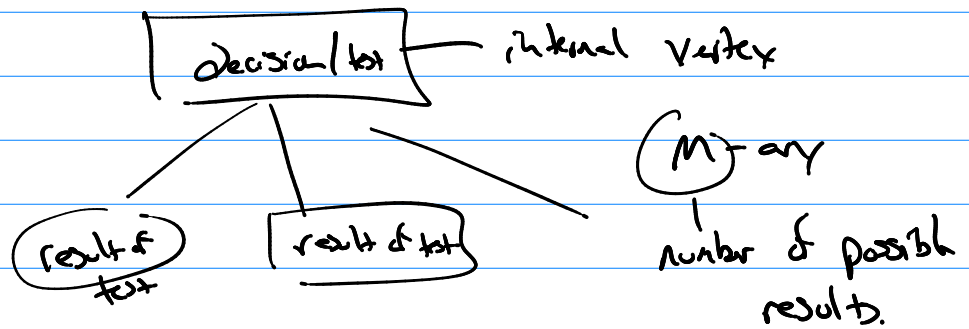
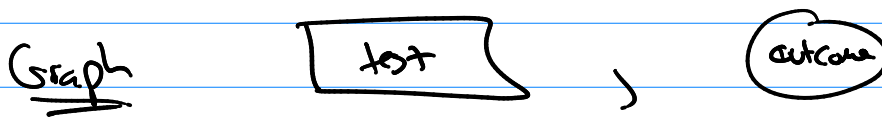


Math 322

Decision Tree ①

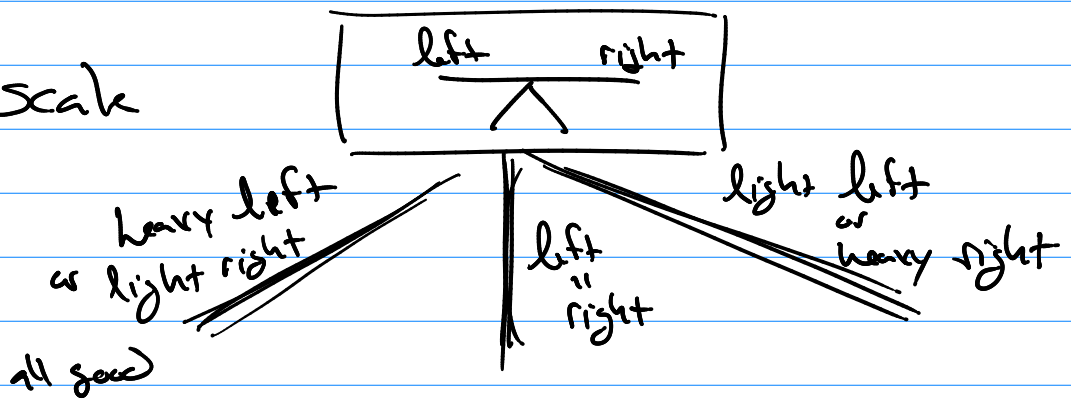


② leaves = all end outcomes.



③ 1 possible fake (light? heavy?) in a set of 5 coins.

test = scale



leaves = (ok), (1 light), (1 heavy), (2L), (2H), ...

$$|\text{leaves}| = 11$$

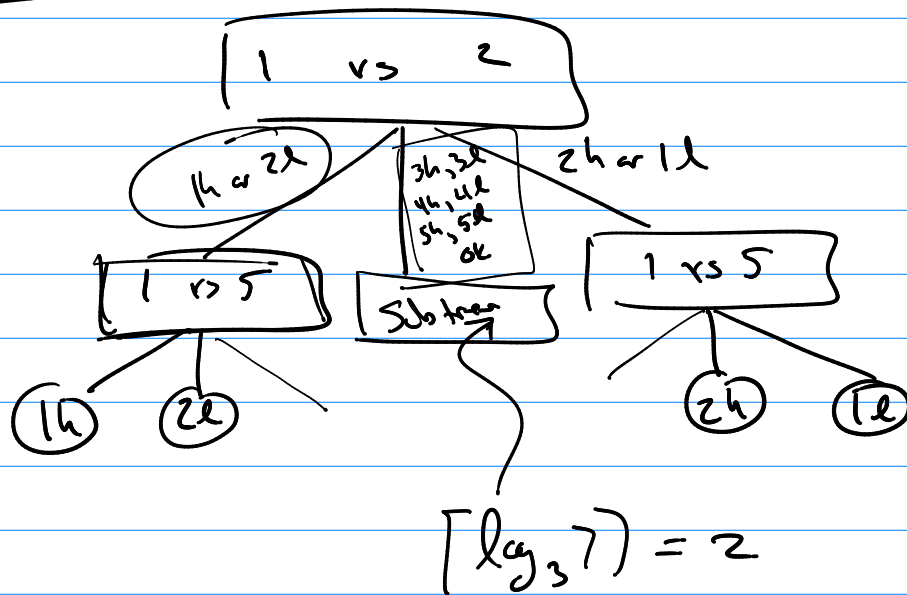
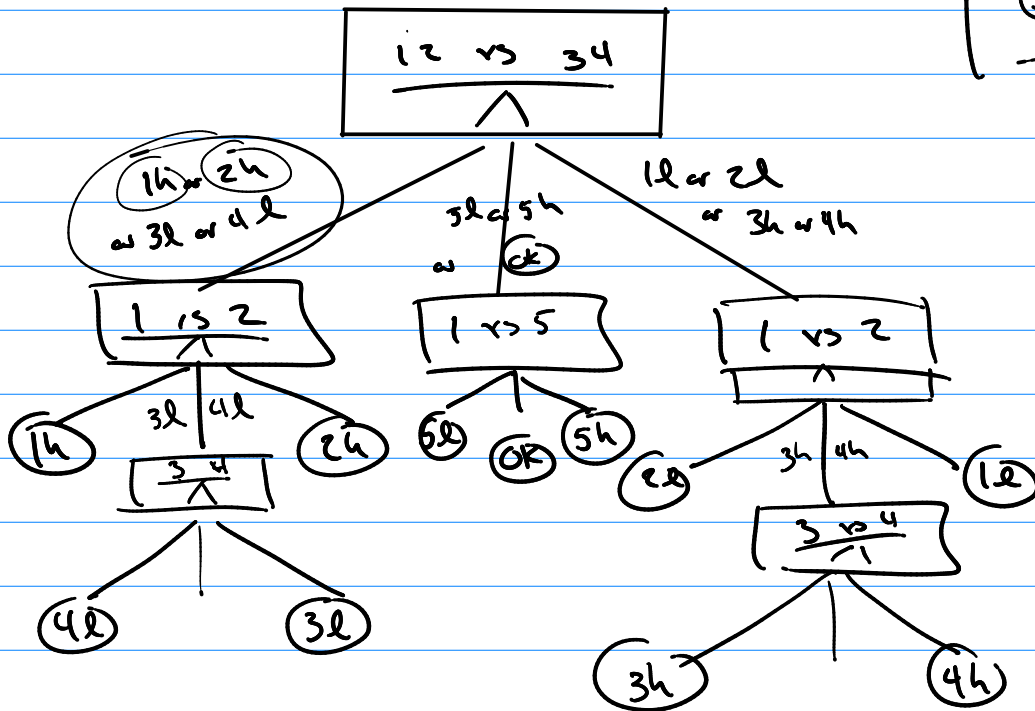
Know $h \geq \lceil \log_3 11 \rceil = \lceil \log_3 11 \rceil = 3$

So using scale only 3 times is the best case version of finding outcome.

Make a tree

Min is coin m, coin n
 m is coin m

OK	1L	1H
2L	2H	3L
3H	4L	4H
5L	5H	



Game tree

Decision tree where we label
vertices by value to player #1.

→ label internal vertices by min/max principle
 (don't be stupid rule)

Nakura

← player #1 sees this

← player #2 sees this

X	O	O
O	X	
X		

+1

player #1 is X

X	O	O
O	X	
X	X	

0

X	O	O
O	X	X
X		

0

X	O	O
O	X	
X		X

+1

X	O	O
O	X	O
X	X	

+1

X	O	O
O	X	O
X	X	O

0

X	O	O
O	X	X
X	O	

+1

X	O	O
O	X	X
X		O

0

X	O	O
O	X	O
X	X	X

+1

X	O	O
O	X	X
X	X	O

0

X	O	O
O	X	X
X	O	X

+1

X	O	O
O	X	X
X	X	O

0

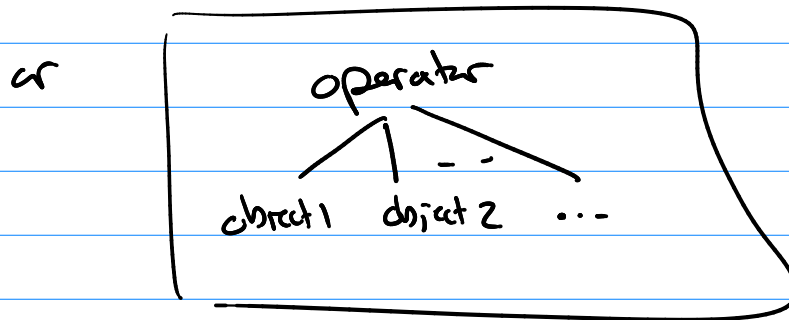
expression trees / tree traversals

Math(5) = (tax + rds)

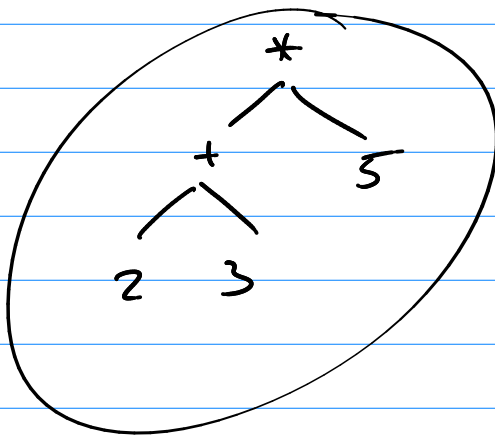
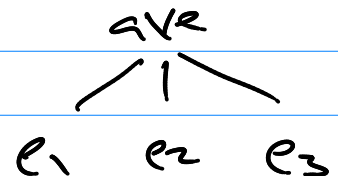
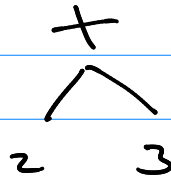
play with trees

ex house modify using red
object operator

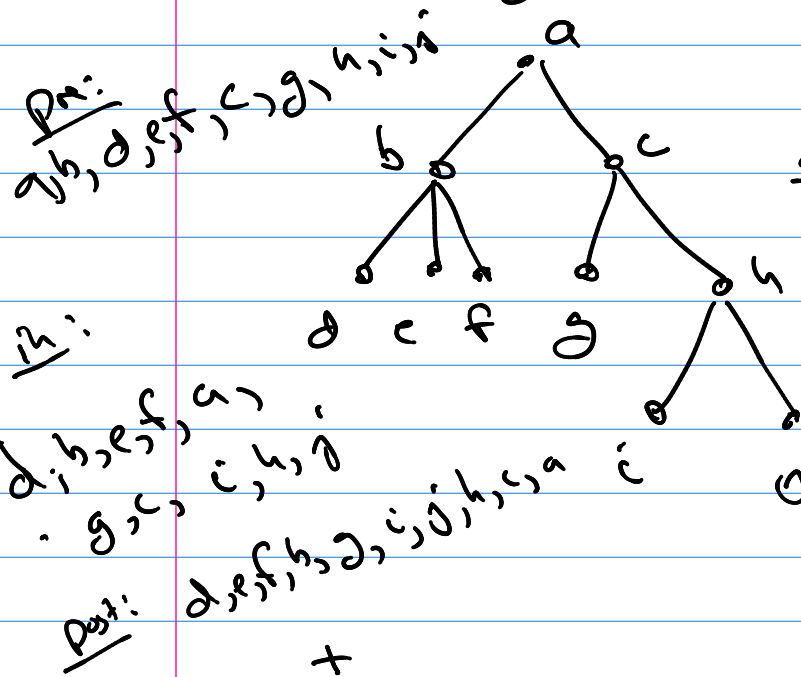
Unary
operator
|
object



Sp in arithmetic



So how to go from tree to linear seq.

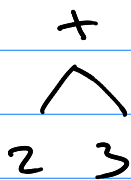


Pre-order traversal
order: root, child 1, child 2, ...

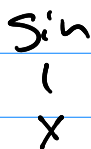
In-order traversal
order: child 1, root, child 2, ...

Post-order traversal

order: child 1, child 2, ..., child n, root



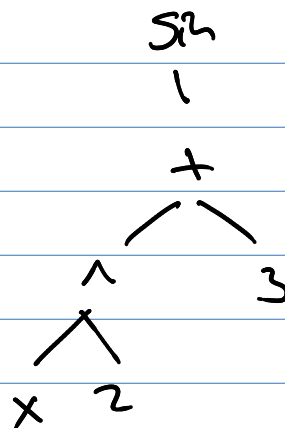
Pre : +, 2, 3 (pre fix)
in : 2, +, 3 (in fix)
post : 2, 3, + (post fix)

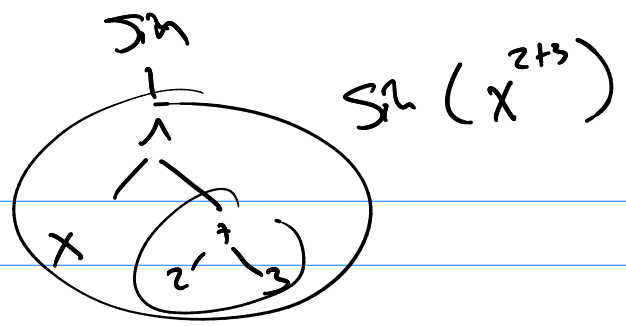
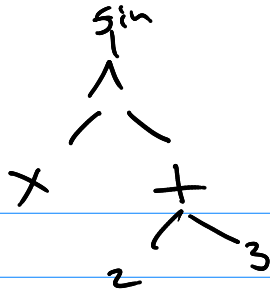


Pre : sin, x
in : x, sin
post : x, sin

$\sin(x^2 + 3)$

pre fix: sin, +, 1, x, 2, 3
in fix: x, 1, 2, +, 3, sin
post fix: x, 2, 1, 3, +, sin





Exam 2

11 probs @ 10pts

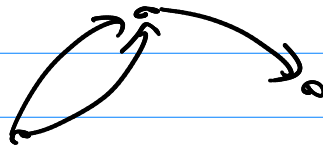
10pts = 100%

Graphs | ch9

8 probs

① Name that graph or Draw that graph

(ex) - draw K_6
- name

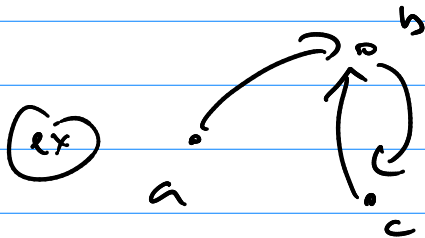


directed multigraph

② draw with given properties

(ex) - draw an undirected ^{simple} graph with 7 vertices
and only 2 have odd degree.

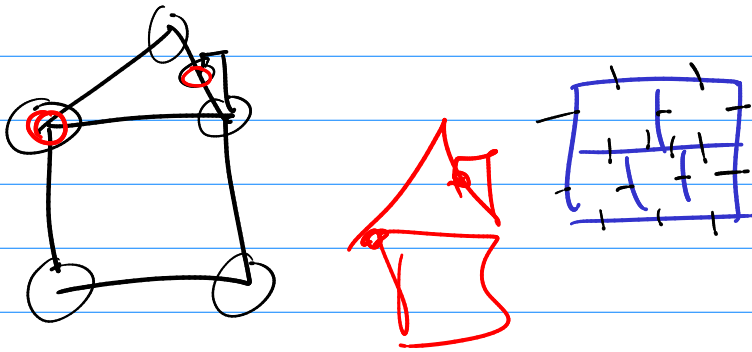
③ given a graph state requested paths.



- give simple circuit: c, b, c
- non-simple path: a, b, c, b, c

④/⑤ Isomorphic Graphs?

⑥ Euler Path or Circuit $\begin{cases} \rightarrow \text{trace?} \\ \rightarrow \text{cut path?} \end{cases}$



⑦ Hamilton

⑧ Dijkstra's

ch 10 trees

3 probs

① Decision Tree (ch based)

⑩ tree traversal

⑪ infix, prefix, postfix