

LAB#20

Example#1: Write a program using selection sort to sort an unsorted array.

```
selectionsort.py > selection_sort
1  from array import array
2
3  def selection_sort(arr):
4      n = len(arr)
5      for i in range(n):
6
7          min_index = i
8
9          for j in range(i + 1, n):
10             if arr[j] < arr[min_index]:
11                 min_index = j
12
13             arr[i], arr[min_index] = arr[min_index], arr[i]
14
15  a1 = array('i', [9, 1, 12, 14, 5])
16  selection_sort(a1)
17
18  for x in a1:
19      print(x, end=' ')
20
21
```

Result:

```
1 5 9 12 14
```

Explanation:

```
def selection_sort([9,1,12,14,5]):  
    n=len([9,1,12,14,5])  
    for i in range(5):          #i=0  
        minindex=0  
        for j in range(i+1,n):  
            if a[1]<a[0]:  
                1<9  
                Minindex=1  
        for j in range(2,5):  
            if a[2]<a[1]  
                12<1  
                X  
        for j in range(3,5):  
            if a[3]<a[1]  
                14<1  
                X
```

```
for j in range(4,5):
```

```
    if a[4]<a[1]
```

```
        5<1
```

```
        X
```

```
    a[0],a[1]=a[1],a[0]
```

```
    a[0],a[1]=1,9
```

updated array:

0	1	2	3	4
1	9	12	14	5

```
for i in range(5):           #i=1
```

```
    minindex=1
```

```
    for j in range(1+1,n)
```

```
        if a[2]<a[1]:
```

```
            12<9
```

```
            X
```

```
    for j in range(3,5):
```

```
        if a[3]<a[1]
```

14<9

X

for j in range(4,5):

if a[4]<a[1]

5<9

True

Minindex=j

Minindex=4

a[1],a[4]=a[4],a[1]

a[1],a[4]=5,9

updated array:

0	1	2	3	4
1	5	12	14	9

for i in range(5): #i=2

minindex=2

for j in range(3,5):

if a[3]<a[2]:

minindex=3

14<12

X

for j in range(4,5):

if a[4]<a[2]:

9<12

Minindex=4

a[2],a[4]=a[4],a[2]

a[2],a[4]=9,12

0	1	2	3	4
1	5	9	14	12

for i in range(5): #i=3

minindex=3

for j in range(4,5):

if a[4]<a[3]:

12<14

Minindex=4

a[3],a[4]=a[4],a[3]

a[3],a[4]=12,14

updated array:

0	1	2	3	4
1	5	9	12	14

for i in range(5): #i=4

 minindex=4

 a[4],a[4]=a[4],a[4]

 a[4],a[4]=14,14

Class Assignment

Q: Write a program that takes an unsorted array from the user and then sorts it by using selection sort. Explain each line of code in detail when you execute it.