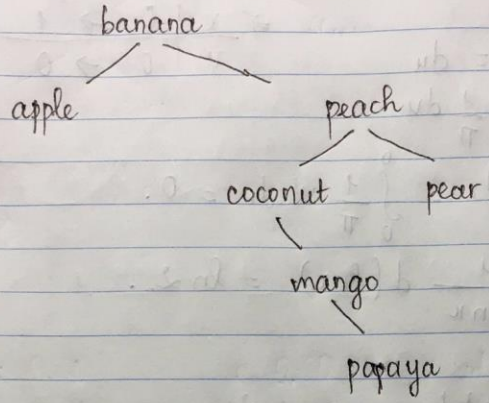
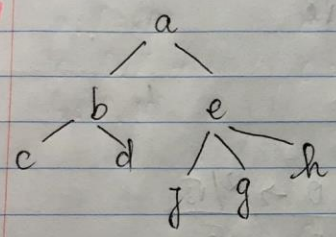
DMA - B05

Problem Set 12

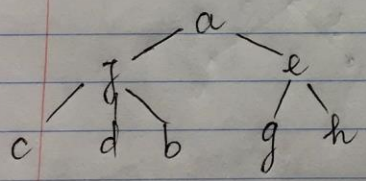
Problem 1 :



Problem 2

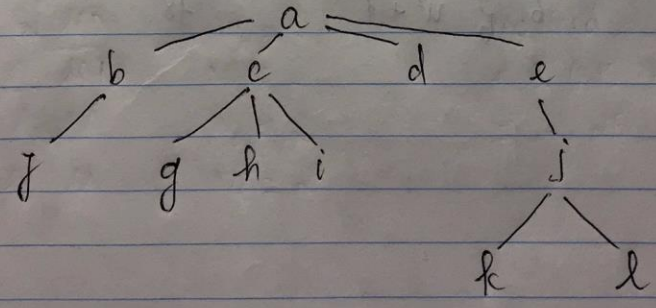


Post-order : c-d-b-f-g-h-e-a

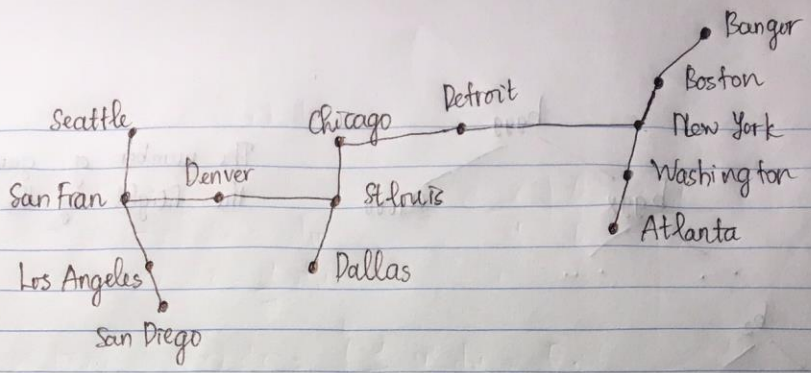


Post-order : c-d-b-f-g-h-e-a

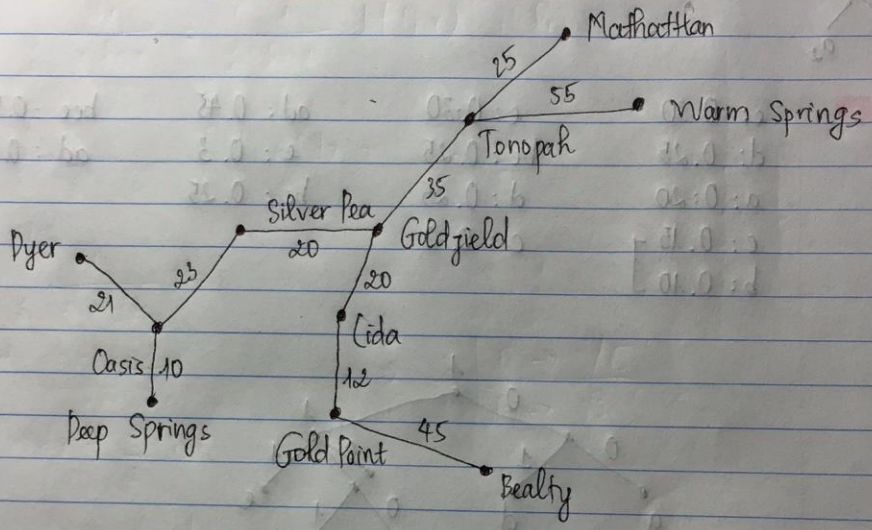
Problem 3



Problem 4



Problem 5



Problem 6 Let G be a tree.

By the definition of a tree, G is connected has $n-1$ edge.

Theorem: A tree with n vertices has $n-1$ edges

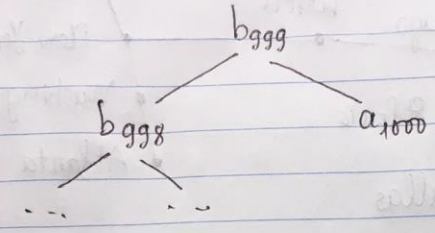
This was proven by using a proof by introduction on the number of vertices n.

→ G is connected and has $n-1$ edges.

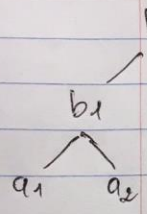
Problem 7 Suppose $a_1, a_2, a_3 \ldots a_{1000}$ are the people in the four ament.

Suppose a_1, a_2 and b_1 is winner.

Suppose b_1, a_3 and b_2 is winner.



The number of game is the height of the tree : 999.



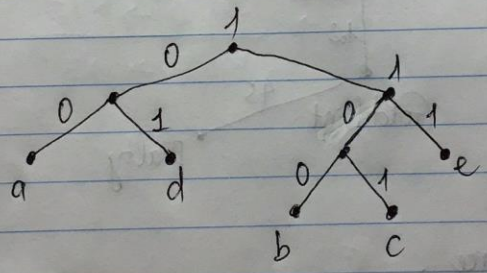
Prolem 8 :

e; 0.30
d: 0.25
a: 0.20
c: 0.15
b: 0.10

e: 0.30
bc: 0.25
d: 0.25
c: 0.2

ad: 0.45
e: 0.3
bc: 0.25

bce : 0.55
ad : 0.45



a: 00 $w_a = 2$
b: 100 $w_b = 3$
c: 101 $w_c = 3$
d: 01 $w_d = 2$
e: 11 $w_e = 2$

→ Average number of bits required = $2.0,2 + 3.0,1 + 3.0,15 + 2.0,75 + 2.0,3 = 2,25$