Practice Lab: Data Structures

Fundamentals – III

	Q1	Total
	$5 + 5 + 5 + 8 + 7$	30

Lecture	Topics	Reading
5	**Fundamentals (III)**: Pointers, Incrementing and Decrementing a pointer, Pointer comparison & Array of pointers.	1. Pointers: https://youtu.be/Z3SHmdilVWU
6		2. Incrementing & Decrementing a pointer: https://youtu.be/pr4BEFTOv44
		3. Pointer comparison: https://youtu.be/iflBmCRaJBs
		4. Array of pointers: https://youtu.be/jHj7hfsycOw

Q1) Write a **program** that:

1	Declare a structure named 'student.' Each student should contain a name and marks of three courses, namely, {Math, Chem, Physics}.	5
2	Make an array of pointers, where the size of the array is 10. Each pointer should be able to point to a 'student.'	5
3	Calls out a function, that initializes the names and marks of these 10 students via the user. The function should have, as an argument, 'n' – the size of the array and 'pointer_array' – a pointer to the 1st location of the array of pointers.	5
4	Write a function named 'sort' which accepts (n, pointer_array) and sorts the list as per their names.	8
5	Call out a function named 'print_list' which accepts (n, pointer_array) and prints the sorted list as per their names.	7

Rubrics (Associated Marks)

S. No.	Content	Meets Criteria (1)	Marks	Does not meet expectations (0)	Marks
1	Indentation	Perfect	100%	Code not indented properly	0
2	Code works	Code compiles and executes properly for any variable sized matrices	100%	Code has errors	Based on the code
3	Comments	Code is properly commented	100%	Code is not properly commented.	0

Sample Output:

Herein below you will see a sample view of the program. Items written in black are printed by the program, whereas, items marked in red are inputted by the user. Notice the Unsorted and Sorted print in the list.

> For the following ten students - please input their names and marks in Math, Physics, Chemistry:
>
> Name 1: Zeeshan
> [1.1] Zeeshan – Math: 90
> [1.2] Zeeshan – Chemistry: 85
> [1.3] Zeeshan – Physics: 95
>
> Name 2: Ayesha
> [2.1] Ayesha – Math: 70
> [2.2] Ayesha – Chemistry: 74
> [2.3] Ayesha – Physics: 99
>
> …
>
> Name 10: Umer
> [10.1] Umer – Math: 95
> [10.2] Umer – Chemistry: 55
> [10.3] Umer – Physics: 98
>
> Unsorted Mark Sheet for Spring 2021:
> [1] Zeeshan: Math (90) – Chemistry (85) – Physics (95)
> [2] Ayesha: Math (70) – Chemistry (74) – Physics (99)
> …
> [10] Umer: Math (95) – Chemistry (55) – Physics (98)
>
>
> Sorted Mark Sheet for Spring 2021:
> [1] Ayesha: Math (70) – Chemistry (74) – Physics (99)
> [2] Umer: Math (95) – Chemistry (55) – Physics (98)
> …
> [10] Zeeshan: Math (90) – Chemistry (85) – Physics (95)