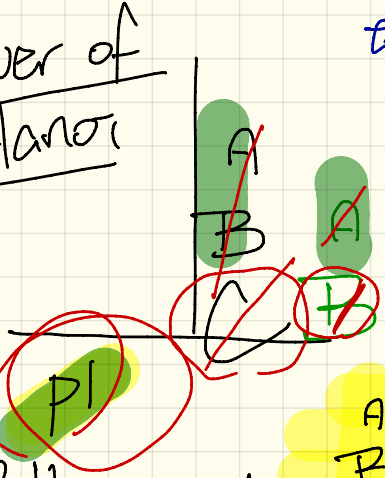
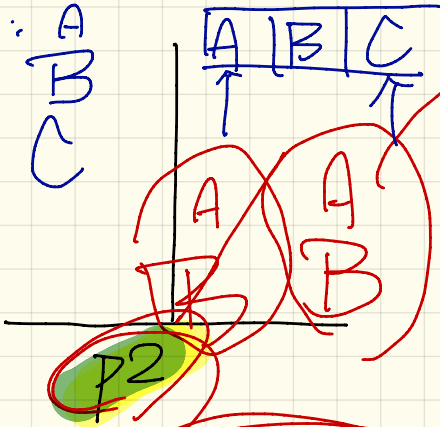
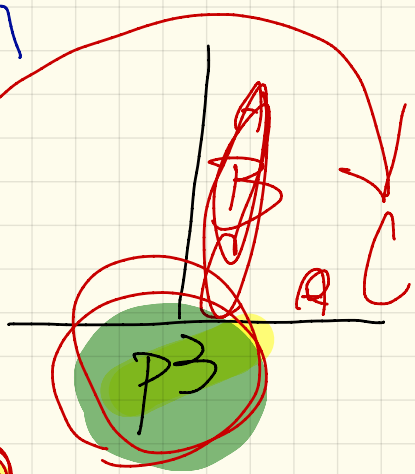
Lecture 19

Tuesday Nov. 14

Tower of Hanoi







Problem: Move A B C from p1 to p3

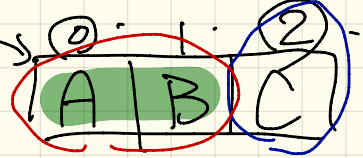
Move A from p1 to p3
Move B from p1 to p2
Move A from p3 to p2

Move A B from p1 to p2

Move C from p1 to p3

Move A B from p2 to p3

Problem: Move A, B, C from p1 to p3



toH(ds, 0, 2, p1, p3) =

{"A", B, C}

intermediate = 6 − 1 − 3

= 2

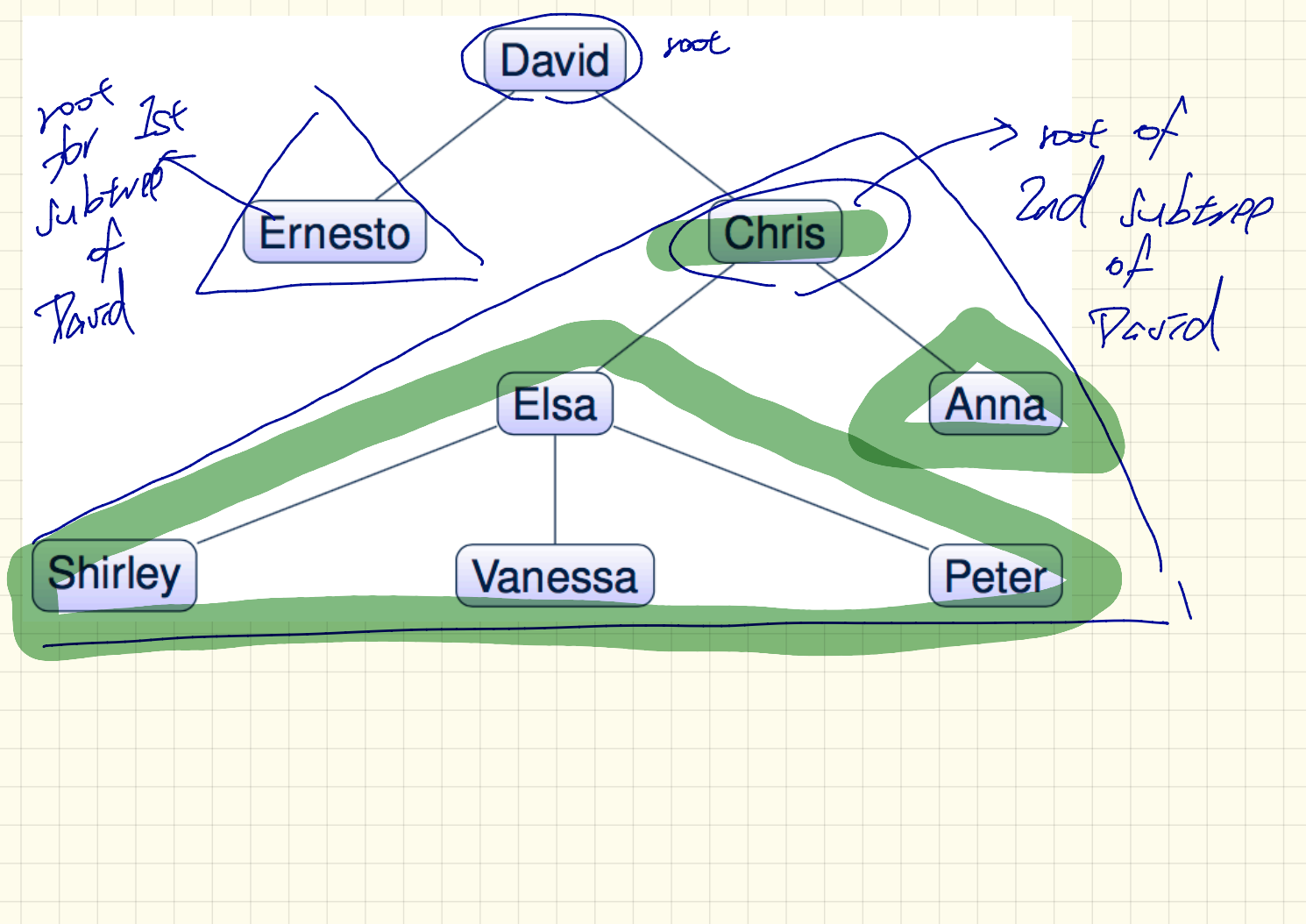
intermediate : p3

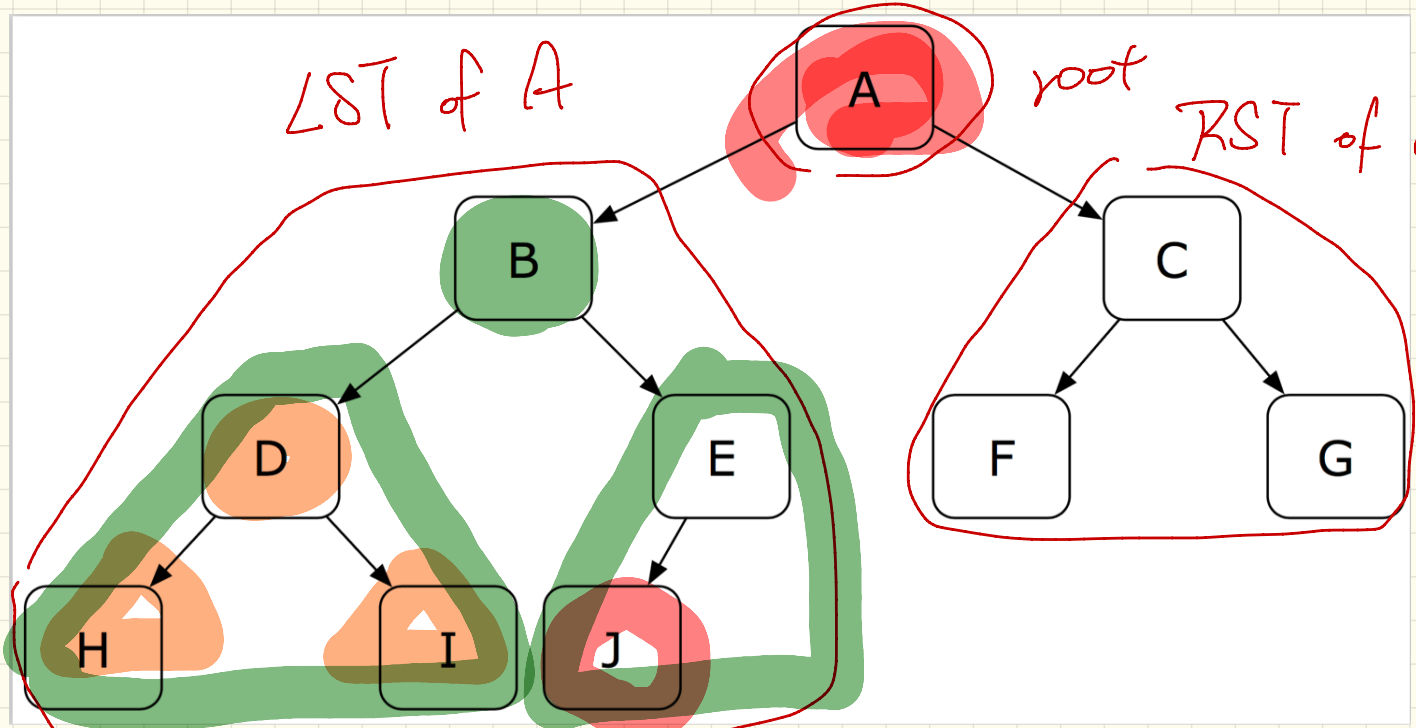
{ toH(ds, 0, 0, p1, p3)
move ds[0] from p1 to p2
toH(ds, 0, 0, p3, p2)

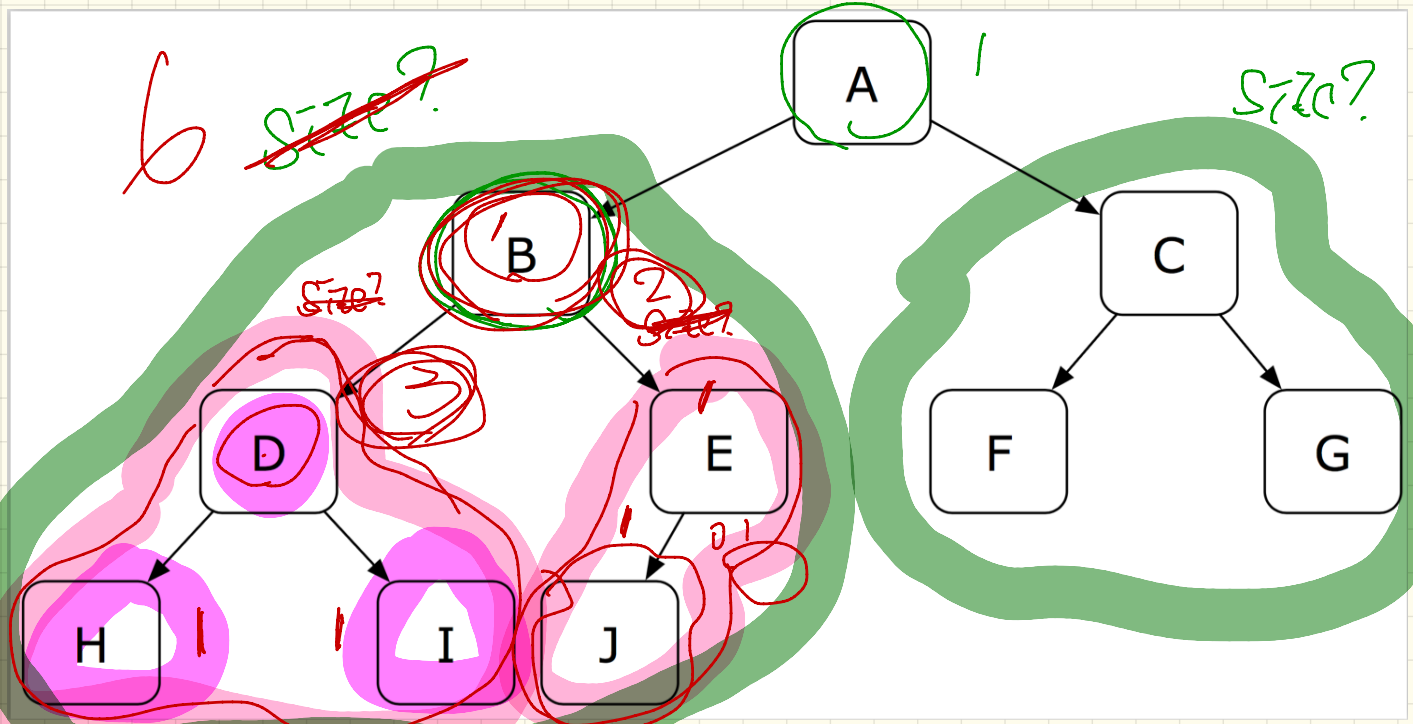
{ toH(ds, 0, 1, p1, intermediate: p2)
{A, B}

Move ds[1] from p1 to p3

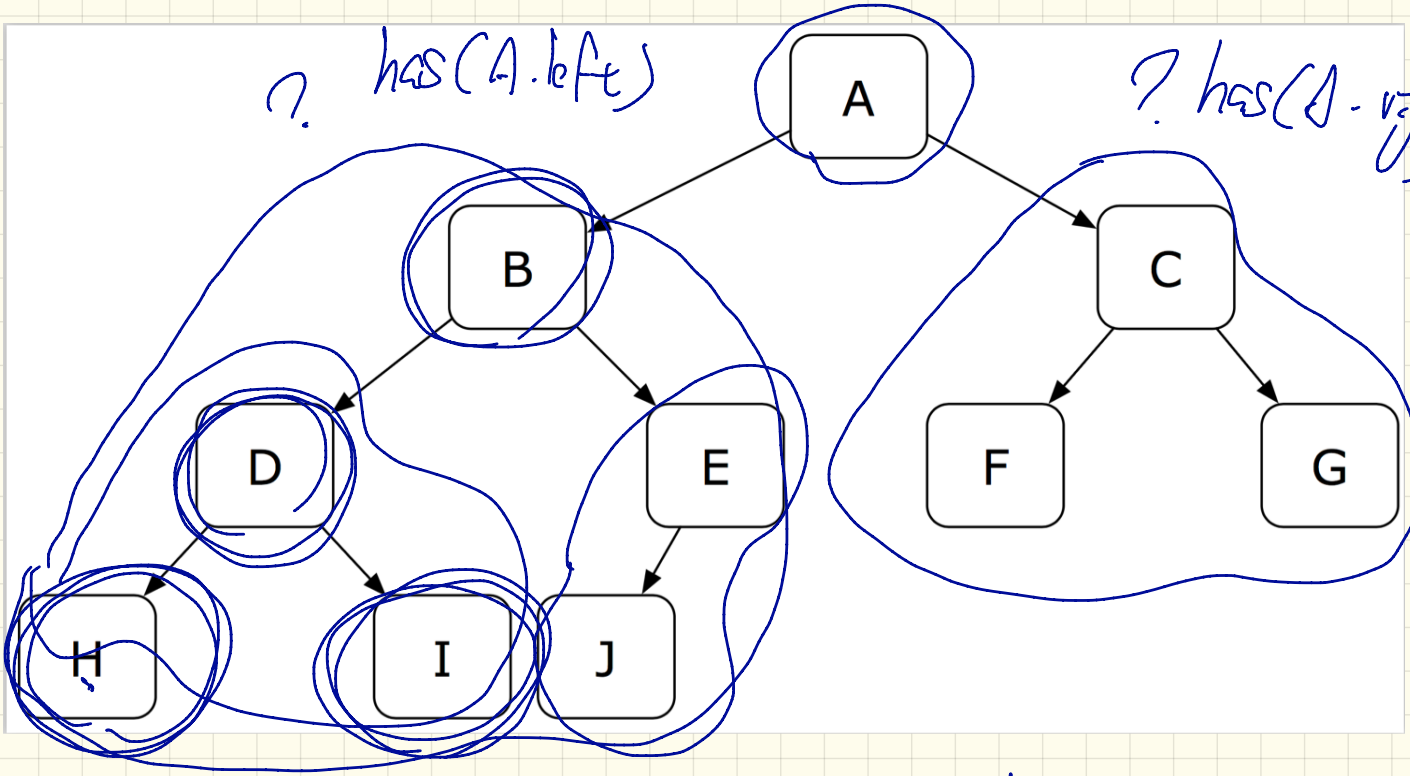
toH(ds, 0, 1, intermediate, p3)
{A, B}


David
root
root for 1st subtree of David
Ernesto
Chris
root of 2nd subtree of David
Elsa
Anna
Shirley
Vanessa
Peter


LST of A
A
root
RST of A
B
C
D
E
F
G
H
I
J



Size of subtree rooted at A

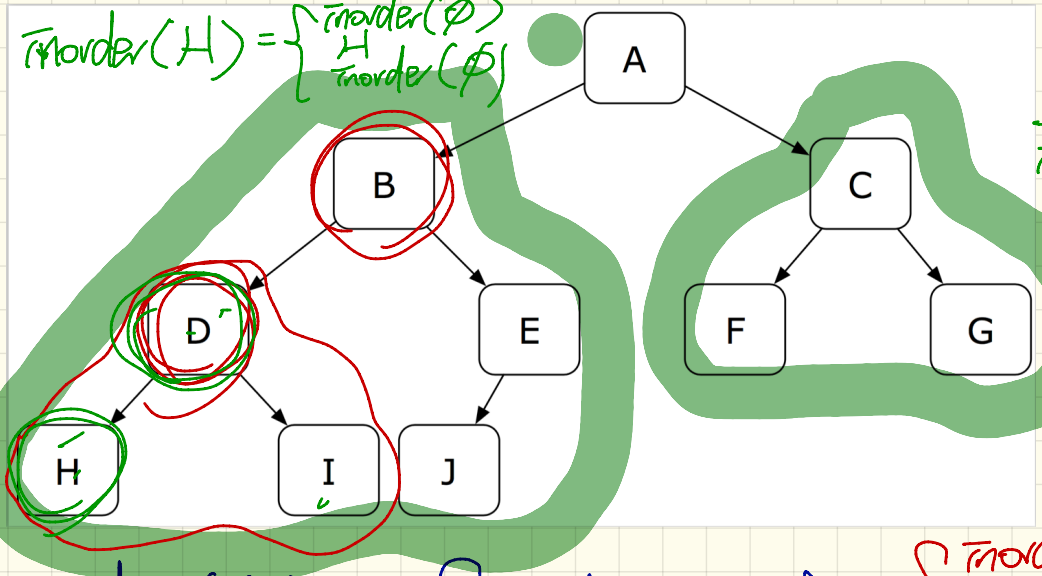


? has(A.left)

? has(A.right)

has(H)

has(A) = A == H ||
has(A.left) ||
has(A.right).



$\overline{inorder}(H) = \{ \overline{inorder}(\emptyset),\ H,\ \overline{inorder}(\emptyset) \}$

H D I B J E

$\overline{inorder}(D)$ $\overline{inorder}(E)$

$\overline{inorder}(A)$

$\overline{inorder}(A) = \{ \overline{inorder}(A.left),\ A,\ \overline{inorder}(A.right) \}$

$\overline{inorder}(A.left) = B$

$\overline{inorder}(B) = \{ \overline{inorder}(B.left),\ B,\ \overline{inorder}(B.right) \}$

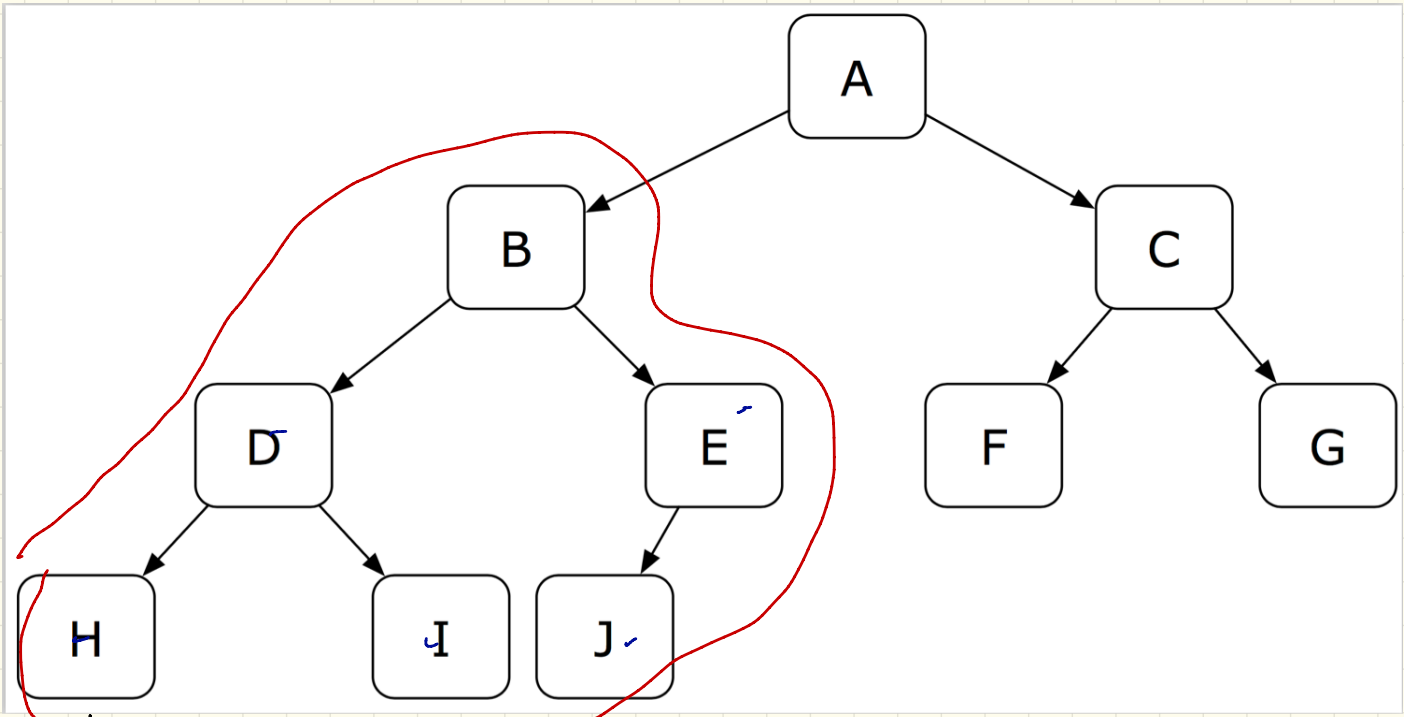
$\overline{inorder}(B.left) = D$

H

$\overline{inorder}(H)$

D

$\overline{inorder}(I)$



Inorder(A)

HDIBJEAFCG

TO(B)

TO(D)

TO(E)

TO(A)

TO(C)