DSL Practical 4

Mayur Zope Comp A
75

- Write a Python program to store second year percentage of students in array. Write function for sorting array of floating point numbers in ascending order using :
- a) Insertion sort.
- b) Shell Sort and display top five scores.

```
def selection_sort (arr):
    """ Sorts an array of floating point numbers in asending order using Selection Sort. """
    n = len (arr)
    for i in range (n):
        #Find the Minimum element in remaning unsorted array
        min_idx = i
        for j in range (i+1,n):
            if arr[j] < arr[min_idx]:
                min_idx = j
        #swap the found minimum element with the first element
        arr[i], arr[min_idx] = arr [min_idx], arr[i]
    return arr


def bubble_sort (arr):
    """ SORTS AN ARRAY  of floating point numbers in ASending order using bubble sort. """
    n = len(arr)
    for i in range (n):
        for j in range(0,n-i-1):
            if arr[j] > arr[j+1]:
        # swap if the element found is greater than the next element.
                arr[j], arr[j+1]  =  arr[j+1], arr[j]
    return arr
```

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```
def display_top_five_scores(arr):
    """Display the top five scores from the sorted array."""
    #Ensure the array has at least five elements
    top_five = arr[-5:]if len(arr)>=5 else arr
    print ("Top five scores.")

    for score in top_five:
        print(f"{score:.2f}")

def main():
    #Example intput array of percentages (floating point numbers)
    percentages = [6.99, 8.55, 7.44, 9.91, 9.32, 10.00, 8.04, 4.6, 5.5]

    print ("Original percentages:")
    print (percentages)

    #Sorting and displaying top five scores usig Selection Sort
    sorted_percentages_selection = selection_sort(percentages.copy())
    print("\n Sorted percentages (Selection Sort):")
    print(sorted_percentages_selection)
    display_top_five_scores(sorted_percentages_selection)

    #Sorting and displaying top five scores using Bubble Sort
    sorted_percentages_bubble = bubble_sort(percentages.copy())
    print("\n Sorted percentages (Bubble Sort):")
    print(sorted_percentages_bubble)
    display_top_five_scores(sorted_percentages_bubble)

if __name__=="__main__":
    main()
```

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// OUTPUT

```
Original percentages:
[6.99, 8.55, 7.44, 9.91, 9.32, 10.0, 8.04, 4.6, 5.5]

 Sorted percentages (Selection Sort):
[5.5, 4.6, 6.99, 7.44, 8.04, 8.55, 9.32, 9.91, 10.0]
Top five scores.
8.04
8.55
9.32
9.91
10.00

 Sorted percentages (Bubble Sort):
[4.6, 5.5, 6.99, 7.44, 8.04, 8.55, 9.32, 9.91, 10.0]
Top five scores.
8.04
8.55
9.32
9.91
10.00

=== Code Execution Successful ===
```