**รหัสนิสิต 61364392**

* **Insertion sort**

[(sorted), unsorted]

**1st step**

[(6),**1**,3,6,4,3,9,2] -> [(**1**,6),3,6,4,3,9,2]

**2nd step**

[(1,6),**3**,6,4,3,9,2] -> [(1,6,**3**),6,4,3,9,2]

[(1,6,**3**),6,4,3,9,2] -> [(1,**3**,6),6,4,3,9,2]

**3rd step**

[(1,3,6),**6**,4,3,9,2] -> [(1,3,6,**6**),4,3,9,2]

**4th step**

[(1,3,6,6),**4**,3,9,2] -> [(1,3,6,6,**4**),3,9,2]

[(1,3,6,6,**4**),3,9,2] -> [(1,3,6,**4**,6),3,9,2]

[(1,3,6,**4**,6),3,9,2] -> [(1,3,**4**,6,6),3,9,2]

**5th step**

[(1,3,4,6,6),**3**,9,2] -> [(1,3,4,6,6,**3**),9,2]

[(1,3,4,6,6,**3**),9,2] -> [(1,3,4,6,**3**,6),9,2]

[(1,3,4,6,**3**,6),9,2] -> [(1,3,4,**3**,6,6),9,2]

[(1,3,4,**3**,6,6),9,2] -> [(1,3,**3**,4,6,6),9,2]

**6th step**

[(1,3,3,4,6,6),**9**,2] -> [(1,3,3,4,6,6,**9**),2]

**7th step**

[(1,3,3,4,6,6,9),**2**] -> [(1,3,3,4,6,6,9,**2**)]

[(1,3,3,4,6,6,9,**2**)] -> [(1,3,3,4,6,6,**2**,9)]

[(1,3,3,4,6,6,**2**,9)] -> [(1,3,3,4,6,**2**,6,9)]

[(1,3,3,4,6,**2**,6,9)] -> [(1,3,3,4,**2**,6,6,9)]

[(1,3,3,4,**2**,6,6,9)] -> [(1,3,3,**2**,4,6,6,9)]

[(1,3,3,**2**,4,6,6,9)] -> [(1,3,**2**,3,4,6,6,9)]

[(1,3,**2**,3,4,6,6,9)] -> [(1,**2**,3,3,4,6,6,9)] **FINAL**

* **Selection sort**

SORTED

1st step [**6**,**1**,3,6,4,3,9,2] -> [**1,6**,3,6,4,3,9,2]

2nd step [1,**6**,3,6,4,3,9,**2**] -> [1,**2**,3,6,4,3,9,**6**]

3rd step [1,2,**3**,6,4,3,9,6] -> [1,2,**3**,6,4,3,9,6]

[1,2,3,**6**,4,**3**,9,6] -> [1,2,3,**3**,4,**6**,9,6]

4th step [1,2,3,3,**4**,6,9,6] -> [1,2,3,3,**4**,6,9,6]

[1,2,3,3,4,**6**,9,6] -> [1,2,3,3,4,**6**,9,6]

[1,2,3,3,4,6,**9**,**6**] -> [1,2,3,3,4,6,**6,9**] **FINAL**

* **Bubble sort**

**1st step**

[6,1,3,6,4,3,**9,2**] -> [6,1,3,6,4,3,2,9]

[6,1,3,6,4,**3,2**,9] -> [6,1,3,6,4,2,3,9]

[6,1,3,6,**4,2**,3,9] -> [6,1,3,6,2,4,3,9]

[6,1,3,**6,2**,4,3,9] -> [6,1,3,2,6,4,3,9]

[6,1,**3,2**,6,4,3,9] -> [6,1,2,3,6,4,3,9]

[6,**1,2**,3,6,4,3,9] -> [6,1,2,3,6,4,3,9]

[**6,1**,2,3,6,4,3,9] -> [***1***,6,2,3,6,4,3,9]

**2nd step**

[1,6,2,3,6,4,**3,9**] -> [1,6,2,3,6,4,3,9]

[1,6,2,3,6,**4,3**,9] -> [1,6,2,3,6,3,4,9]

[1,6,2,3,**6,3**,4,9] -> [1,6,2,3,3,6,4,9]

[1,6,2,**3,3**,6,4,9] -> [1,6,2,3,3,6,4,9]

[1,6,**2,3**,3,6,4,9] -> [1,6,2,3,3,6,4,9]

[1,**6,2**,3,3,6,4,9] -> [***1,2*,**6,3,3,6,4,9]

**3rd step**

[1,2,6,3,3,6,**4,9**] -> [1,2,6,3,3,6,4,9]

[1,2,6,3,3,**6,4**,9] -> [1,2,6,3,3,4,6,9]

[1,2,6,3,**3,4**,6,9] -> [1,2,6,3,3,4,6,9]

[1,2,6,**3,3**,4,6,9] -> [1,2,6,3,3,4,6,9]

[1,2,**6,3**,3,4,6,9] -> [***1,2,3***,6,3,4,6,9]

**4th step**

[1,2,3,6,3,4,**6,9**] -> [1,2,3,6,3,4,6,9]

[1,2,3,6,3,**4,6**,9] -> [1,2,3,6,3,4,6,9]

[1,2,3,6,**3,4**,6,9] -> [1,2,3,6,3,4,6,9]

[1,2,3,**6,3**,4,6,9] -> [***1,2,3,3***,6,4,6,9]

**5th step**

[1,2,3,3,6,4,**6,9**] -> [1,2,3,3,6,4,6,9]

[1,2,3,3,6,**4,6**,9] -> [1,2,3,3,6,4,6,9]

[1,2,3,3,**6,4**,6,9] -> [***1,2,3,3,4*,**6,6,9]

**6th step**

[1,2,3,3,4,6,**6,9**] -> [1,2,3,3,4,6,6,9]

[1,2,3,3,4,**6,6**,9] -> [***1,2,3,3,4,6***,6,9]

**7th step**

[1,2,3,3,4,6,**6,9**] -> [**1,2,3,3,4,6,6,9**] **FINAL**

* **Merge sort**

[6] [1] [3] [6] [4] [3] [9] [2] m = (0+7)/2 = 3

[6] [1] [3] [6] m = (0+3)/2=1 [4] [3] [9] [2] m = (4+7)/2=5

[6] [1] [3] [6] [4] [3] [9] [2]

[6] [1] [3] [6] [4] [3] [9] [2]

[1] [3] [6] [6] [2] [3] [4] [9]

[1] [2] [3] [3] [4] [6] [6] [9] **FINAL**

* **Quick sort**

Pivot ItemFromLeft that is smaller than pivot. ItemFromRight that is larger than pivot.

[6][1][3][6][4][3][9][2]

[1][3][4][3][2] [6] [6][9]

[1][2] [3] [3][4] [6] [9]

[1] [2] [3] [4]

[1][2][3][3][4][6][6][9]