1. Consider a tree where every node at an even level has $a$ descendants and every node at an odd level has $b$ descendants (where $a$ and $b$ are positive integers). Treat the root node as being at level 0, so that it has $a$ descendants. The tree has $k$ levels total, where $k$ is an even number.
   a. How many nodes are at even level $2n \leq k$?
   b. How many nodes are in the full tree?
   c. What is the runtime of a preorder traversal of the tree? Use big-O notation.

2. Give two different sets of truth values to propositional symbols $P$, $Q$, $R$, and $S$ that make the following sentence in propositional logic be True: $(P \land Q) \Rightarrow (R \land S)$.

3. Imagine you have a bag containing 100 balls of which 20 are red and 80 are green. 90% of the red balls have a stripe and 10% are without a stripe, whereas 70% of the green balls are striped and 30% are without a stripe. If you pull out one ball and it has a stripe what is the probability that it is red?