



# SUPERIOR UNIVERSITY

## *Data Structure and Algorithm (Lab)*

### *Assignment – 5*

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## Question # 1:

### Sorting Student Scores:

A teacher has a list of student names along with their test scores. You need to sort the students based on their scores in descending order. If two students have the same score, maintain their original order (i.e., use a stable sort).

### Code:

```
def task1():
    students=[
        ("Ali",92),
        ("Reshail",86),
        ("Sufiyan",75),
        ("Azan",63),
        ("Abdul Ahad",78),
        ("Rafay",89),
        ("Ahmad",75)
    ]
    def sorting(students):
        print(f"Before Sort: {students}.")
        for i in range(len(students)-1):
            for j in range(len(students)-1-i):
                if students[j][1]<students[j+1][1]:
                    students[j],students[j+1]=students[j+1],students[j]
        sorting(students)
        print(f"After Sort: {students}.")
    task1()
```

### Output:

```
E:\Uni\3rd Semester\4) Data Structures & Algorithms (Lab)\Assignments\Assignment 5>python task.py
Before Sort: [('Ali', 92), ('Reshail', 86), ('Sufiyan', 75), ('Azan', 63), ('Abdul Ahad', 78), ('Rafay', 89), ('Ahmad', 75)].
After Sort: [('Ali', 92), ('Rafay', 89), ('Reshail', 86), ('Abdul Ahad', 78), ('Sufiyan', 75), ('Ahmad', 75), ('Azan', 63)].
```

## Question # 2:

### Custom Sort for Words:

Given a list of words, you need to sort them based on the length of each word in ascending order. If two words have the same length, sort them alphabetically.

### Code:

```
def task2():  
    words = ["apple", "banana", "kiwi", "grape", "cherry", "pear", "blueberry"]  
    def sorting(words):  
        print(f"Before Sort: {words}.")  
        for i in range(len(words)-1):  
            for j in range(len(words)-i-1):  
                if len(words[j])>len(words[j+1]):  
                    words[j],words[j+1]=words[j+1],words[j]  
                elif len(words[j])==len(words[j+1]):  
                    if words[j]>words[j+1]:  
                        words[j],words[j+1]=words[j+1],words[j]  
            sorting(words)  
        print(f"After Sort: {words}.")  
    task2()
```

### Output:

```
E:\Uni\3rd Semester\4) Data Structures & Algorithms (Lab)\Assignments\Assignment 5>python task.py  
Before Sort: ['apple', 'banana', 'kiwi', 'grape', 'cherry', 'pear', 'blueberry'].  
After Sort: ['kiwi', 'pear', 'apple', 'grape', 'banana', 'cherry', 'blueberry'].
```