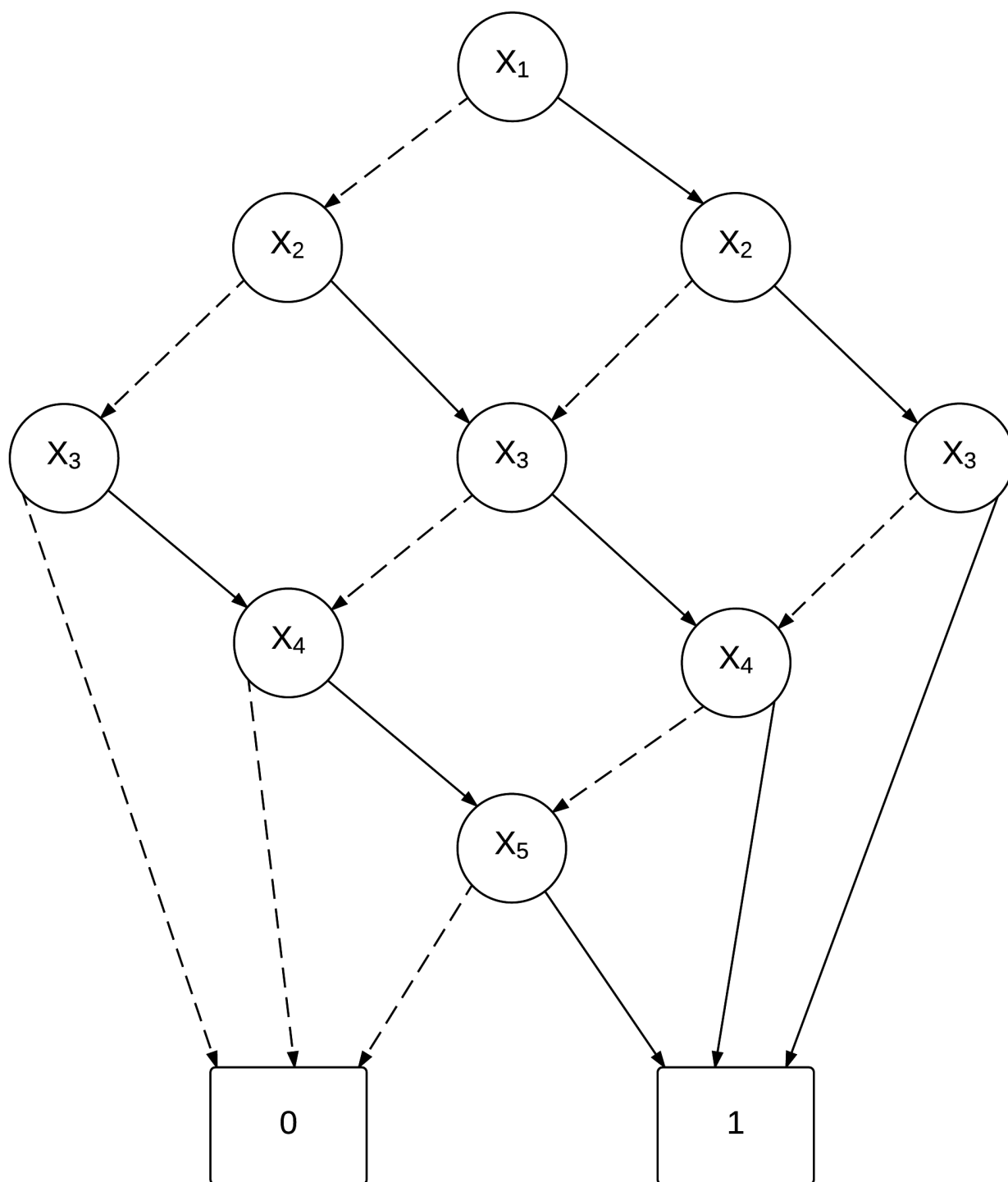


# Mandatory Exercise -

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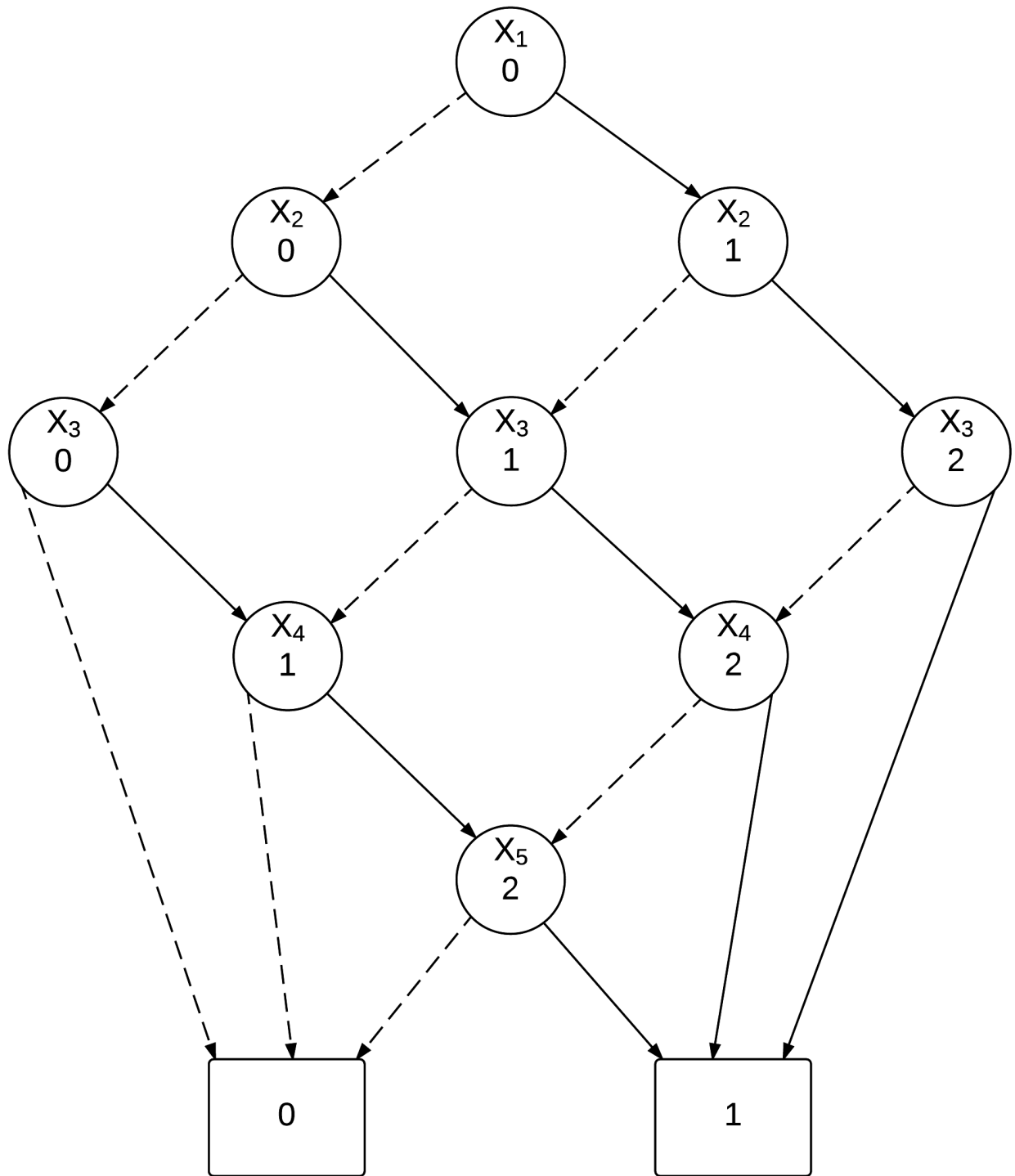
## Task 1

Here is my ROBDD tree of the threshold function with  $k = 3$  and  $n = 5$  with the order of  $x_1, x_2, x_3, x_4, x_5$



## Task 2

Here is the same picture as above but with labels on each node indicating how many truth values have been reached up until this point.



### Task 3

When you reduce the binary tree of a threshold function you make sure that at a given variable only appears 1 time for each state it is able to be in. Since we limit the amount of states to zero to  $(k-1)$  we can say that each variable can only appear  $k$  times. Then we get  $n$  variables a maximum of  $k$  times =  $O(nk)$