

Implementation and Analysis of Bubble Sort

```
def bubble_sort(a):
    n = len(a)
    for i in range(n - 1):
        for j in range(n - i - 1):
            if a[j] > a[j + 1]:
                a[j], a[j + 1] = a[j + 1], a[j]
    return a

def display(a):
    for i in range(len(a)):
        print(a[i], end=' ')

print("Enter an array")
a = list(map(int, input().split()))
bubble_sort(a)
print("Sorted Array: ")
display(a)
```

Input:

20 30 50 10 40

Output:

10 20 30 40 50

Time Complexity:

- $O(n^2)$

Program:

```
Bubble Sort.py x
1 def bubble_sort(a):
2     n = len(a)
3     for i in range(n - 1):
4         for j in range(n - i - 1):
5             if a[j] > a[j + 1]:
6                 a[j], a[j + 1] = a[j + 1], a[j]
7     return a
8
9
10 def display(a):
11     for i in range(len(a)):
12         print(a[i], end=' ')
13
14
15 print("Enter an array")
16 a = list(map(int, input().split()))
17 bubble_sort(a)
18 print("Sorted Array: ")
19 display(a)
20
```

bubble_sort() for i in range(n - 1) for j in range(n - i - 1) if a[j] > a[j + 1]

Input/Output:

```
Bubble Sort
C:\Anaconda\envs\MLProject\python.exe "C:\MLProject\Bubble Sort.py"
Enter an array
20 30 10 50 40
Sorted Array:
10 20 30 40 50
Process finished with exit code 0
```

Run Terminal Python Console Event Log