Name:Deore Kirti Girish

Roll No.:48

Assignment No.: 05(5.1)

Assignment Title: Develop programs for data structure algorithms using python – searching, sorting and hash tables.(Sorting)

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Code:

**5.1 Sorting in Python:**

**5.1.1 Bubble Sort:**

# Python3 program for Bubble Sort Algorithm Implementation  
def bubbleSort(arr):  
 n = len(arr)  
  
 # For loop to traverse through all  
 # element in an array  
 for i in range(n):  
 for j in range(0, n - i - 1):  
  
 # Range of the array is from 0 to n-i-1  
 # Swap the elements if the element found  
 # is greater than the adjacent element  
 if arr[j] > arr[j + 1]:  
 arr[j], arr[j + 1] = arr[j + 1], arr[j]  
  
  
# Driver code  
# Example to test the above code  
arr = [2, 1, 100, 23, 25, 50]  
  
bubbleSort(arr)  
  
print("Sorted array is:")  
for i in range(len(arr)):  
 print("%d" % arr[i])

**Output:**

Sorted array is:

1

2

23

25

50

100

**5.1.2 Selection Sort:**   
def selectionSort(array, size):  
 for step in range(size):  
 min\_idx = step  
  
 for i in range(step + 1, size):  
 if array[i] < array[min\_idx]:  
 min\_idx = i  
 (array[step], array[min\_idx]) = (array[min\_idx], array[step])  
  
  
# Initializing list1  
list1 = []  
n = int(input("Enter size: "))  
for i in range(0, n):  
 print("Enter Element: ")  
 ele = int(input())  
 # adding the element  
 list1.append(ele)  
  
# Function Call  
selectionSort(list1, n)  
print('Sorted Array in Ascending Order:')  
print(list1)

**Output:**

Enter size: 5

Enter Element:

12

Enter Element:

10

Enter Element:

9

Enter Element:

45

Enter Element:

23

Sorted Array in Ascending Order:

[9, 10, 12, 23, 45]

**5.1.2 Insertion Sort:**

def insertionSort(array):  
 for step in range(1, len(array)):  
 key = array[step]  
 j = step - 1  
  
 while j >= 0 and key < array[j]:  
 array[j + 1] = array[j]  
 j = j - 1  
  
 array[j + 1] = key  
  
# Initializing list1  
list1 = []  
n = int(input("Enter size: "))  
for i in range(0, n):  
 print("Enter Element: ")  
 ele = int(input())  
 # adding the element  
 list1.append(ele)  
  
# Function call  
insertionSort(list1)  
print('Sorted Array in Ascending Order:')  
print(list1)

**Output:**

Enter size: 6

Enter Element:

12

Enter Element:

34

Enter Element:

52

Enter Element:

10

Enter Element:

9

Enter Element:

11

Sorted Array in Ascending Order:

[9, 10, 11, 12, 34, 52]