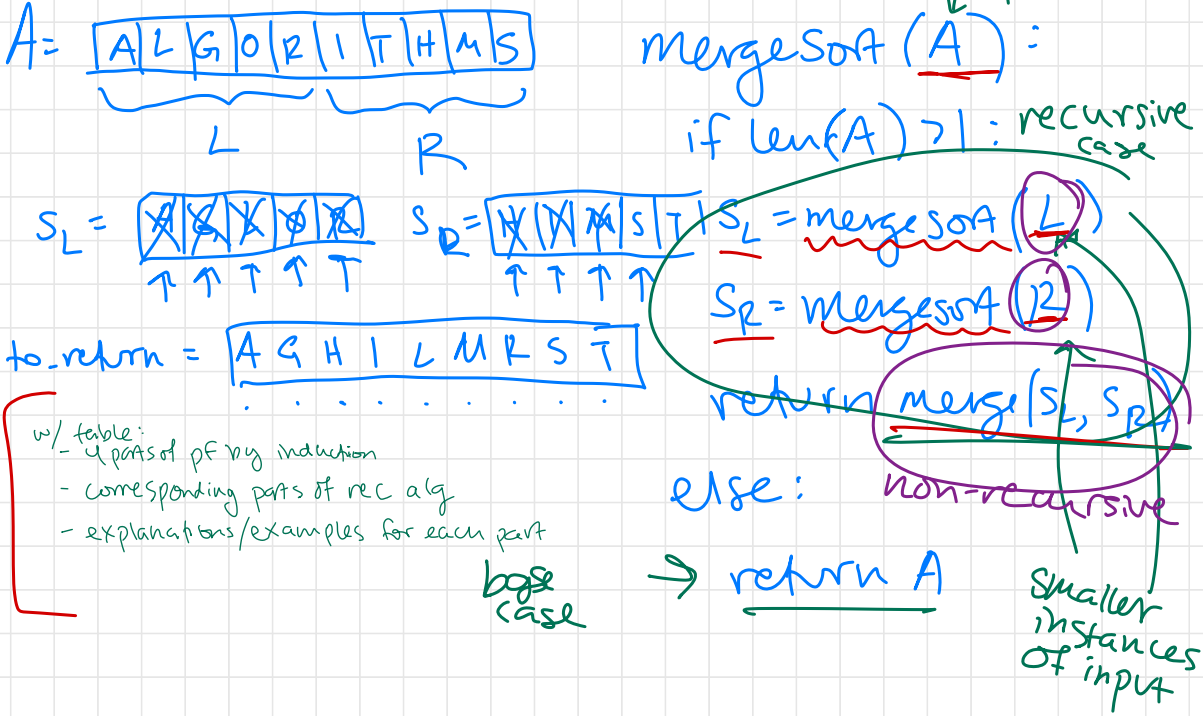
Divide and Conquer

example problem: sorting an array



w/ table:
- 4 parts of pf by induction
- corresponding parts of rec alg
- explanations/examples for each part

Proofs by Induction

0) claim

1) Universal Declaration

"Let x be an arbitrary..."

2) Inductive hypothesis

"Assume property holds for all y smaller than x"

Recursive Algs

arbitrary input

"Recursion fairy"

Assume alg works for all smaller instances

(3) Base case → prove property directly | solve directly

(4) Inductive case → Use the claim on smaller instances to show that claim holds for x | Use the result of calling alg on smaller instances to construct a fully correct output

5) Conclusion

w/ table:
- 4 parts of pf vs induction | function always returns
- corresponding parts of rec alg
- explanations/examples for each part