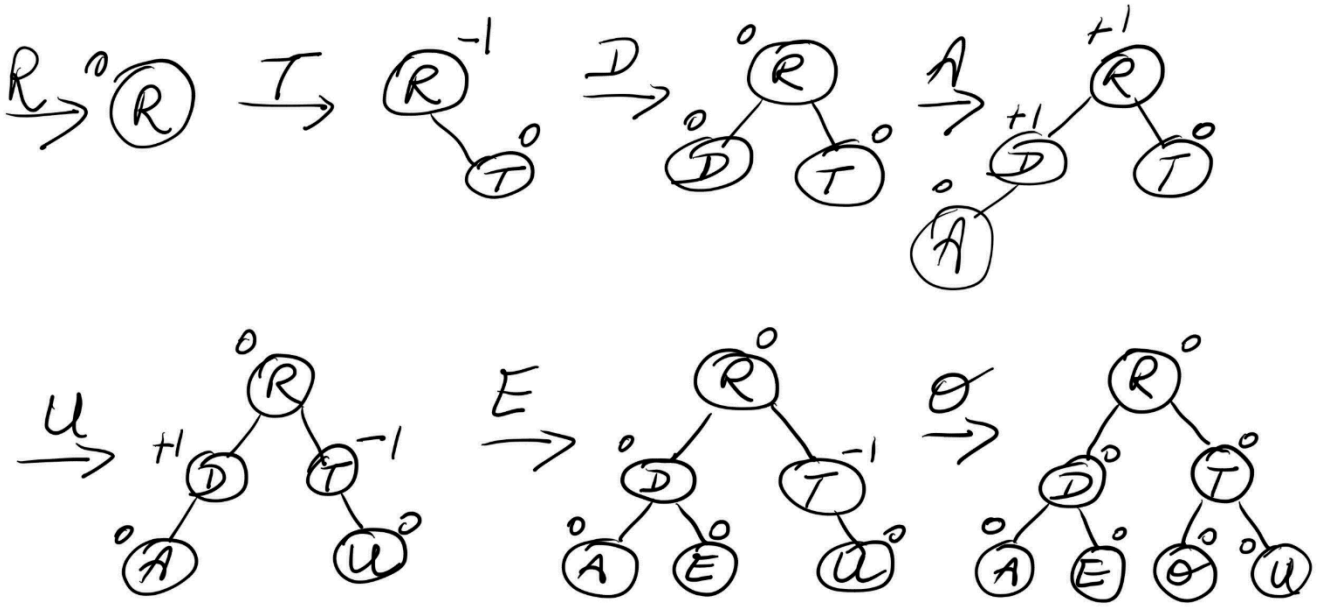
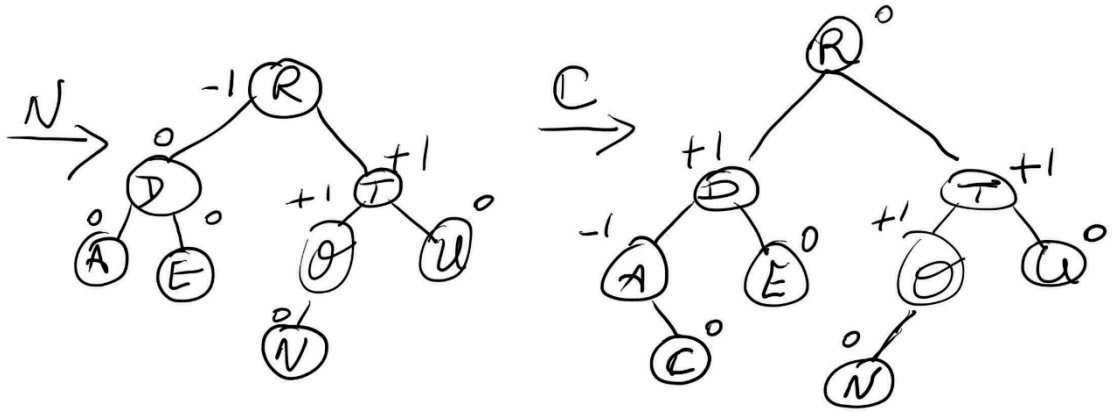
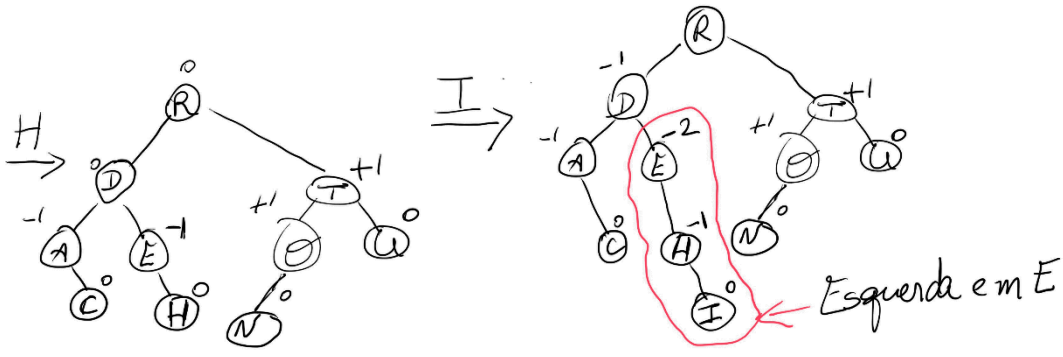
Exercícios sobre Árvores AVL

Mostre passo a passo como é construída a árvore AVL fazendo a inserção dos valores na ordem que aparecem. Deve haver um diagrama para cada nó inserido, bem como, um diagrama para cada rotação. Obrigatório, também mostrar o fator de balanceamento de cada nó em todos os diagramas.

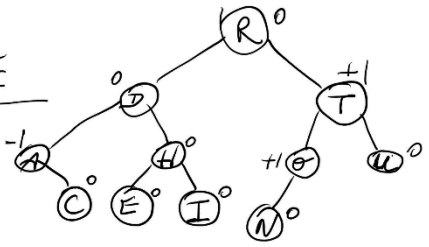
I. R, T, D, A, U, E, O, N, C, H, I, P, S, F



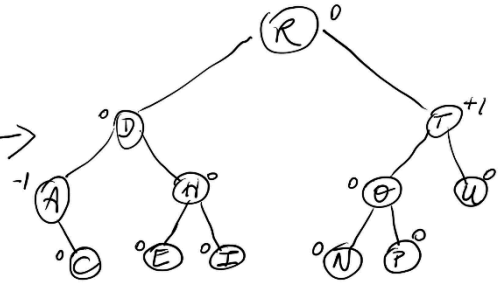




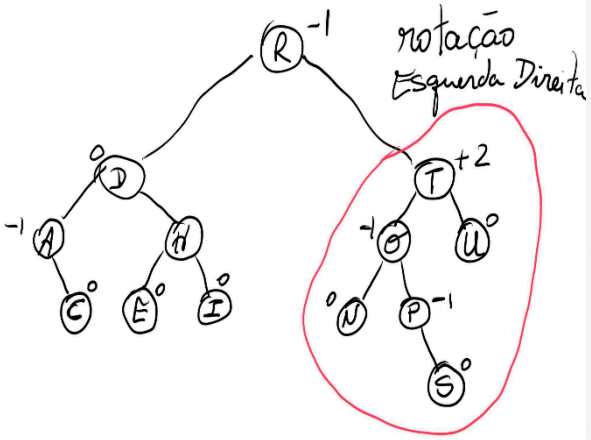
Esq em E



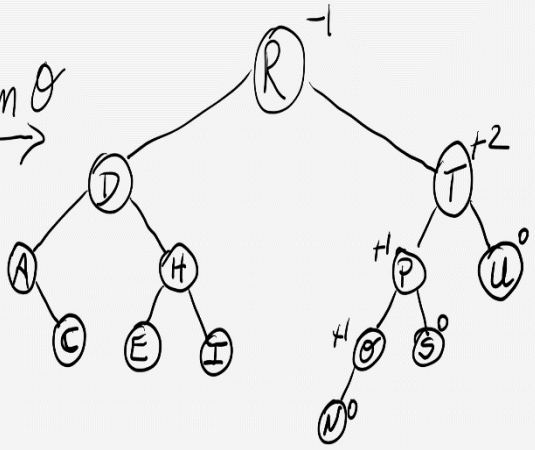
P



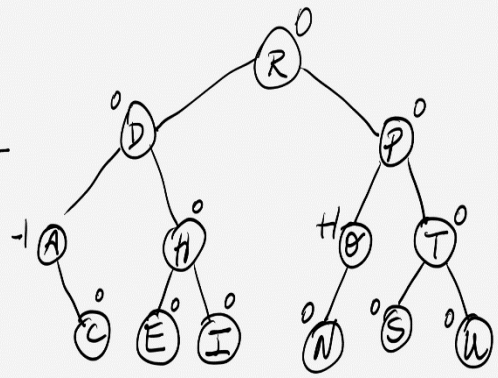
S



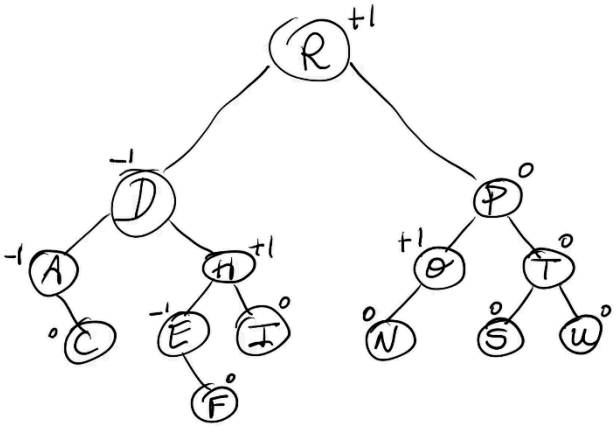
Esquerda em Q



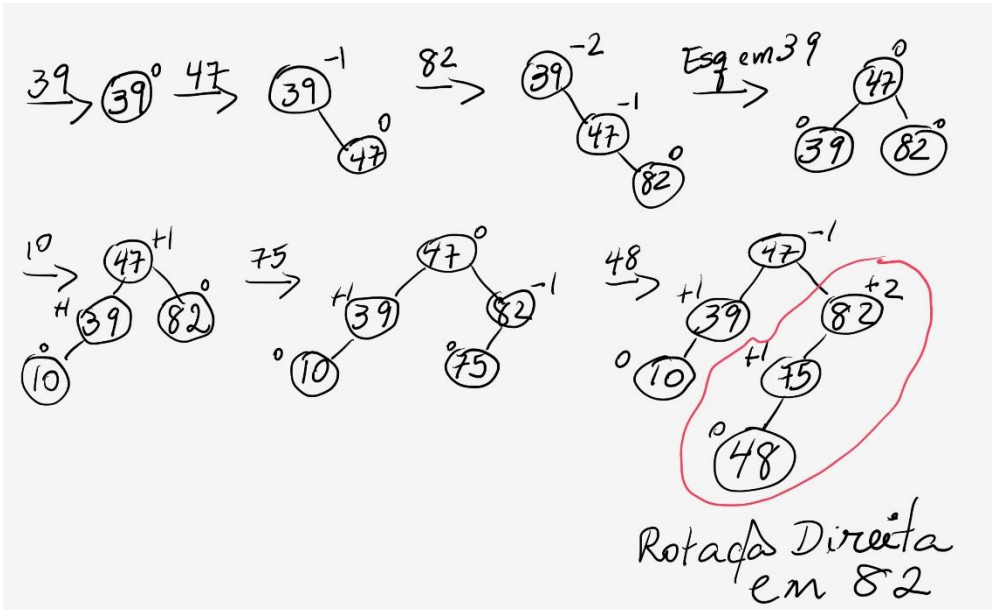
Direita em T

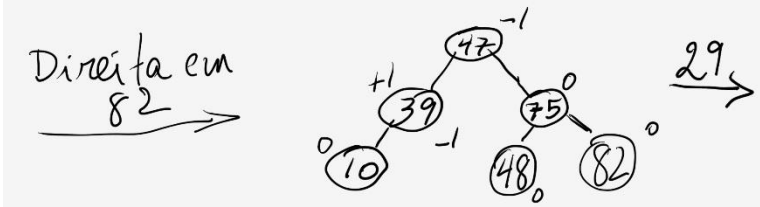


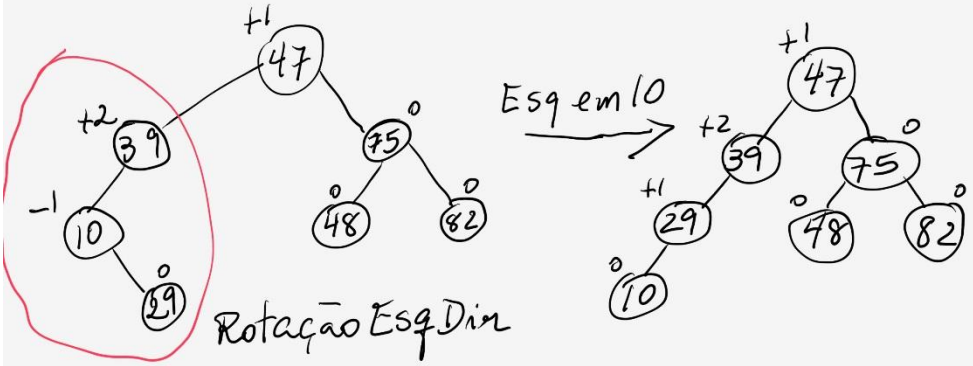
F

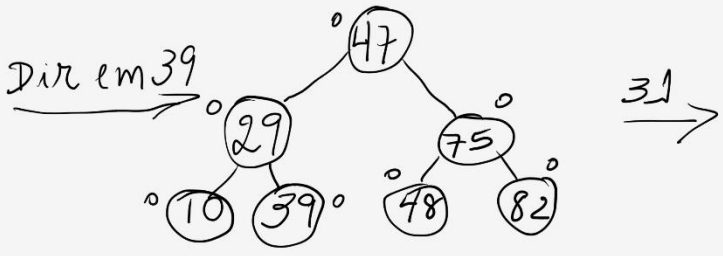


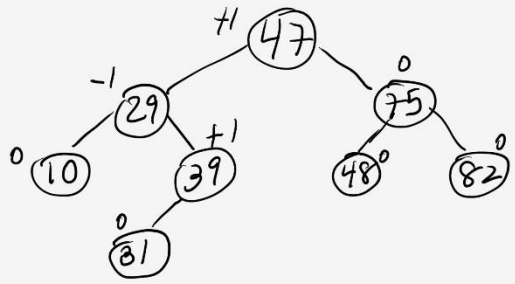
II. 39, 47, 82, 10, 75, 48, 29, 31, 13, 53 93, 68, 1

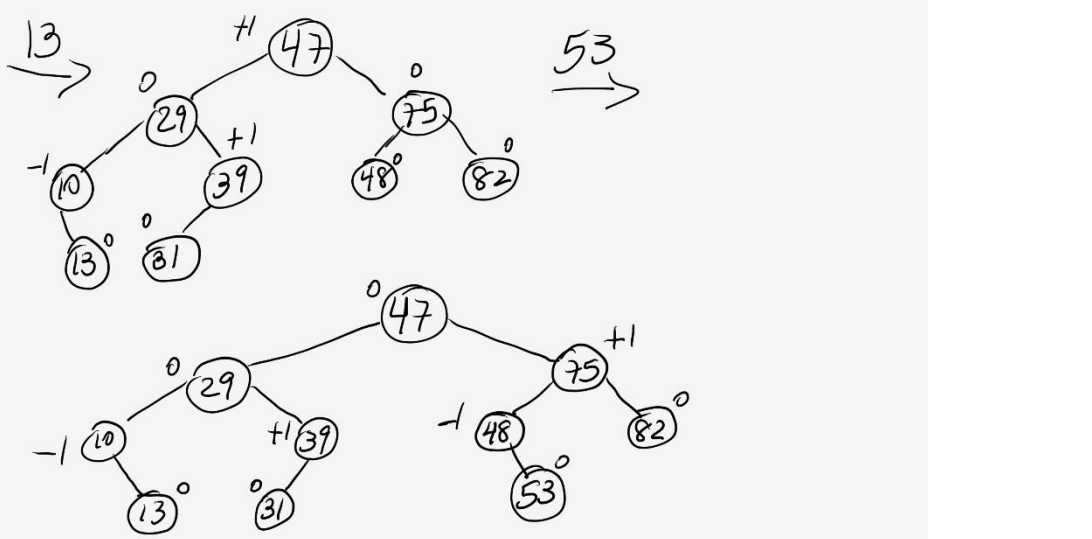


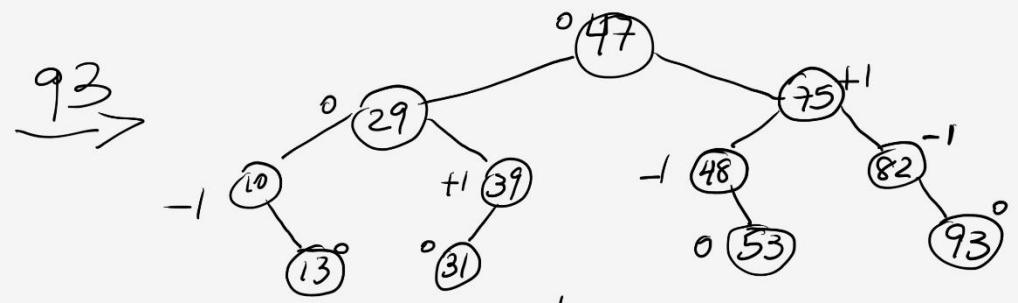


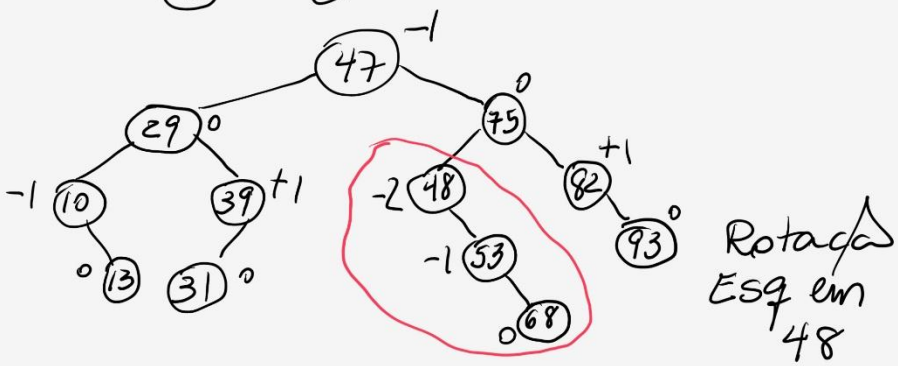


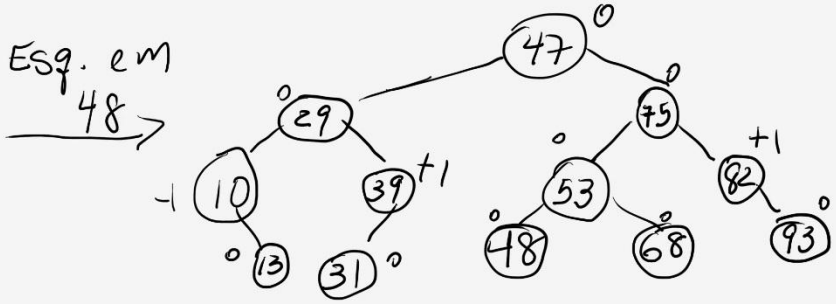


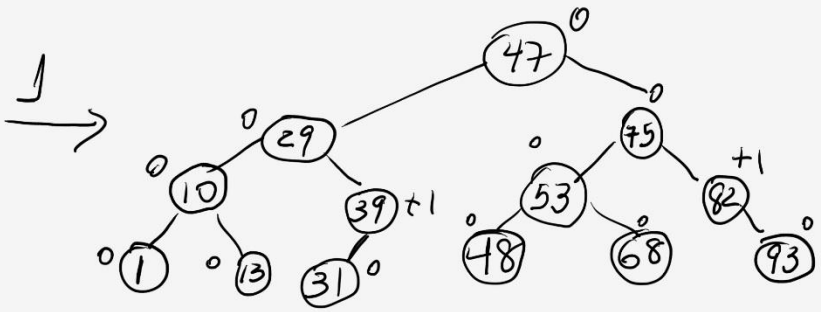



13
53

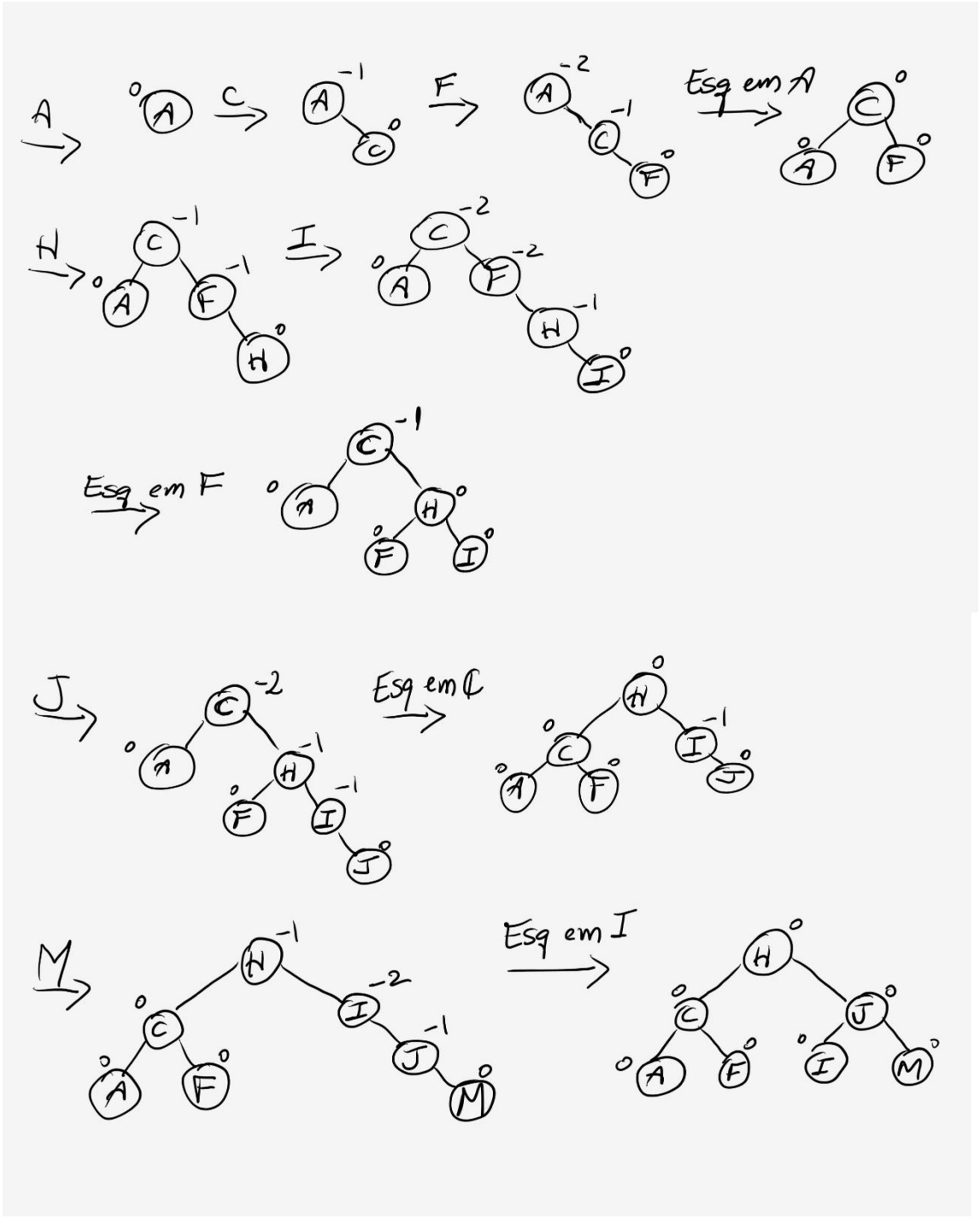

93


Rotação
Esq em
48

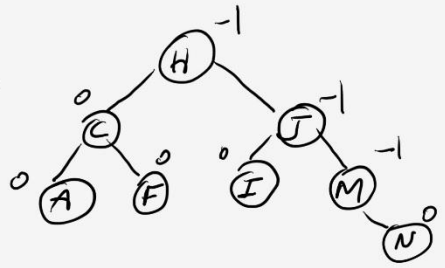

Esq. em
48


1

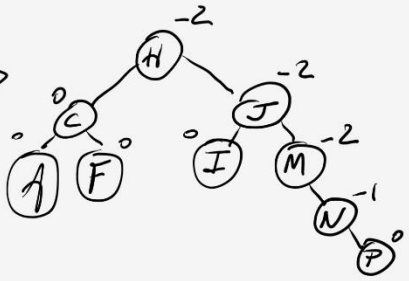
III. A, C, F, H, I, J, M, N, P, R, S, T, X, Z



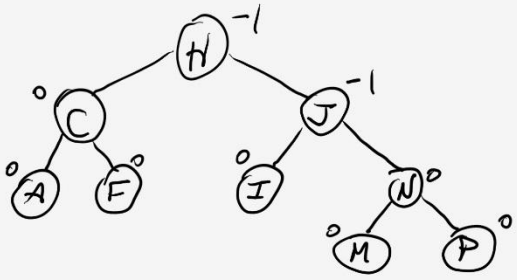
N →


H -1
C 0
J -1
A 0
F 0
I 0
M -1
N 0

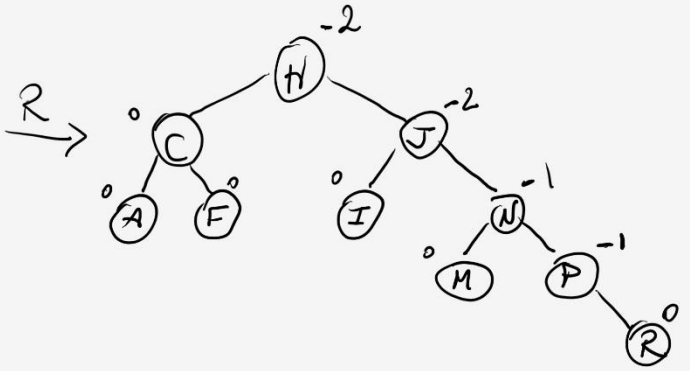
P →


H -2
C 0
J -2
A 0
F 0
I 0
M -2
N -1
P 0

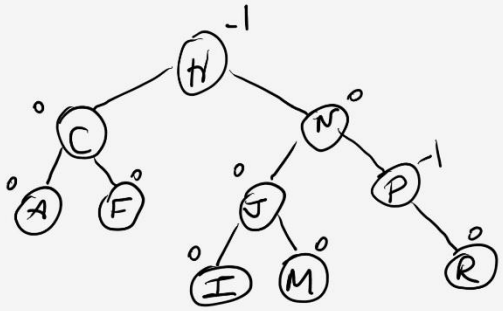
Esq em M →


H -1
C 0
J -1
A 0
F 0
I 0
N 0
M 0
P 0

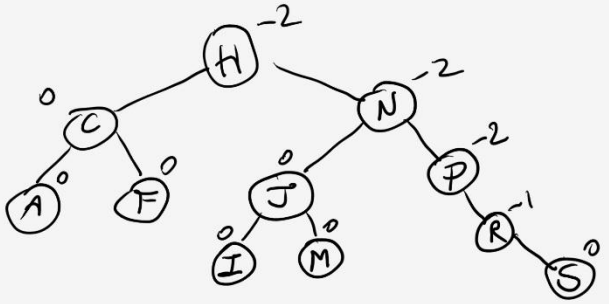
R →


H -2
C 0
J -2
A 0
F 0
I 0
N -1
M 0
P -1
R 0

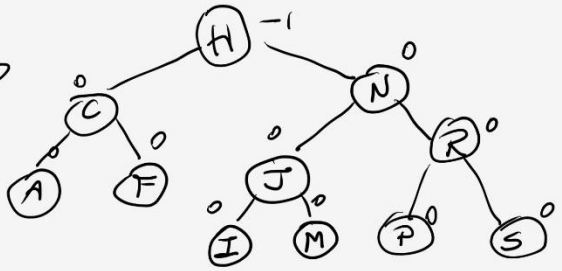
Esq em J



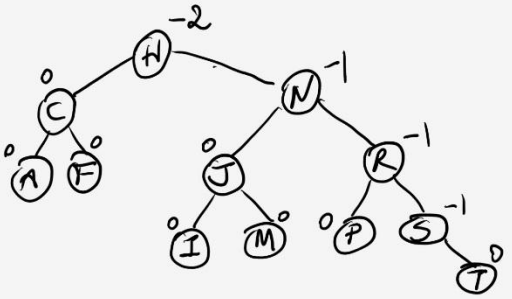
S



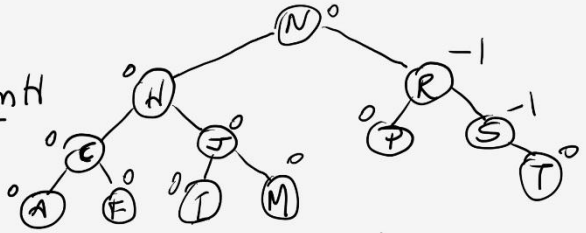
Esq em P



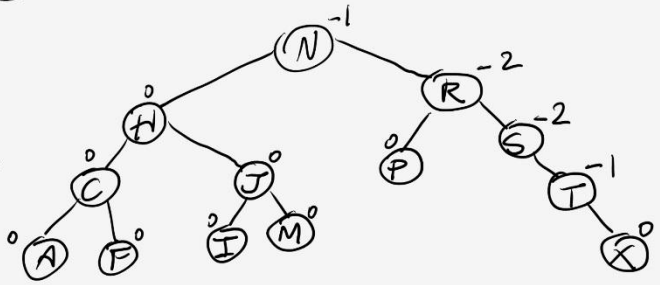
T

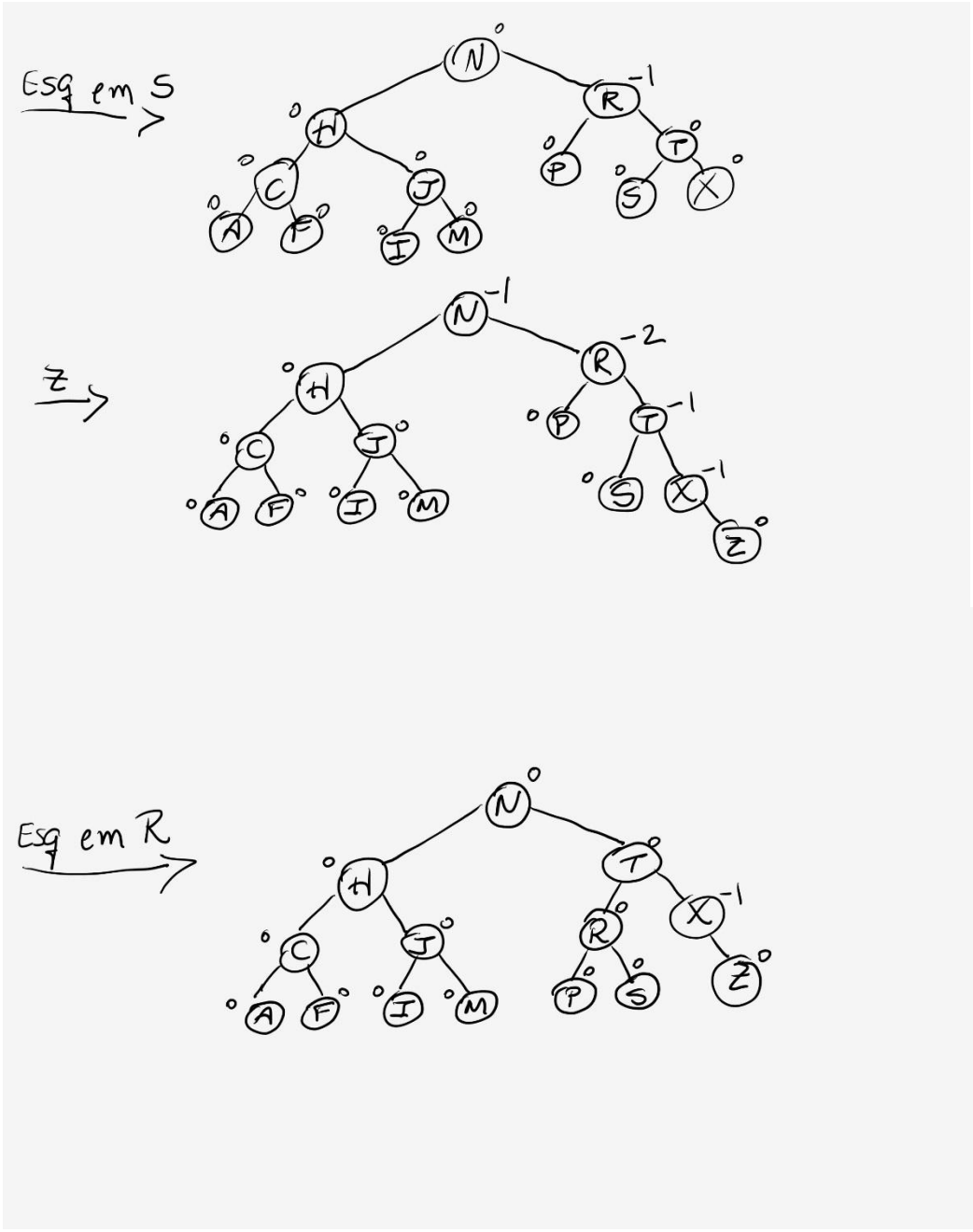


Esq em H



X



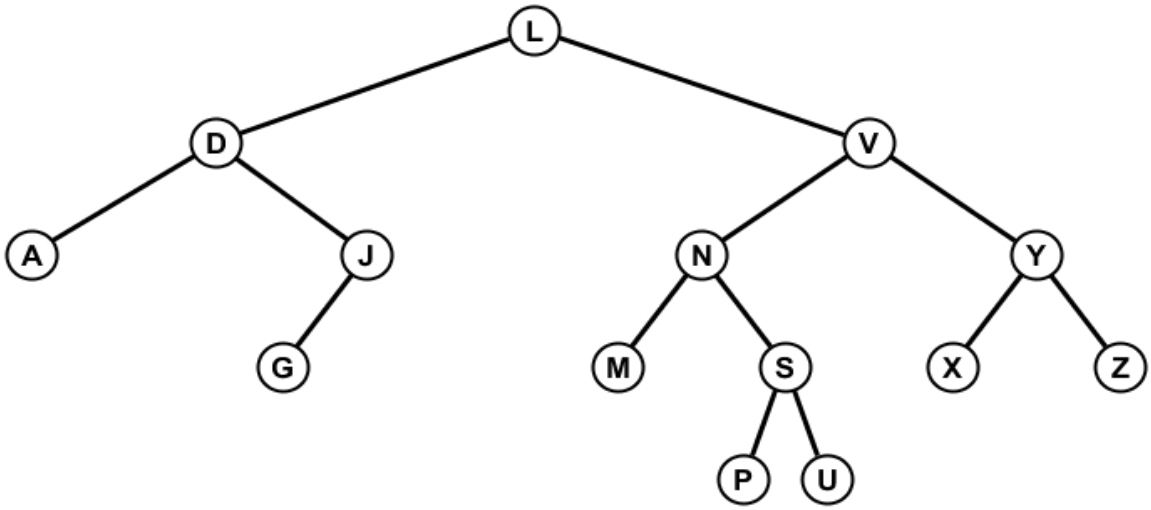


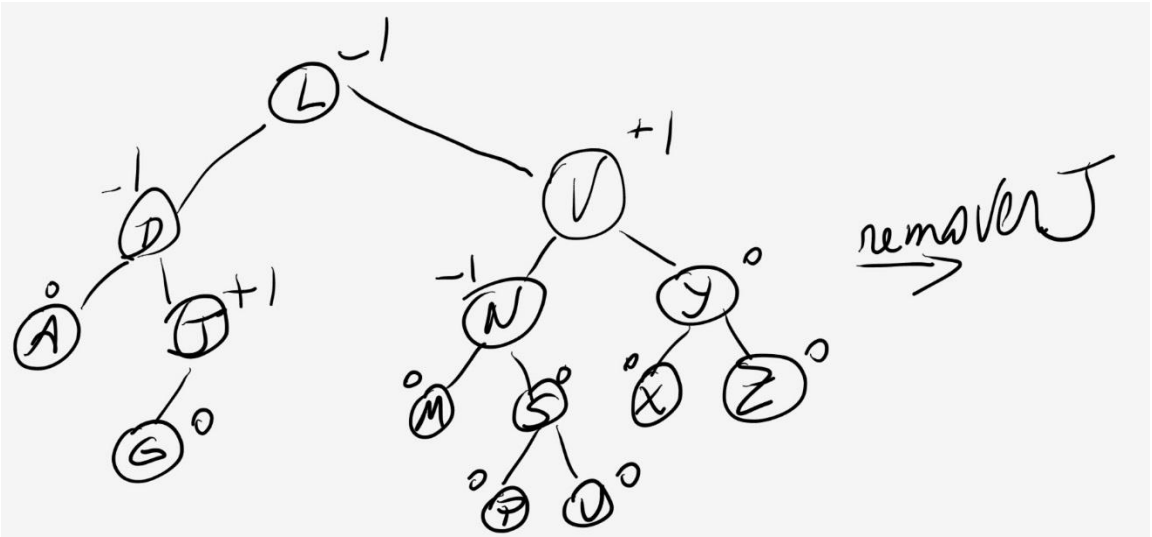
IV. 50, 32, 76, 25, 41, 64, 82, 18, 28, 79, 91, 38, 45, 58, 71

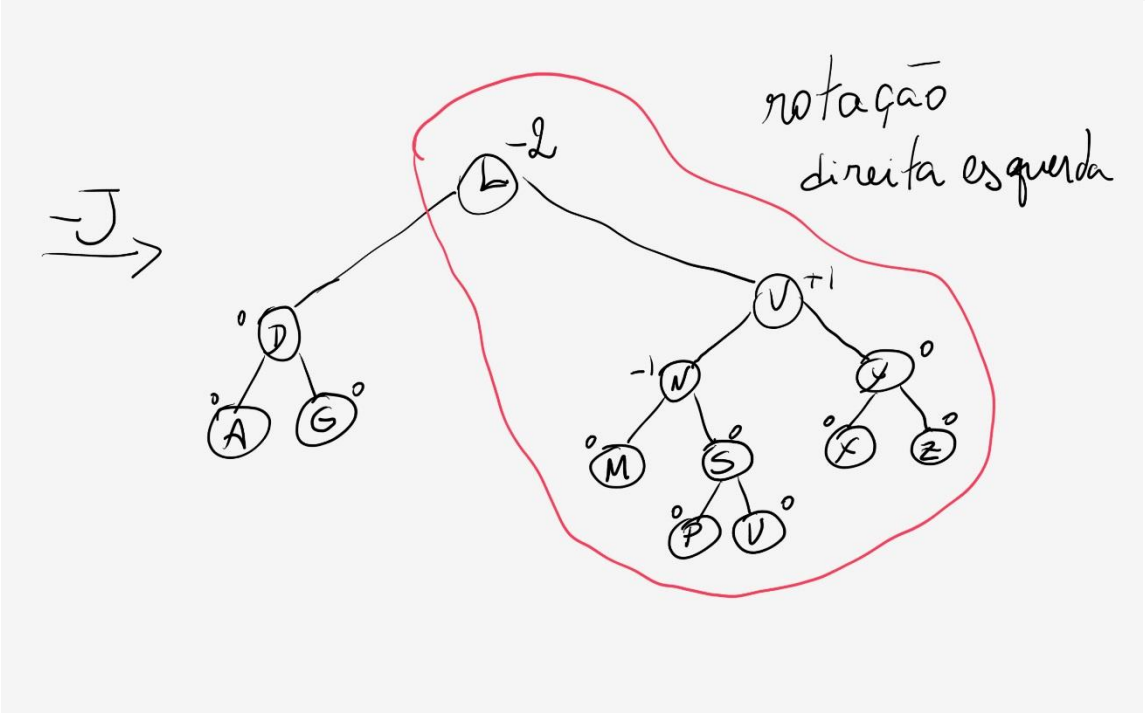
V. 23, 34, 45, 56, 67, 12, 87, 63, 18, 50, 31, 49, 15, 43, 82, 70, 75, 80

Mostre passo a passo como é feita a remoção dos nós das AVL a seguir. Siga as instruções sobre a ordem que devem ser retirados os nós. Vale repetir as instruções anteriores: Deve haver um diagrama para cada nó removido, bem como, um diagrama para cada rotação. Obrigatório, também mostrar o fator de balanceamento de cada nó em todos os diagramas.

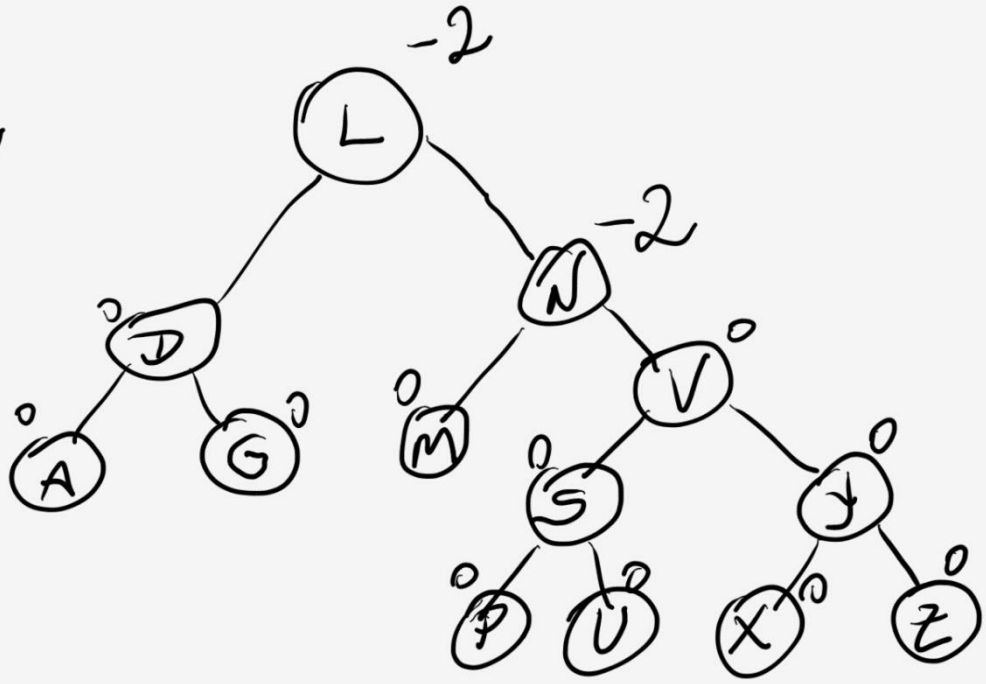
I. Ordem de remoção: J, N, M, S, D, X, L, Y, U, V


L
D
V
A
J
N
Y
G
M
S
X
Z
P
U

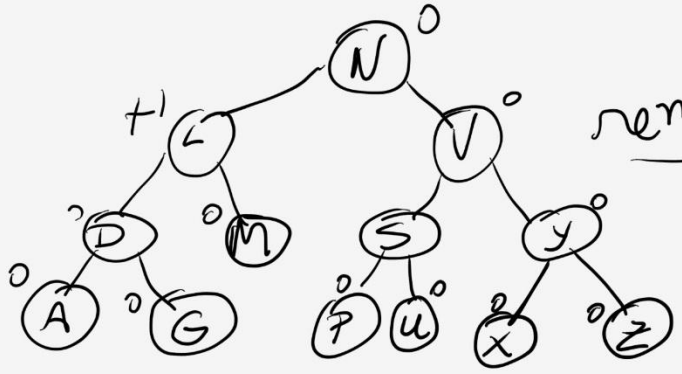

-1
L
+1
-1
D
V
remover J
-1
+1
N
Y
A
J
M
S
X
Z
G
P
U


rotação
direita esquerda
-J
-2
L
+1
V
D
-1
N
Y
A
G
M
S
X
Z
P
U

dir em V



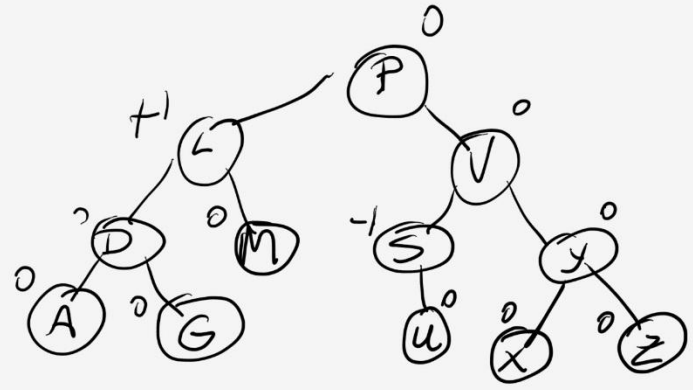
esq em L



remover o N

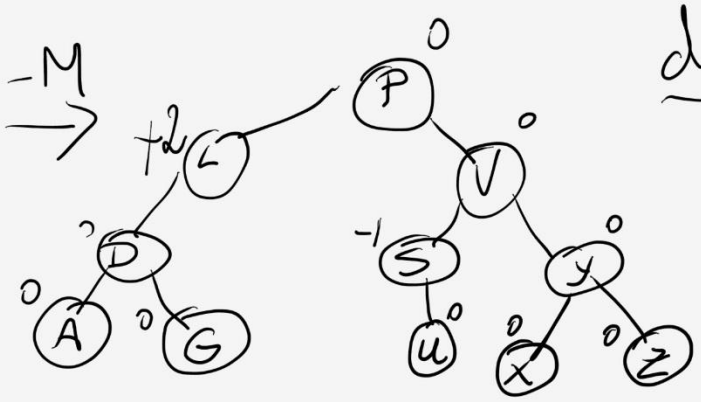
minha escolha será o menor sucessor (P)

-N

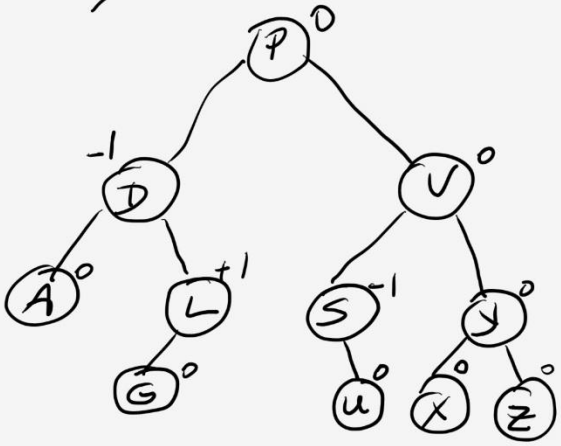


remover o M

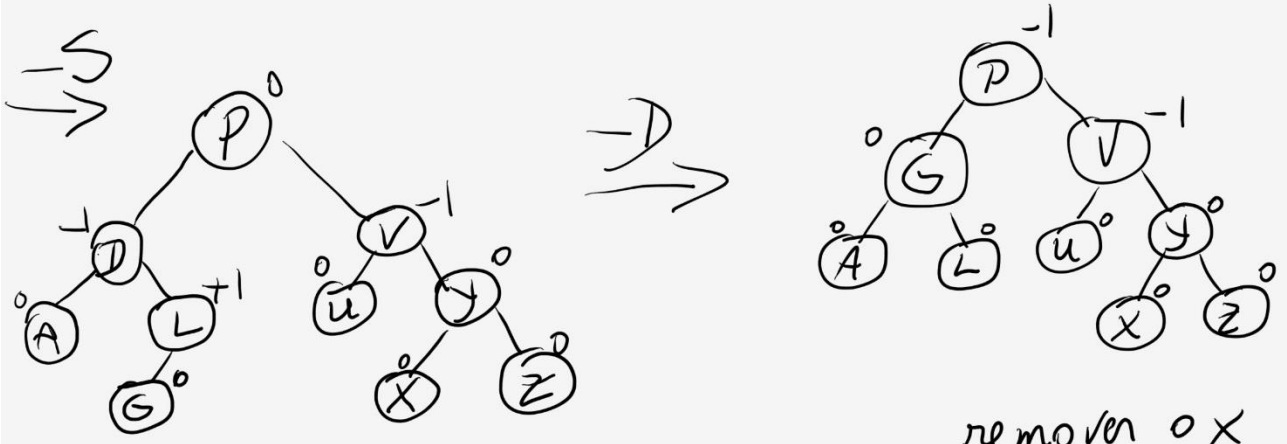
-M



dir em L



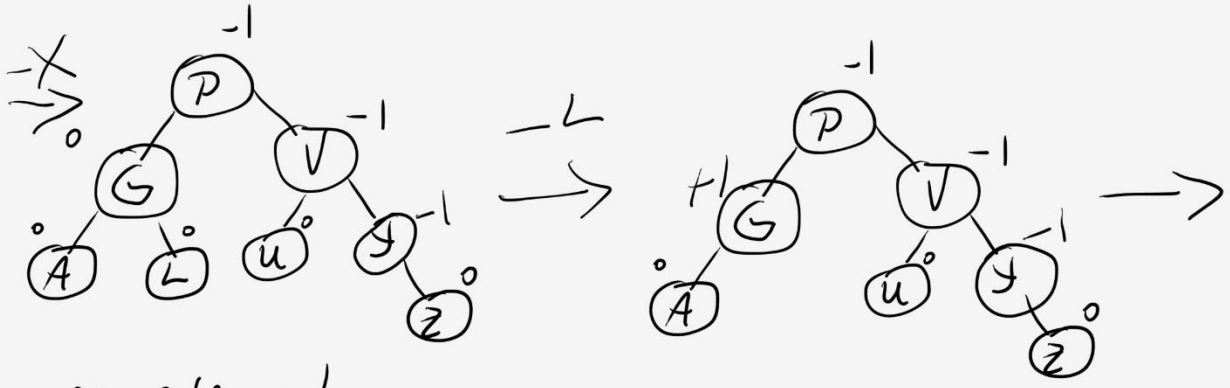
remover S



remover o D

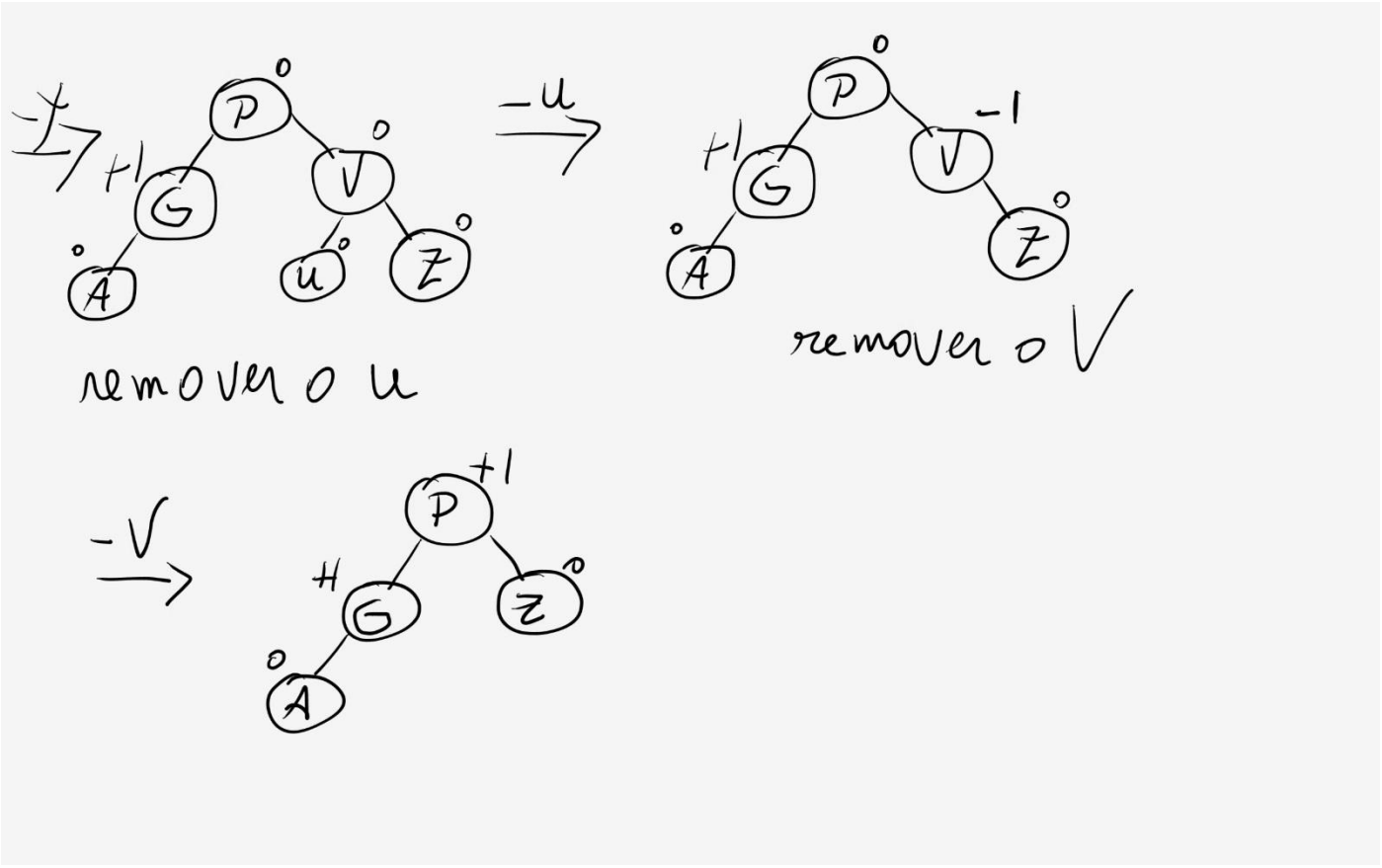
escolho o maior sucessor(G)

remover o X

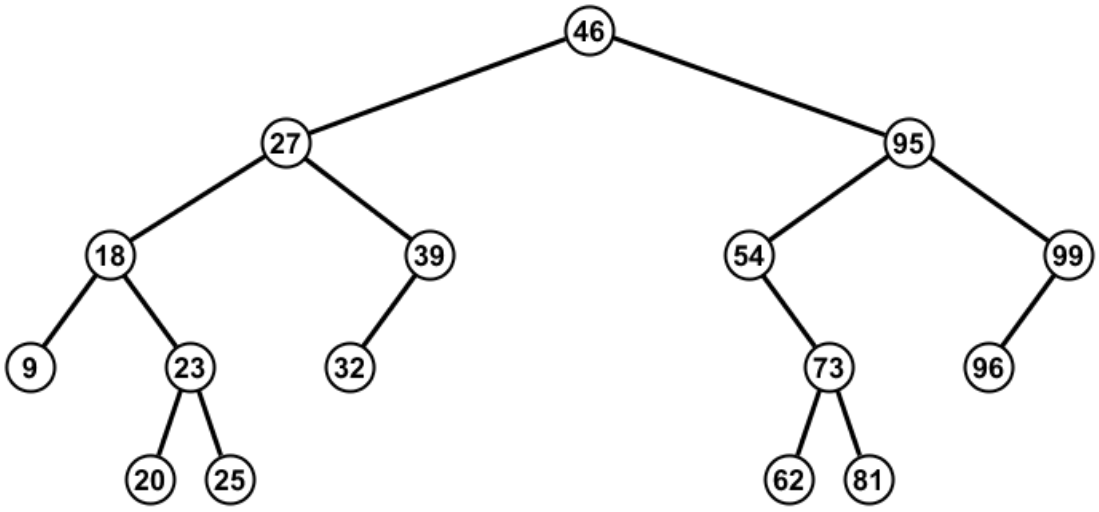


remover o L

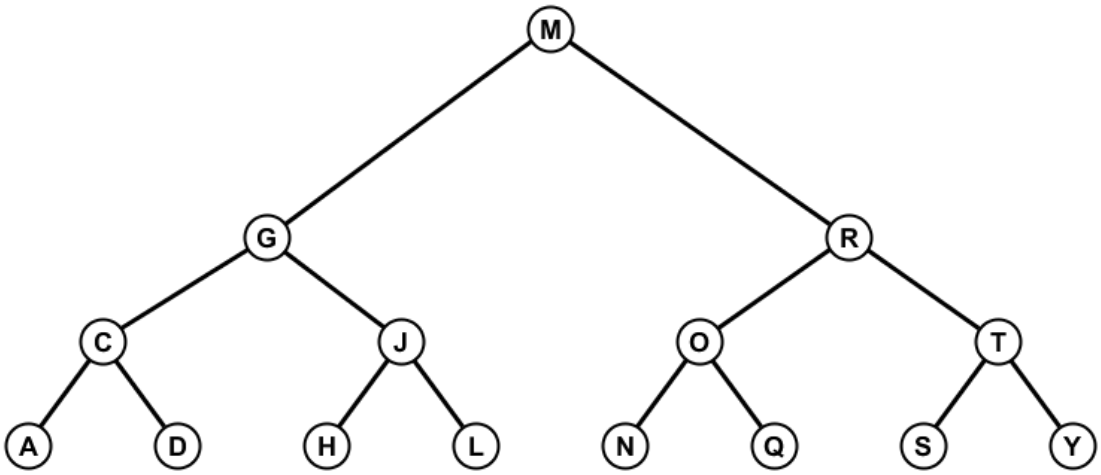
remover o y



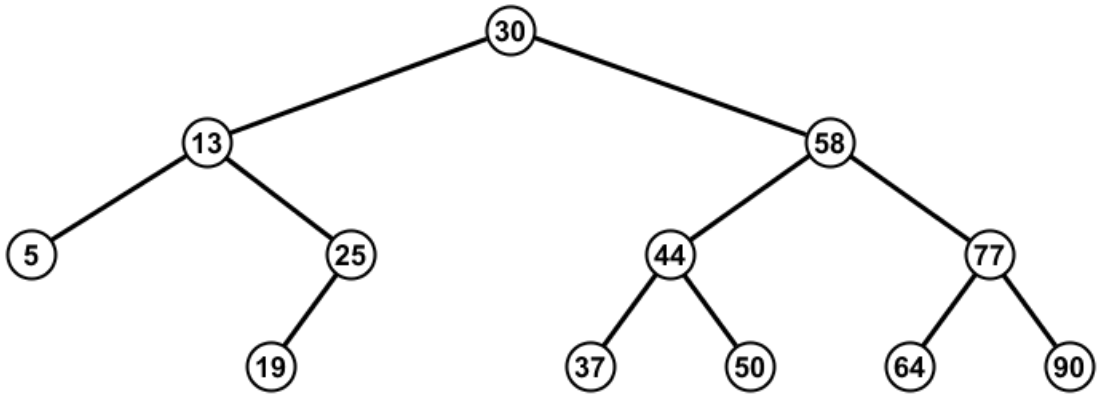
II. Ordem de remoção: 95, 54, 27, 39, 62, 81, 18, 23, 42, 73



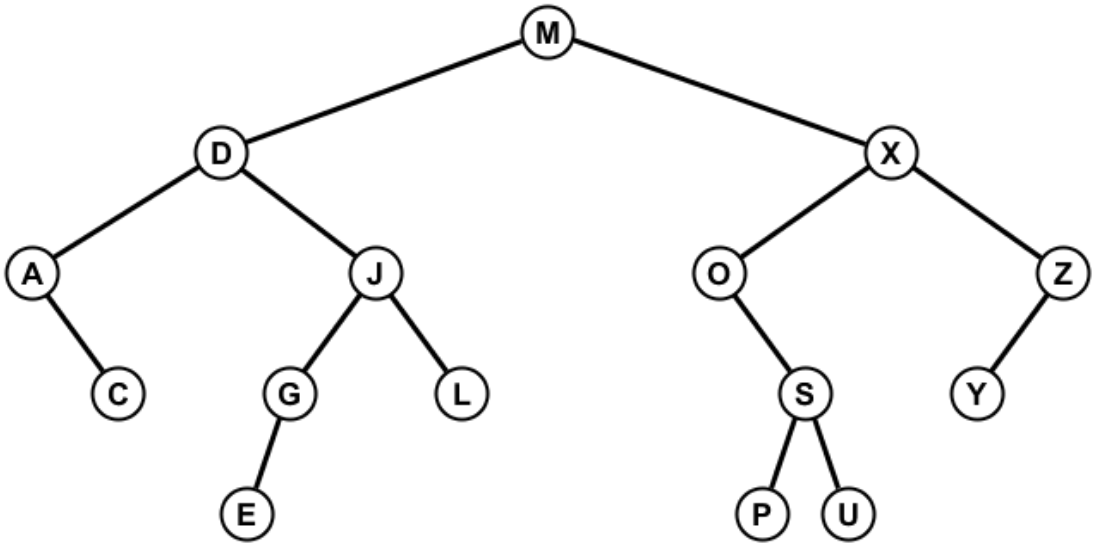
III. Ordem de remoção: G, C, O, R, D, J, H, M, T, S



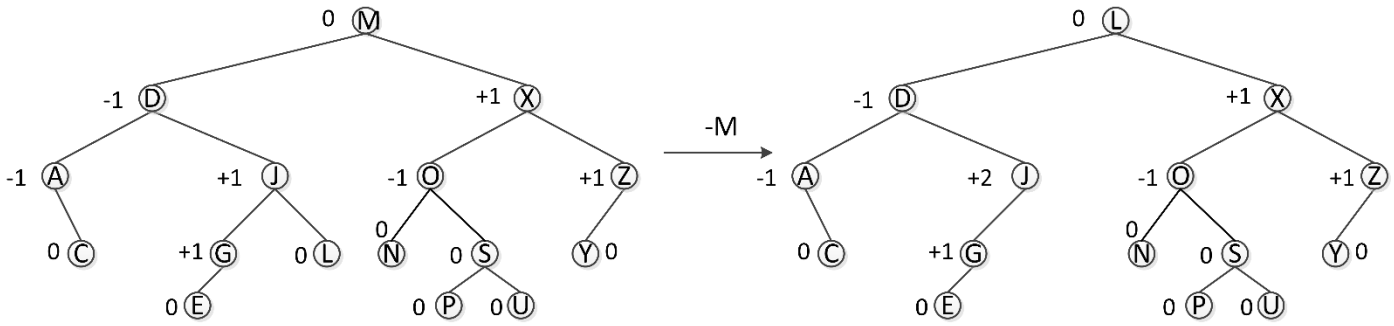
IV. Ordem de remoção: 25, 13, 58, 44, 30, 77, 50, 64, 19



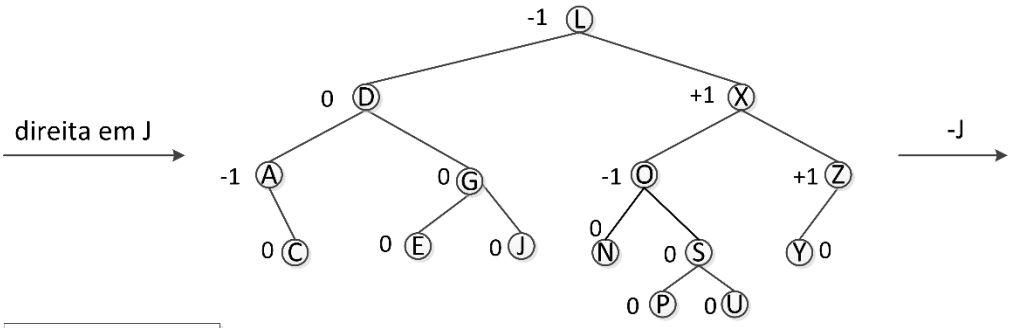
V. Ordem de remoção: M, J, D, Z, X, S, G, P, L, O



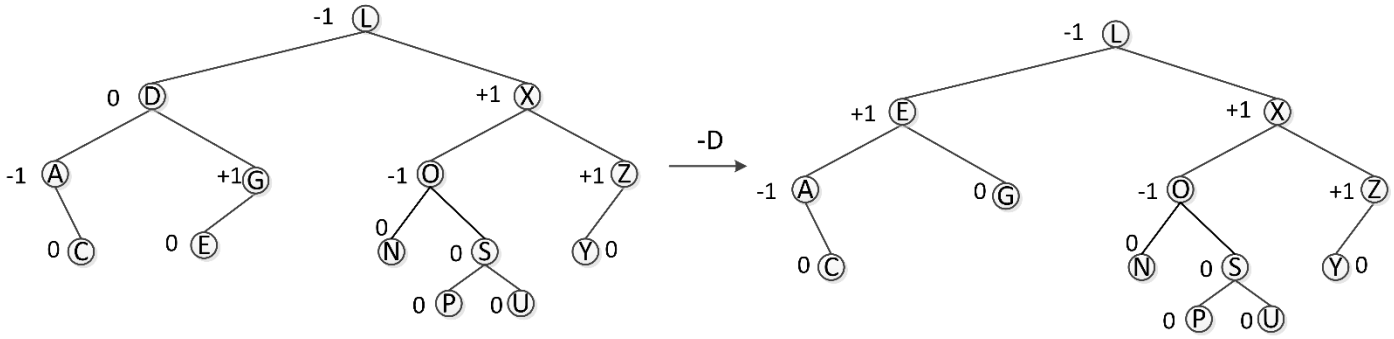
remoção: M, J, D, Z, X, S, G, P, L, O



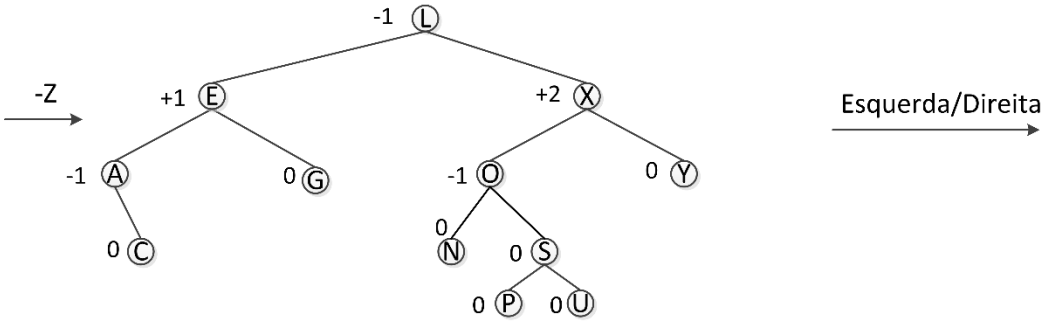
Escolhendo o maior antecessor(L), pois, este é nó folha



remoção: M, J, D, Z, X, S, G, P, L, O

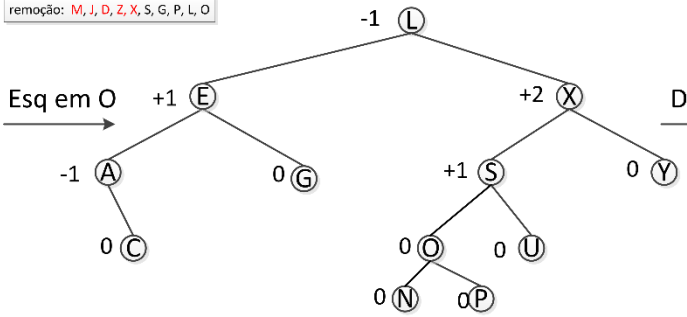


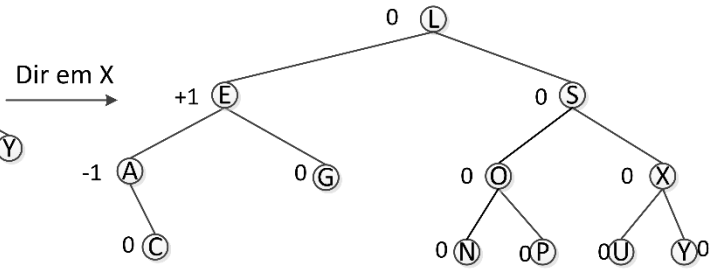
Tanto faz C ou E, pois ambos são folhas

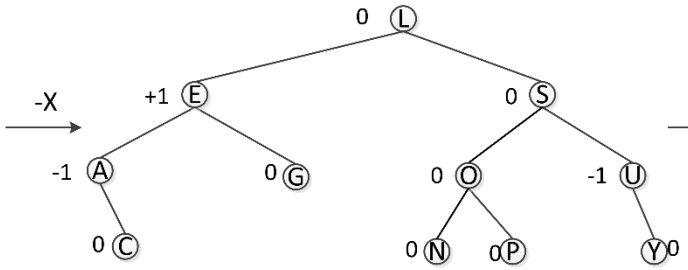


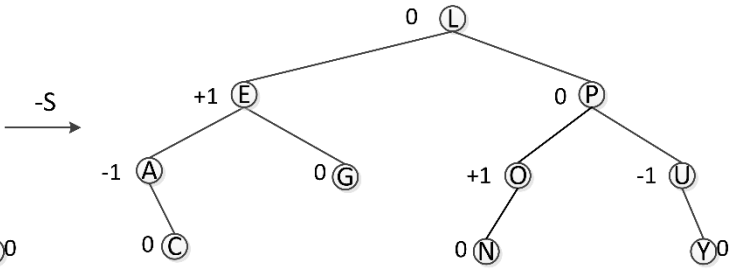
Esquerda/Direita

remoção: M, J, D, Z, X, S, G, P, L, O



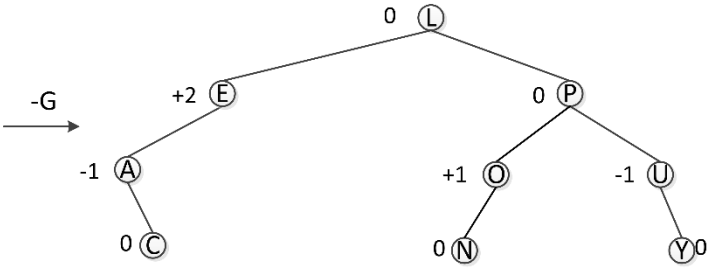




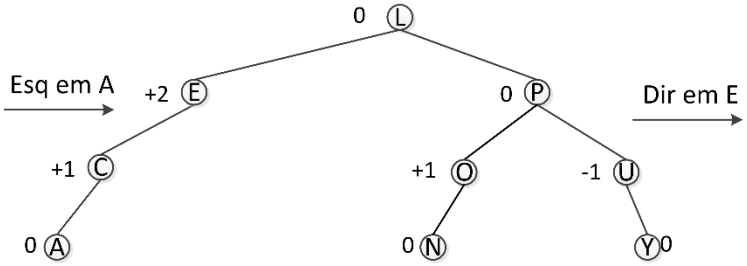


Tanto faz U ou Y, pois ambos são folhas

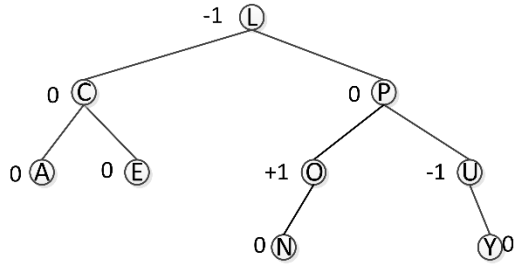
Usando o maior antecessor(P), pois, este é folha

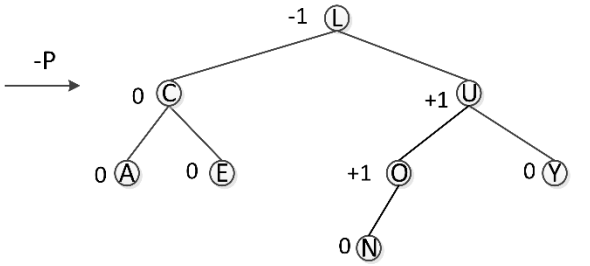


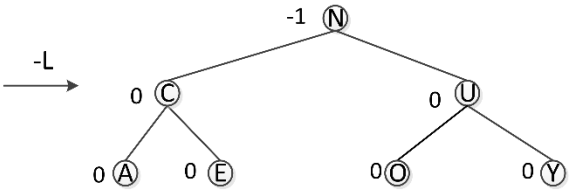
Esquerda/Direita



Dir em E







Tanto faz E ou N, pois ambos são folhas