cmput 304 2023 study questions 8: solution erratum

Question 3b: answer $\alpha = (1/3, 1/3, 1/3, 0, 0, 1)$ is incorrect, for two reasons:

$*$ if we assume that the want the dual of the IP, then it is also an IP, so all variable values must be integer, but they are not.

$*$ the first dual inequality $y_1 + y_2$ is not satified by α.

the primal asks for a set of nodes, such that each edge hits at most one node (an independent set). the dual of this is a set of edges, such that each node is hit by at least one edge (a cover of nodes by edges). so we are looking for a minimum size cover of nodes by edges, for example $\{(a, c), (b, d), (d, e)\} = \{y_2, y_4, y_6\}$. (0, 1, 0, 1, 0, 1) is dual optimal. there are many other dual optimal solutions.