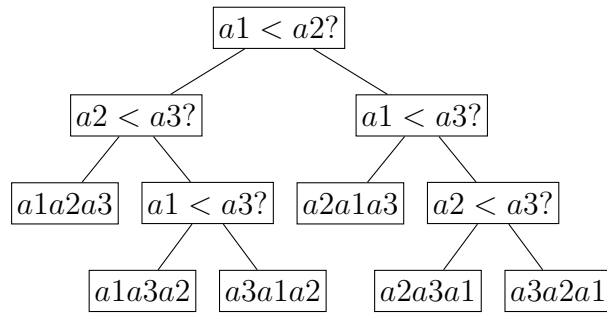


## Decision Tree Worksheet

Complete the decision tree for insertion sort on three elements shown on the board and then answer the questions at the bottom.

In the tree below, the left branch is always true and the right branch is always false.



1. What is the worst-case number of comparisons needed to sort three elements?  
3 comparisons

2. What is the best-case number of comparisons needed to sort three elements?  
2 comparisons

3. What is the average number of comparisons needed to sort three elements assuming that each of the six permutations is equally likely.

$$(2 \times 2 + 4 \times 3)/6 = \frac{16}{6} = 2\frac{2}{3}$$