

## Lab Exercise

### Task # 1

Implement Jagged arrays from the above pseudocode by taking a size of 5 and resizing it to 10 in each index.

### Task # 2

Create a header file called `matrix_multiply.h` that takes two arrays as input and multiplies them and outputs a multiplied array.

[HINT: Use 2D arrays to accomplish this]

### Task # 3

Write a program that creates a 2D array of 5 x 5 values of type Boolean. Suppose indices represent people and the value at row *i*, column *j* of a 2D array is true just in case *i* and *j* are friends and false otherwise. You can use initializer list to instantiate and initialize your array to represent the following configuration:  
(\* means 'friends')

i/j	0	1	2	3	4
0		*		*	*
1	*		*		*
2		*			
3	*				*
4	*	*		*	

Write a method to check whether two people have a common friend. For example, in the example above, 0 and 4 are both friends with 3 (so they have a common friend), whereas 1 and 2 have no common friends.

#### **Task # 4**

You are tasked with developing a program to manage and display the Grade Point Average (GPA) for the core courses offered in the first semester of four departments: Software Engineering (SE), Artificial Intelligence (AI), Computer Science (CS), and Data Science (DS). Each department offers a distinct number of core courses for this semester: SE has 3 core courses, AI has 4 core courses, CS has 2 core courses, and DS has 1 core course. To efficiently store and present this data, which type of array structure would you employ? implement a solution using the chosen array structure to display the GPAs of the core courses for each department.

#### **Task # 5**

Write a program to manage a seating chart for a conference held in a hall with multiple rows of seats. Each row has a different seat capacity. To efficiently handle the seating arrangements, you decide to use a dynamic array. Implement a C++ code that allocates memory for the seating chart and allows attendees' names to be inputted for each seat. Choose and implement the appropriate type of dynamic array for this scenario.