

## CSCI 2330 – Multidimensional Array Exercises

Consider a 2-dimensional nested array **A** declared as follows:

$$\mathbf{T} \mathbf{A}[\mathbf{R}][\mathbf{C}]$$

where **T** is the type of the array, **A** is the base pointer of the array, **R** is the number of rows, and **C** is the number of columns. Assume the array follows row-major ordering.

1. Give a formula for the number of bytes needed to store **A**.
2. Without using array notation, give a formula for the address of a row vector **A[i]**. Verify by computing **zips[2]** (using the **zips** array from the slides).
3. Without using array notation, give a formula for the address of a single array element **A[i][j]**. Verify by computing **zips[1][3]**.
4. Consider storing a 2D array as a multi-level array (i.e., where each row is allocated independently, as in lab 2) instead of a nested array. What is an advantage of a multi-level array over a nested array? (Hint: think of the structure from lab 2 and why it wouldn't work well using a nested array)
5. What is an advantage of a nested array over a multi-dimensional array? (Hint: think about question 3 in the context of a multi-level array)