

CO 430/630 LECTURE 5 SUMMARY

WINTER 2026

SUMMARY

You worked together on a worksheet which outlines a combinatorial proof of LIFT. The first step is in the situation where $\phi(\lambda) = \frac{1}{1-\lambda}$ in which case $A(x) = x\phi(A(x))$ is the generating series of plane rooted trees and the thing on the other side of LIFT (matching up to the number of plane rooted trees of size n) is the number of cycles of n nonnegative integers where the sum of the integers is $n - 1$. That's enough hints for now since you'll keep working on it next class.

NEXT TIME

We'll keep working on the worksheet and I'll bring an optional second worksheet for groups that finish the combinatorial proof of LIFT.

REFERENCES

There's also the algebraic proof of LIFT in the CO 330 notes by David Wagner https://uwaterloo.ca/combinatorics-and-optimization/sites/default/files/uploads/documents/co330-notes_0.pdf