

int main()
{
    system("cls");
    cout<<"_____20BCS070 Vicky Gupta_____"<<endl;
    cout<<"__________Bubble Sort__________"<<endl<<endl;
    int n, arr[size];

    cout << "Enter The Size Of The Array : ";
    cin >> n;

    cout << "Enter The Elements Of The Array : ";
    for (int i = 0; i < n; i++)
        cin >> arr[i];

    Bubble_Sort(arr, n);

    cout << endl
         << "Sorted Array -> ";

    PrintArray(arr, n);
    cout<<endl;
    return 0;
}
```

Output :-

```
______20BCS070 Vicky Gupta_____
__________Bubble Sort__________

Enter The Size Of The Array : 5
Enter The Elements Of The Array : 5 4 3 2 1

Given Array -> 5 4 3 2 1

Pass -> 1

Iteration No -> 1
4 5 3 2 1
Iteration No -> 2
4 3 5 2 1
Iteration No -> 3
4 3 2 5 1
Iteration No -> 4
4 3 2 1 5

Pass -> 2

Iteration No -> 1
3 4 2 1 5
Iteration No -> 2
3 2 4 1 5
Iteration No -> 3
3 2 1 4 5

Pass -> 3

Iteration No -> 1
2 3 1 4 5
Iteration No -> 2
2 1 3 4 5

Pass -> 4

Iteration No -> 1
1 2 3 4 5

Sorted Array -> 1 2 3 4 5
```

Data Structure Lab

CEN-391

Early Termination Bubble Sort

Code :-

```
#include <iostream>
using namespace std;
#define size 1000

void Swap(int arr[], int i, int j)
{
    int temp = arr[i];
    arr[i] = arr[j];
    arr[j] = temp;
}

void PrintArray(int arr[], int n)
{
    for (int i = 0; i < n; i++)
        cout << arr[i] << " ";
    cout << endl;
}

void Bubble_Sort(int arr[], int n)
```

```
{
    cout << endl
         << "Given Array -> ";
    PrintArray(arr, n);
    for (int i = 1; i < n; i++)
    {
        bool chk = true;
        cout << endl
             << "Pass -> " << i << endl
             << endl;
        for (int j = 1; j < n + 1 - i; j++)
        {
            cout << "Iteration No -> " << j << endl;
            if (arr[j - 1] > arr[j])
            {
                Swap(arr, j, j - 1);
                chk = false;
            }
            PrintArray(arr, n);
        }
        if (chk)
            break;
    }
}

int main()
{
    system("cls");
    cout<<"________20BCS070 Vicky Gupta_______"<<endl;
    cout << "______Termination Bubble Sort_____" << endl
         << endl;
    int n, arr[size];

    cout << "Enter The Size Of The Array : ";
    cin >> n;

    cout << "Enter The Elements Of The Array : ";
    for (int i = 0; i < n; i++)
        cin >> arr[i];

    Bubble_Sort(arr, n);

    cout << endl
         << "Sorted Array -> ";
```

```
    PrintArray(arr, n);
    cout << endl;
    return 0;
}
```

Output :-

```
________20BCS070 Vicky Gupta_______
______Termination Bubble Sort______

Enter The Size Of The Array : 5
Enter The Elements Of The Array : 5 4 1 2 3

Given Array -> 5 4 1 2 3

Pass -> 1

Iteration No -> 1
4 5 1 2 3
Iteration No -> 2
4 1 5 2 3
Iteration No -> 3
4 1 2 5 3
Iteration No -> 4
4 1 2 3 5

Pass -> 2

Iteration No -> 1
1 4 2 3 5
Iteration No -> 2
1 2 4 3 5
Iteration No -> 3
1 2 3 4 5

Pass -> 3

Iteration No -> 1
1 2 3 4 5
Iteration No -> 2
1 2 3 4 5

Sorted Array -> 1 2 3 4 5
```