

Lab – V: Data Structures

Matrices – I

Q1	Total
10 + 5 + 5 + 10	30

1. This practice lab covers the following **one week** of lectures in the Syllabus. You are expected to watch these videos prior to doing this lab.

Lecture	Topics	Reading
9 10	Dynamic Multidimensional arrays: Two dimensional arrays, two dimensional arrays using pointers, dynamic arrays & two-dimensional dynamic arrays.	<ol style="list-style-type: none"> 1. Two dimensional arrays: https://youtu.be/tVRjl5byrzY 2. Two dimensional arrays using pointers: https://youtu.be/khAU5tGMPTs 3. Dynamic arrays: https://youtu.be/m2FUMo28CSk 4. Two dimensional dynamic arrays: https://youtu.be/34jVHuacTGM 5. Matrix addition: https://youtu.be/YfNxOK7kljQ

Q1) Write a **program** that:

1	A function that initializes $X_{m \times n}$ and $Y_{l \times k}$, where $\{m, n, l, k\}$ are user defined and also its contents.	10
2	A function that evaluates $Z = X + Y$.	5
3	A function that evaluates $Z = X - Y$.	5
4	A function called 'print' that simply prints the answer.	10

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:

Inputs by the user are marked in red.

Dear User. What is your name?

> Aqib

Dear Aqib, please tell me the dimensions of matrix X

> 3

> 2

Dear Aqib, please input the contents of X.

> 3

> 6

> 9

> 0

> 8

> 1

Dear Aqib, Matrix X has the following contents:

[3 6]

[9 0]

[8 1]

Dear Aqib, please tell me the dimensions of matrix Y

> 3

> 2

Dear Aqib, please input the contents of Y.

> 2

> 1

> 0

> 3

> 4

> 1

Dear Aqib, Matrix Y has the following contents:

[2 1]

[0 3]

[4 1]

Dear Aqib, $Z = X + Y$ is shown below:

[5 7]

[9 3]

[12 2]

Dear Aqib, $Z = X - Y$ is shown below:

[1 5]

[9 -3]

[4 0]