Instructions

1. This is an individual assignment. You must do your own work.

2. Show all work. Incomplete solutions will not receive full credit.

Problem 1 (4 Points)

Show the formula necessary to find the address of a num_rows × num_cols 2D array at row i and column j. Assume the array starts at start_addr and that this is a row-major 2D array.

Problem 2 (6 points)

Prove or disprove:

\[ \sum_{i=1}^{n} \frac{1}{2^i} = 1 - \frac{1}{2^n}, \forall n \geq 1 \]  

(1)

Problem 3 (3 points)

List the running time of linked lists in Big-O notation for search, append and prepend. Assume that the linked list does not maintain a “tail” node.