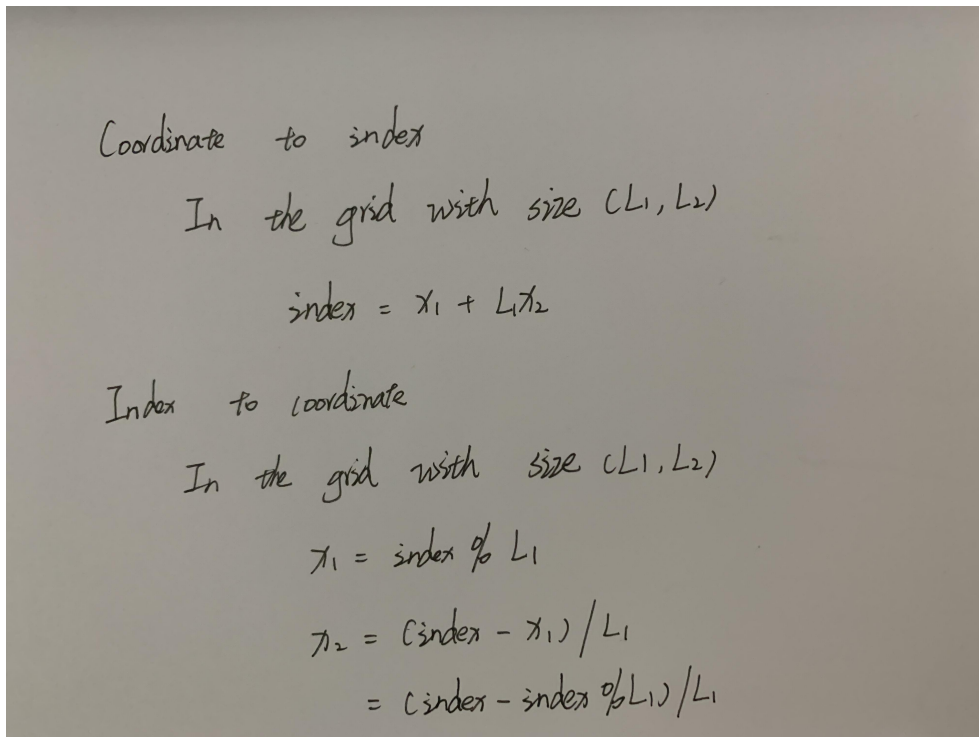


Results:

a) Derive a mathematical equation converting coordinates to index and derive the inverse equations converting index into coordinates in 2-dimensional grid.



Coordinate to index

In the grid with size  $(L_1, L_2)$

$$\text{index} = x_1 + L_1 x_2$$

Index to coordinate

In the grid with size  $(L_1, L_2)$

$$x_1 = \text{index} \% L_1$$
$$x_2 = (\text{index} - x_1) / L_1$$
$$= (\text{index} - \text{index} \% L_1) / L_1$$

b) All the results are in 'output\_index\_7\_1' and 'output\_coordinates\_7\_1'.