pd1 hw48 2021-12-08 **Ivan Chen**

worked with no one; advised by no one

steps to a recursive solution

test cases and their answers

smallest case
1 student
1 way

next-to-smallest case
2 students
2 ways

larger case(s)
3 students
6 ways

the request that will start the processing
I am asked to calculate the number of ways to uniquely arrange *n* students in a linear line.

base case processing
1 way

decision rule
if n = 1

recursive case processing, in three sub-parts

recursive abstraction
When I am asked to calculate the number of ways to uniquely arrange *n* students in a linear line,
the recursive abstraction can calculate the number of ways to arrange the *n-1* students in a linear line.

the leftover piece

Calculate the number of positions the *n*th student can be in, for every
    arrangement.

all the processing for a recursive case

When I am asked to calculate the number of ways to uniquely arrange *n* students
    in a linear line
and the recursive abstraction has provided the calculations for the number of
    ways to arrange *n-1* students in a linear line,
then the remaining part of processing recursive cases requires multiplying the
    number of positions the *n*th student can be in for each arrangement
by the number of ways to arrange *n-1* students in a linear line.