COSC326  
Etude 10  
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8 Possible locations for any cube to be yellow or blue. Therefore, we can assume that for any permutation in 8 where they are either A or B, we can look at it in a binary style. IE: 8 bits, of 0 or 1, which therefore implies there are a total of 256 possible permutations from all being 0, to all being 1.

Next, we can look at the formula: 8!/(x1!x2!), where 8! is the permutations and x represents repeated values.   
Thus:   
8!/7!\*1! = 8

8!/6!\*2! = 28

8!/5!\*3! = 56

8!/4!\*4! = 70  
  
Note this is quite reminiscent of pascal’s triangle of n = 8, thus, the next few must be 56, 28 and 8 up to 1.  
  
To visualize in pascal’s triangle:  
1,8,28,56,70,56,28,8,1

Therefore, there are quite a bit of repeated patterns. We can take  
 256-(1 + 8 + 28 + 56 + 70 + 56 + 28 + 8 + 1)   
to find all the possible permutations.

Thus, 256-220 = 36 possible permutations without repetition. Hence, total of 36 possible permutations. Might need to account for all being 1 color, which would simply be removing the front and back of pascal’s triangle to give 38 total combinations.