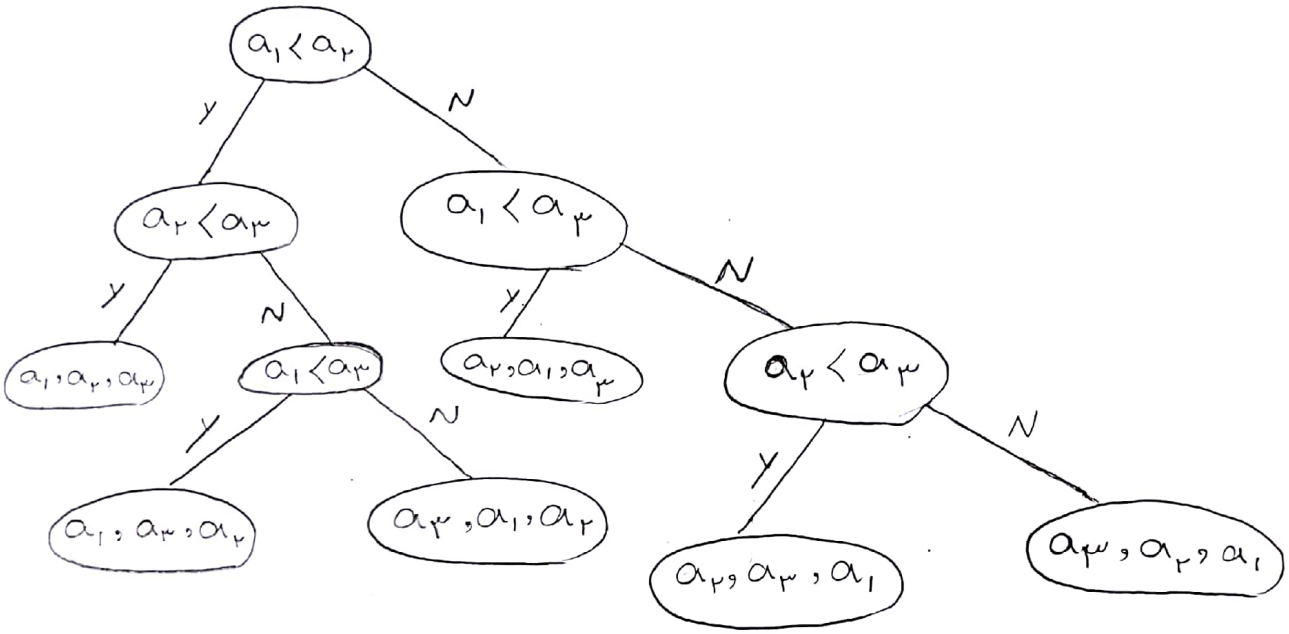
۹۹۳۱۰۷۵ علی نظری

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.

a_1 a_2 a_3



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

   ۳

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

   ۲

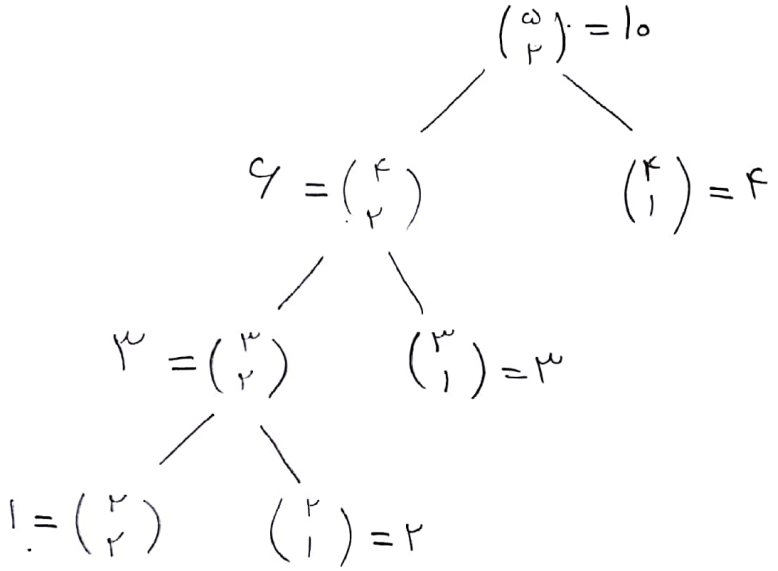
3. What is the average number of comparisons needed to sort three elements assuming that each of the six permutations is equally likely.

   $۲\frac{۲}{۳}$

۹۹۴۱۰۷۵ علی نوری

Binomial Coefficient Worksheet

Draw the recursion tree for computing $\binom{5}{2}$ based on the Pascal recurrence and answer the questions below.



1. Use the tree to determine how many calls would a recursive algorithm make to compute $\binom{5}{2}$.

۱۹ ← ۵ بار فراخوانی
۱۷

2. Can you deduce from this a closed formula to determine the number of calls to compute $\binom{n}{k}$.

۵ بار فراخوانی ← $۲\binom{n}{k} - ۱$