

## ME1 Computing- Session 5: Tuples and Sorting Algorithm

### Learning outcomes:

- Being able to define tuples
- Being able to manage list of tuples
- Being able to sort a sequence of data

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### Before you start

In your H drive create a folder `H:\ME1MCP\Session5` and work within it.

### Task 1: List of tuples

1. Download the files *Names.txt*, *Groups.txt* and *Marks.txt* from Blackboard. Write a script to form a list of tuples, associating every line content of the three files into a tuple.

List  
↓

	Name	Group	Mark
[0]	Cezary	2a	70
[1]	Calum	4c	65
[2]	Gaurav	2a	55
[3]	Carmen	3b	72
[4]	Shidao	3b	70

← Tuple

[0] [1] [2]

### Answer Question 1

### Task B: Sorting algorithm

1. Sort, in descending order by marks, the list of tuples formed in Task A.

	Name	Group	Mark
[0]	Carmen	3b	72
[1]	Cezary	2a	70
[2]	Shidao	3b	70
[3]	Calum	4c	65
[4]	Gaurav	2a	55

[0] [1] [2]

### Answer Question 2

**Task C: Count occurrences**

1. Count the occurrences of every mark and form a list of tuples with (see figure below):
  - a) the numerical mark,
  - b) the number of occurrences of that mark,
  - c) the list of students who achieved that mark.

Plot graphically Occurrences vs Marks.

The diagram shows a list of four tuples. A black arrow labeled 'List' points to the first column of indices [0], [1], [2], [3]. Above the table, 'Integers' is written in blue with a blue arrow pointing to the 'Mark' column, and 'List of strings' is written in blue with a blue arrow pointing to the 'List' column. The table itself has three columns: 'Mark', 'Occ', and 'List'. The data rows are: [0] (72, 1, Carmen), [1] (70, 2, Cezary, Shidao), [2] (65, 1, Calum), and [3] (55, 1, Gaurav). Below the table, the column indices [0], [1], and [2] are aligned under the 'Mark', 'Occ', and 'List' columns respectively. A black arrow labeled 'Tuple' points to the entire row [1].

	Mark	Occ	List
[0]	72	1	Carmen
[1]	70	2	Cezary, Shidao
[2]	65	1	Calum
[3]	55	1	Gaurav

[0] [1] [2]

**Answer Question 3**

**Answer Question 4**