COL215 Assignment 1

By Adithya Bijoy and Anish Banerjee

Our Approach

We divided the problem into 3 separate cases for 2, 3 and 4 variable KMaps.
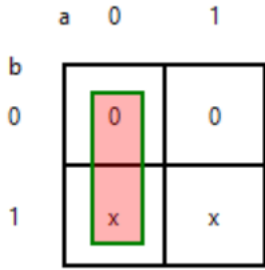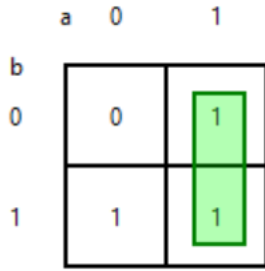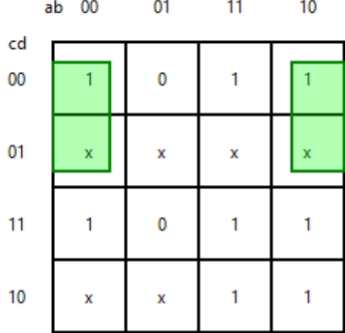
In all the three cases, our first task was to determine the top left and the bottom right coordinates. In the 2 variable case, we found out that the x components (horizontal) depend on the first variable and y components (vertical) depend on the second variable.

In the 3 and 4 variable cases, we figured out that the x components depend only on the first two variables and the y components depend on the third variable in the 3 variable case; and the third and fourth variables in the 4 variable case.

We then traverse through the region to check if there are any '0's. If there are any, we mark the region as not legal (red). Otherwise, it is legal (green).

Test Cases

Note: in the testcases, kmp refers to the KMap

Test Case	Output
kmp = [[0, 0], ['x', 'x']] term = [0, None]	
kmp = [[0, 1], [1, 1]] term = [1, None]	
kmp = [[1,0,1,1], ['x', 'x', 'x', 'x'], [1,0,1,1], ['x', 'x',1,1]] term= [None, 0, 0, None]	

kmp = [[0, 1, 1, 0], ['x', 1, 'x', 0], [1, 0, 0, 0], [1, 'x', 0, 0]] term = [0, None, None, 1]	
kmp = [[1, 1, 1, 'x'], ['x', 1, 'x', 1]] term = [None,0,None]	
kmp = [[0, 1, 1, 0], ['x', 1, 'x', 0]] term = [None,0,None]	
kmp = [[1, 1, 1, 'x'], ['x', 1, 'x', 1],[1, 1, 1, 'x'], ['x', 1, 'x', 1]] term = [None,1,None,0]	
kmp = [[0,1,1,0], ['x',1,'x',0], [1,0,0,0], [1,'x',0,0]] term = [1,0,None,0]	