CSC148: EFFICIENCY II & RECURSION

2016-10-24

- INDIVIDUAL STEPS TAKE CONSTANT TIME
- THE RUNTIME IS SIGNIFICANTLY AFFECTED BY THE NUMBER OF ITERATIONS
- DEPENDING ON THE FUNCTION, THERE ARE ALSO SEVERAL TYPES OF INPUT
- THE LOOP STOPS SOMEWHERE → HOW CAN THE EFFICIENCY BE MEASURED?

→ CARE ABOUT OVERALL DEPENDENCY

→ EXAMPLE: $O(\min\{n, m\})$

PROBLEM-SOLVING AS FINDING STRUCTURE

STRUCTURE OF THE PROBLEM AFFECTS THE STRUCTURE OF THE CODE.

IDENTIFYING THE DATA STRUCTURE DETERMINES THE PROGRAMMING PATTERN.

THINK OF LISTS $(\text{OF LISTS})^n$ OF NUMBERS.

A NESTED LIST OF DEPTH 0 IS A NUMBER ✓

A NESTED LIST OF DEPTH 1 IS A LIST OF NUMBERS.

THUS, A NESTED LIST OF DEPTH n IS A LIST OF NESTED LISTS OF DEPTH $n-1$.

HENCE, A FUNCTION CAN BE DEFINED WHICH GOES THROUGH EACH LEVEL OF NESTED LISTS