

Problema AVL

1- En un árbol AVL, inserta los siguientes valores (por este orden) 49, 27, 5, 45, 50, 41, 17 y luego elimina 45, 41 y 27, mostrando en cada paso qué rebalanceos hay que realizar. Indicar el tipo de rotaciones que se producen y donde, dibujando el árbol tal como quedaría tras cada una de las operaciones.

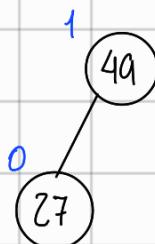
Insertar: 49, 27, 5, 45, 50, 41, 17

Eliminar: 45, 41, 27

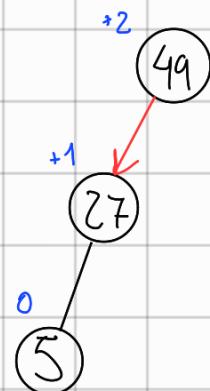
Insertar: 49



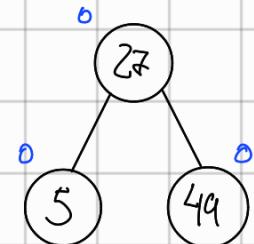
Insertar: 27



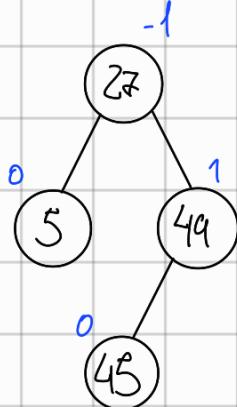
Insertar: 5



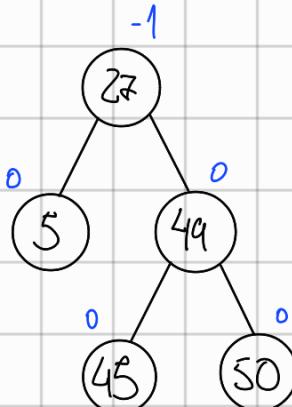
Rotación II en 49
→



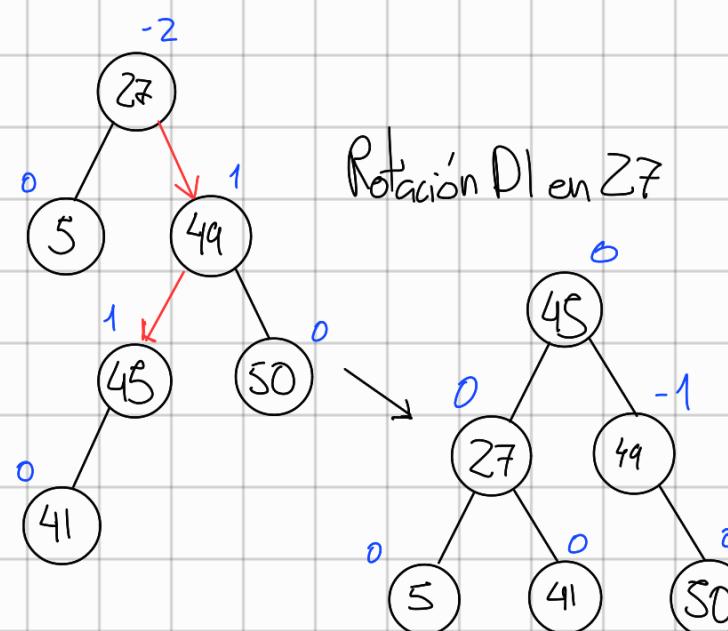
Insertar: 45



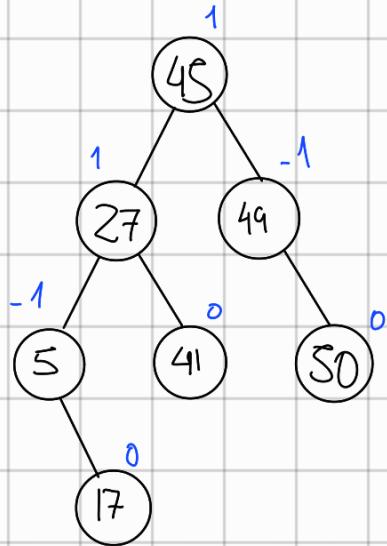
Insertar 50:



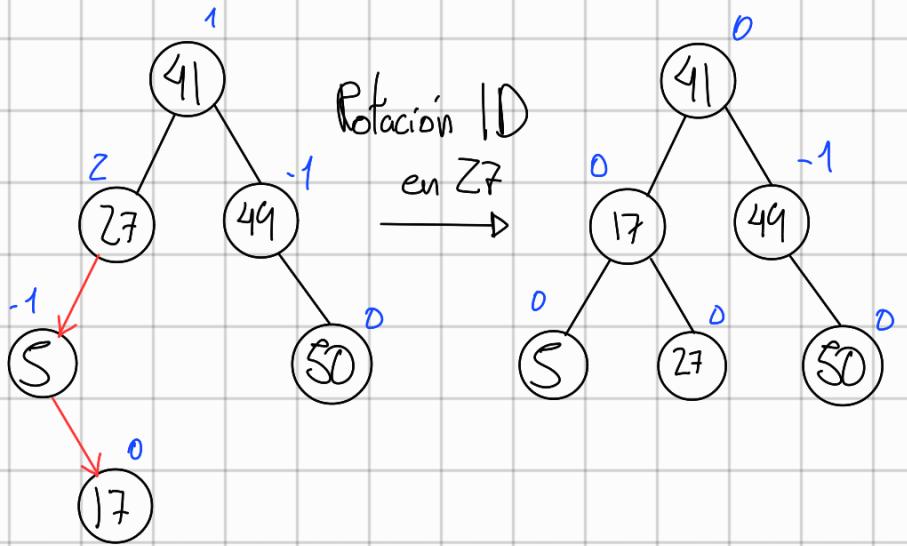
Insertar 41:



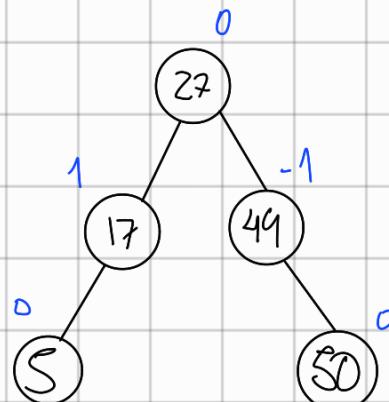
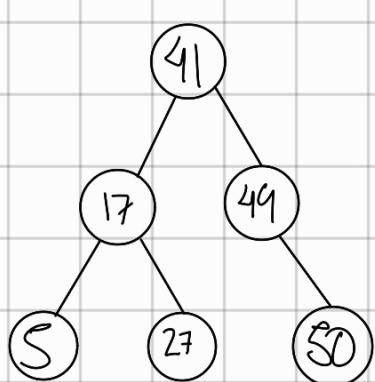
Insertar: 17



Eliminar: 45

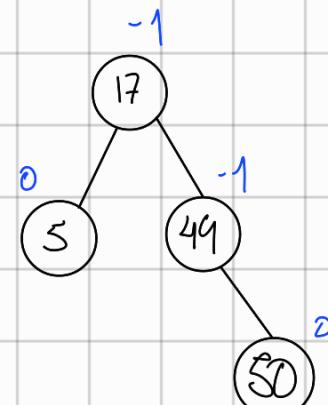
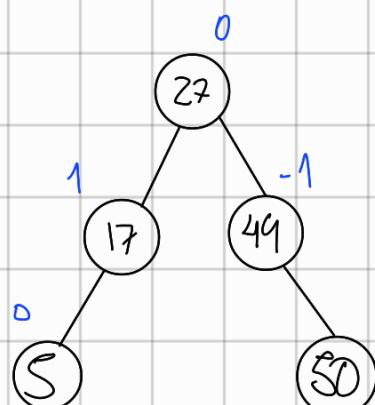


Eliminar: 41



El nodo a eliminar tiene dos hijos, buscar el nodo mas grande del subárbol izquierdo.

Eliminar: 27



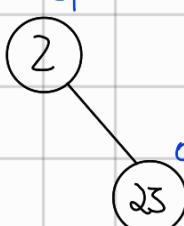
En el caso que no haya nodo izquierdo coge el nodo padre del subárbol eq

2.- En un árbol AVL, inserta los siguientes valores (por este orden) 2, 23, 45, 5, 1, 9, 33 y luego elimina 5, 9 y 23.

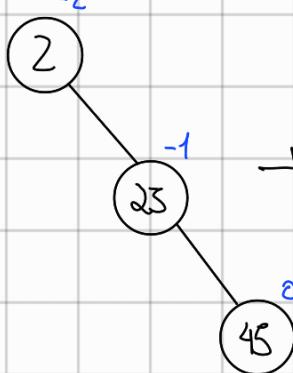
Insertar: 2



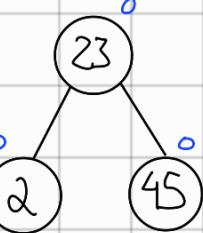
Insertar: 23



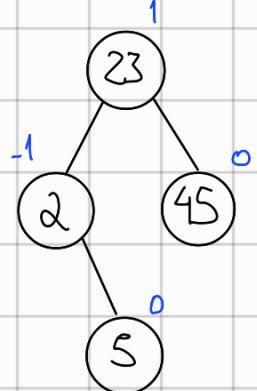
Insertar: 45



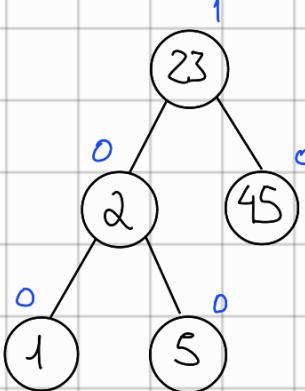
Rotación DD en 2



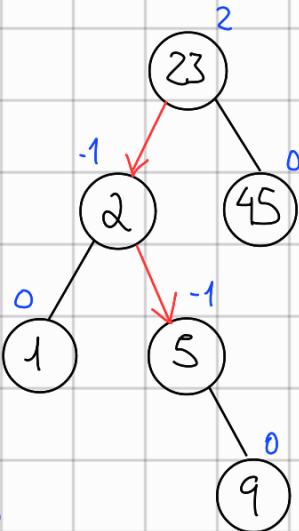
Insertar: 5



Insertar: 1

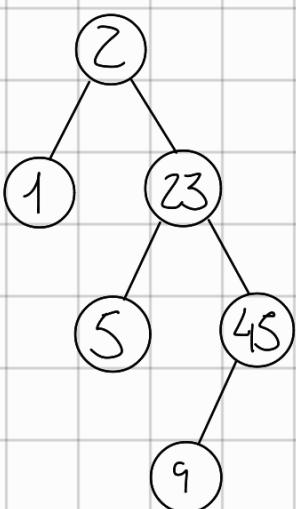


Insertar: 9

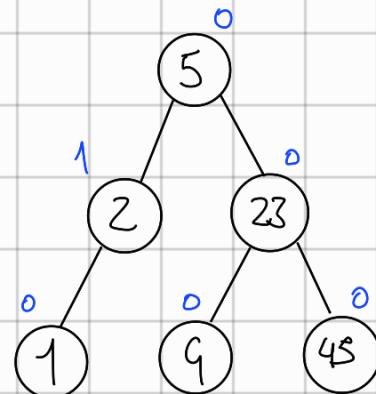


Rotación ID en 23

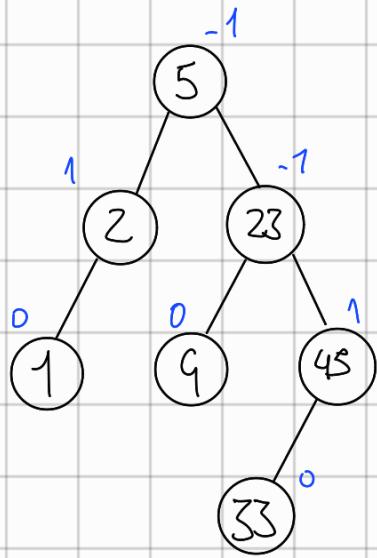
II en 2



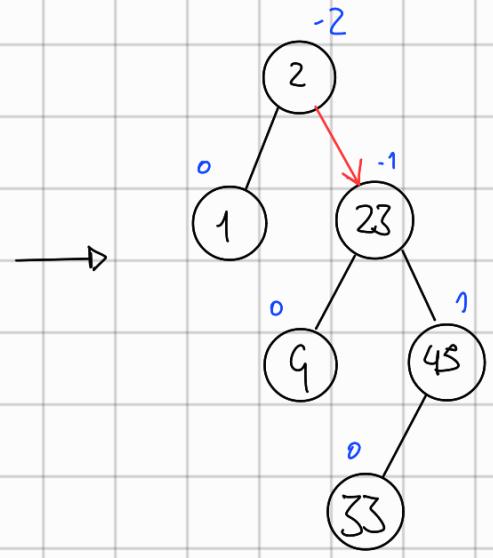
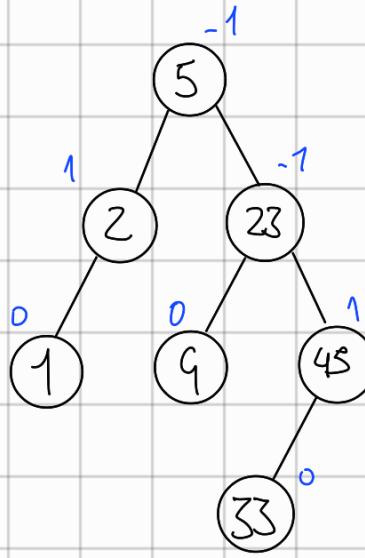
DD en 5



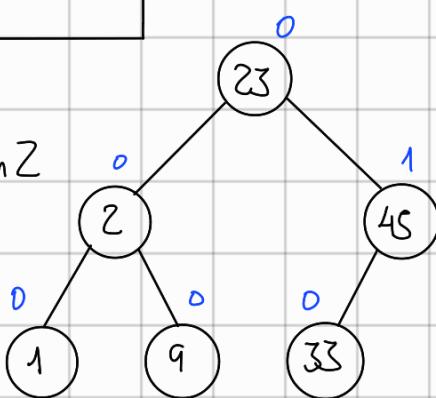
Insertar: 33



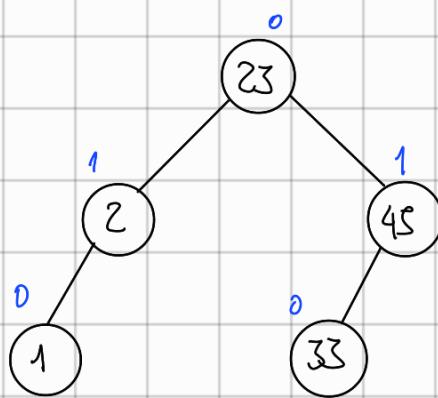
Eliminar: 5



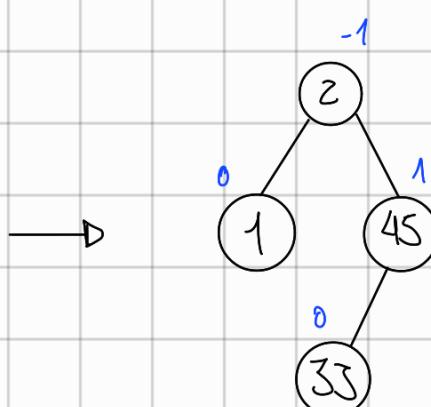
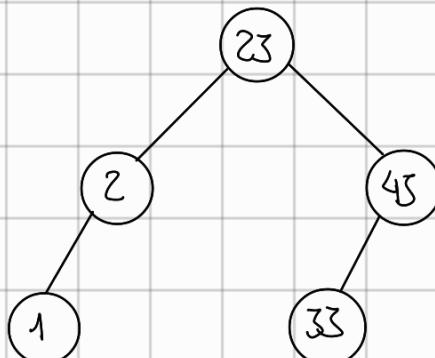
Rotación DD en 2



Eliminar: 9



Eliminar 23:



3.- En un árbol AVL, inserta los siguientes valores (por este orden) 46, 32, 15, 38, 50, 35, 23 y luego elimina 38, 35 y 32.

Insertar: 46

0

46

Insertar: 32

0

32

Insertar: 15

0

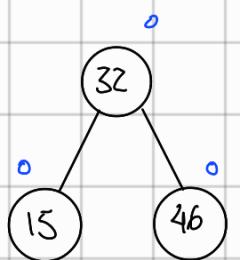
15

46

1

32

Rotación II en 46



Insertar: 38

0

32

-1

15

0

38

0

46

1

Insertar: 50

0

15

0

38

-1

32

0

46

0

50

Insertar: 35

0

15

0

38

1

46

0

50

0

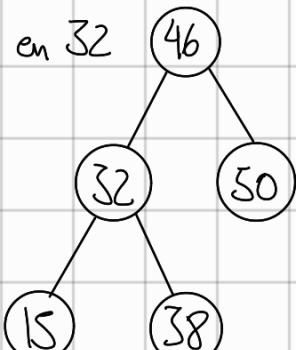
32

-2

35

Rotación DI en 32

DD



Insertar: 23

1

38

1

32

-1

15

0

35

0

50

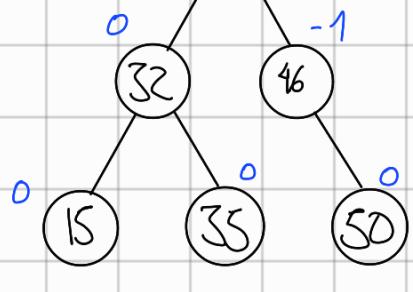
0

46

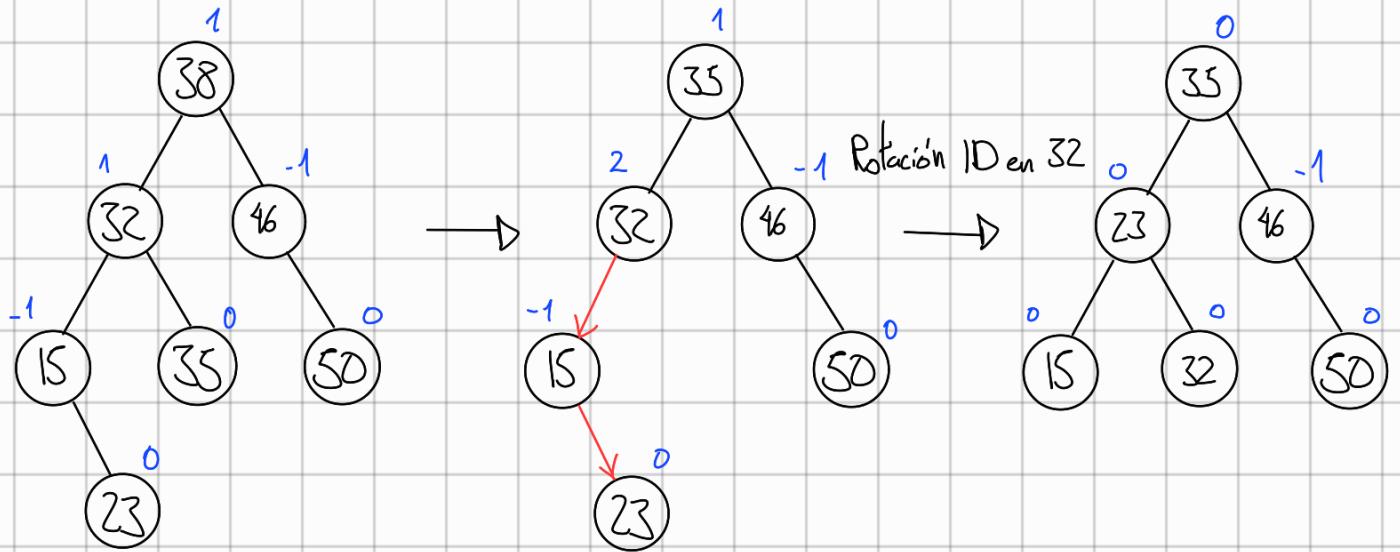
0

23

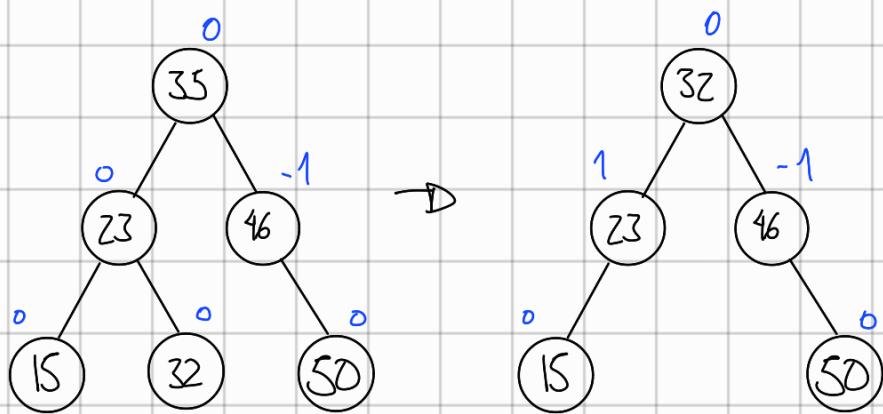
II



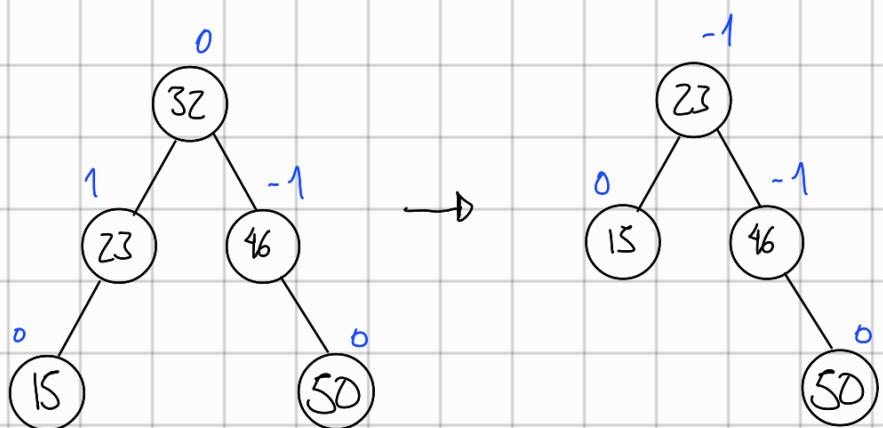
Eliminar: 38



Eliminar: 35



Eliminar: 32

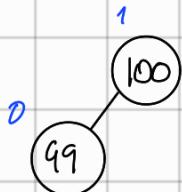


4: En un árbol AVL, inserta los siguientes valores (por este orden) 100, 99, 98, 97, 96, 95, 99, 150 y luego elimina 95, 97, 99.

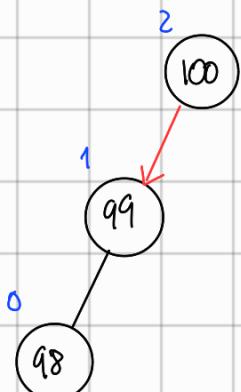
Inserir: 100

100

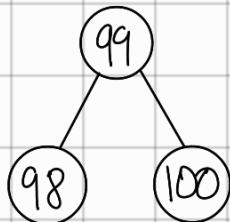
Inserir: 99



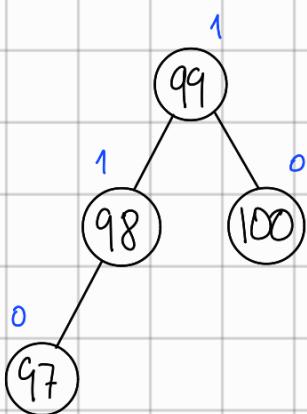
Inserir: 98



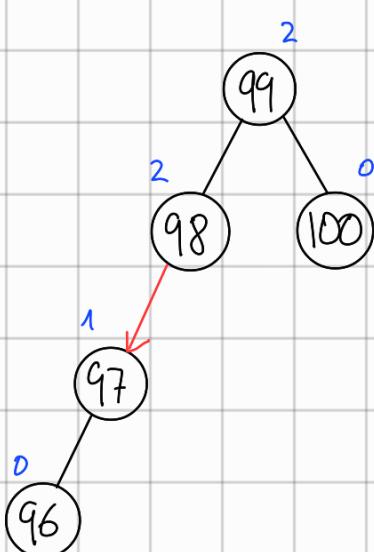
II en 100



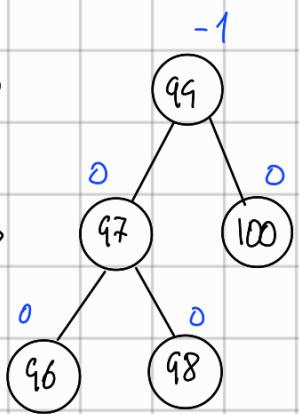
Inserir: 97



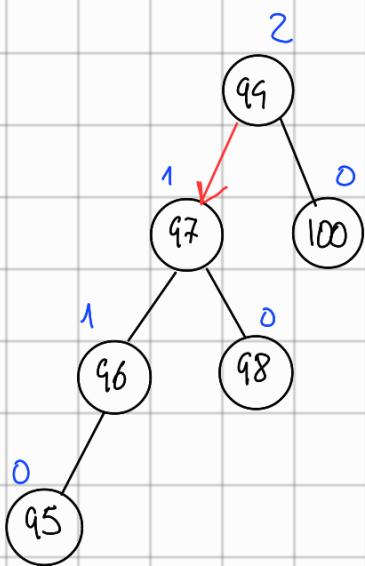
Inserir: 96



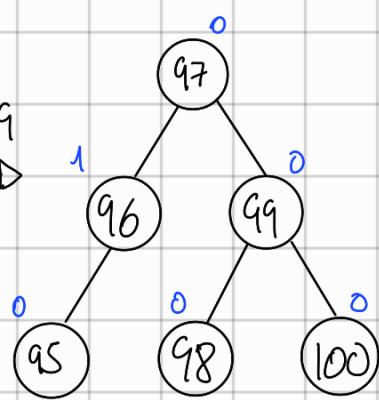
II en 98



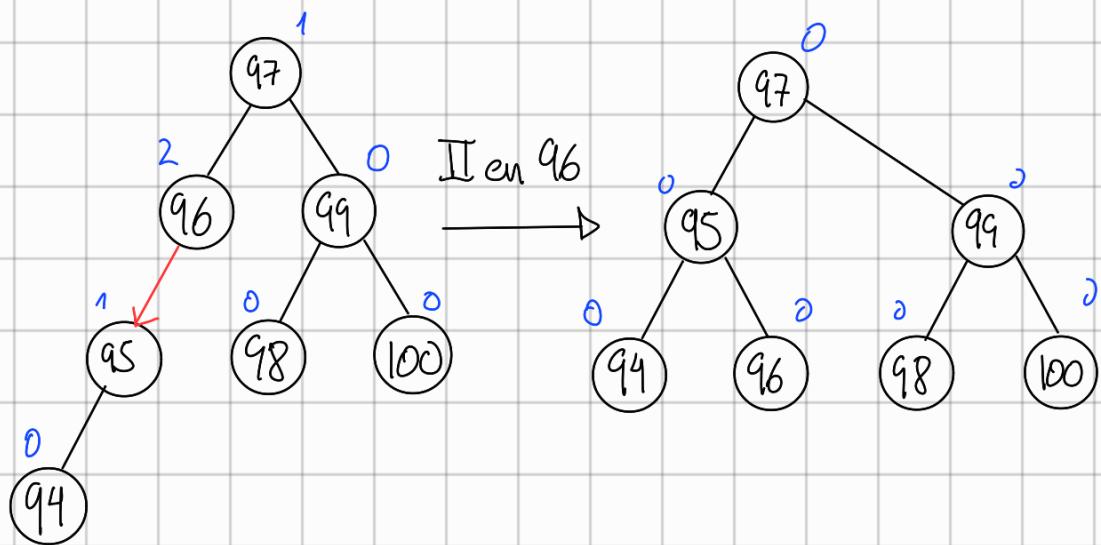
Inserir: 95



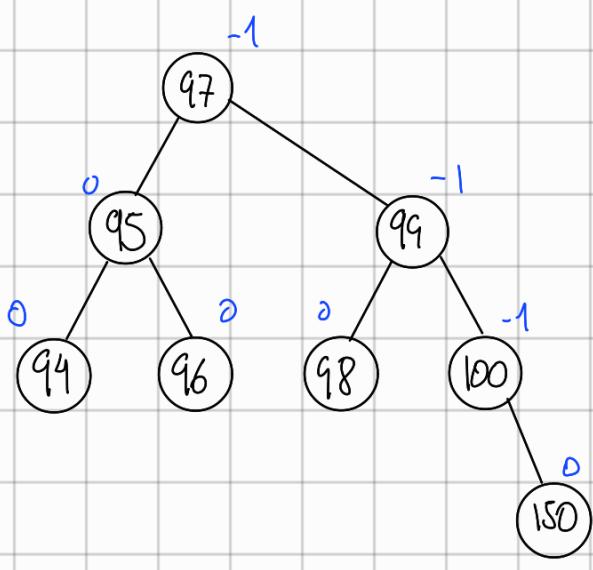
II en 99



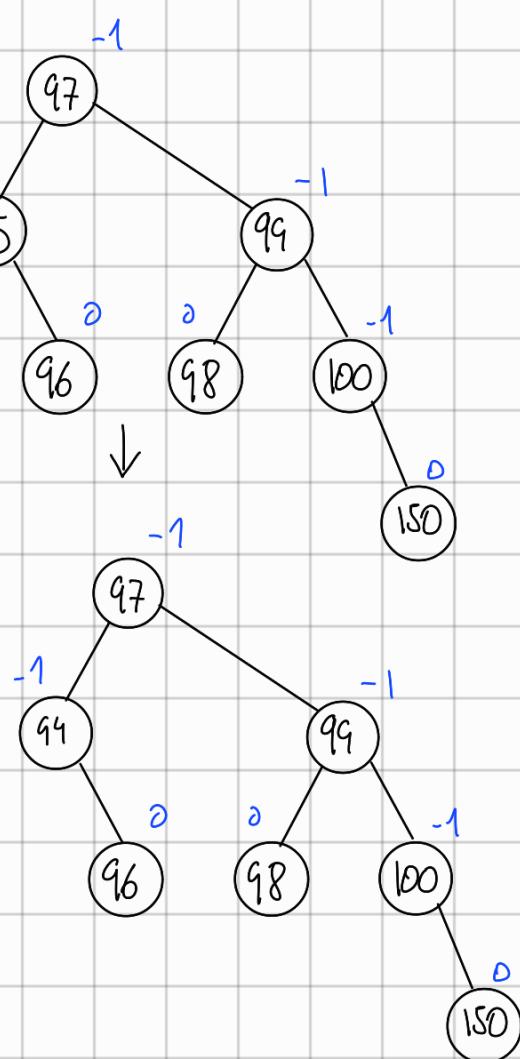
Insertar: 94



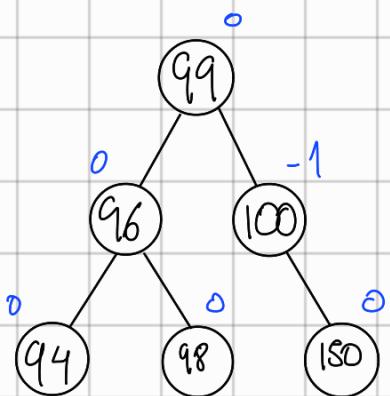
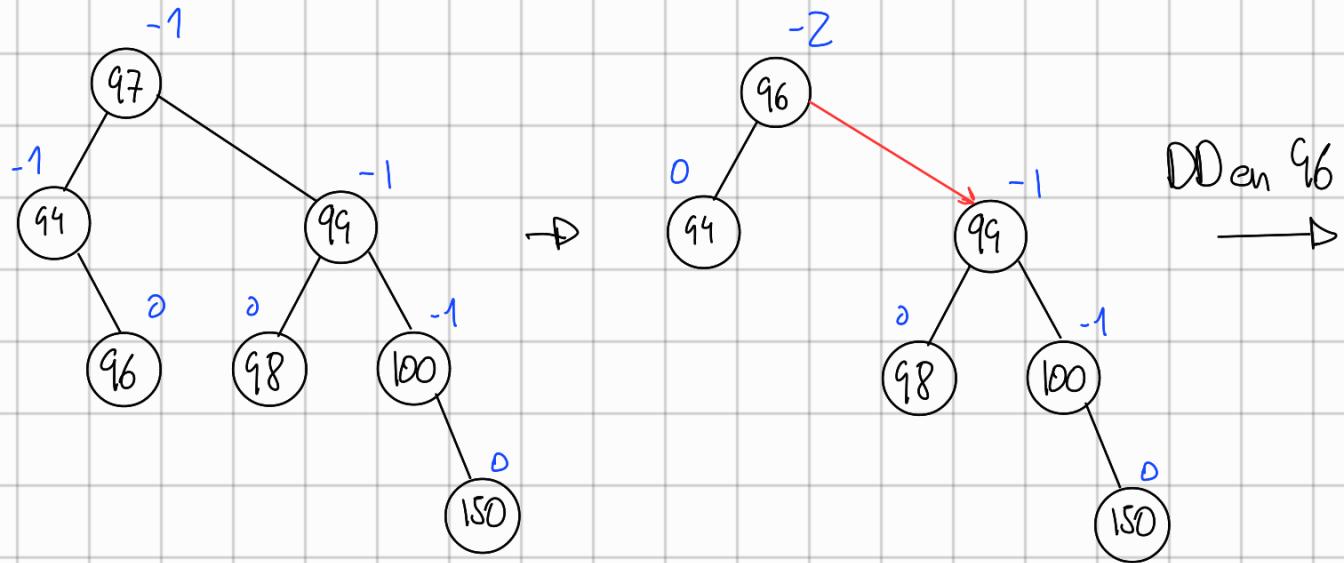
Insertar: 150



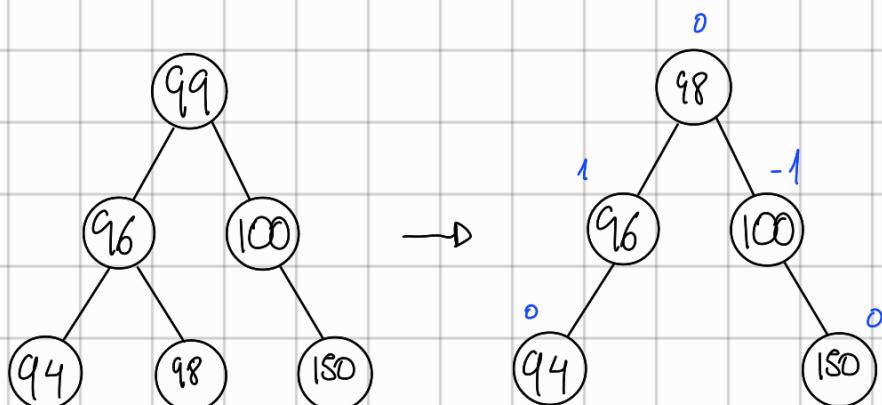
Eliminar: 95



Eliminar: 97



Eliminar: 99

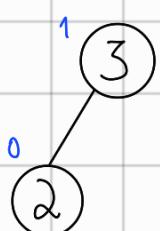


5: En un árbol AVL, inserta los siguientes valores (por este orden): 3, 2, 18, 5, 20, 90, 77, 40, 34, 12 y posteriormente, tres veces el mayor número del árbol.

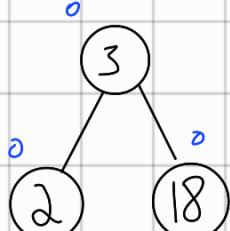
Insertar: 3



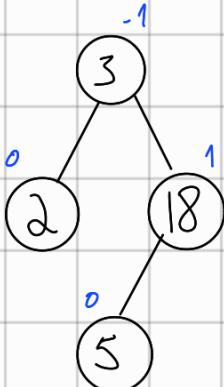
Insertar: 2



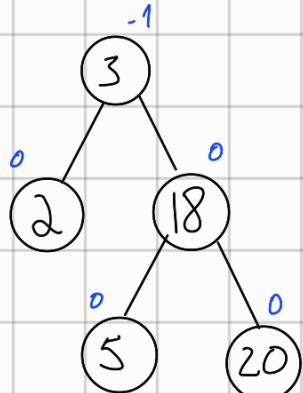
Insertar: 18



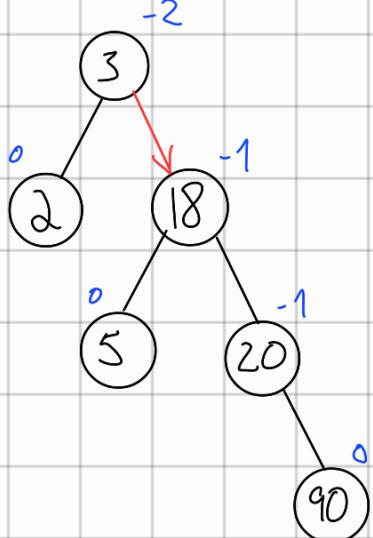
Insertar: 5



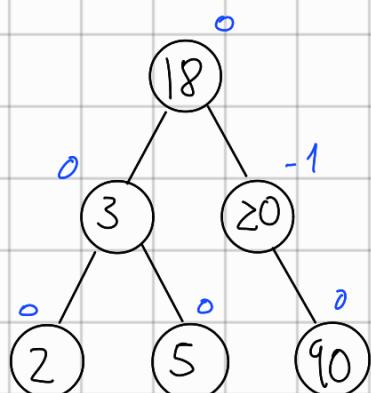
Insertar: 20



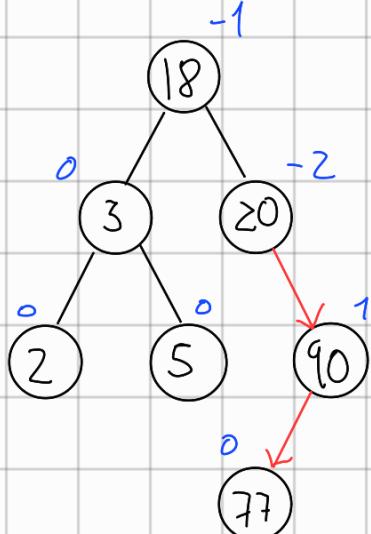
Insertar: 90



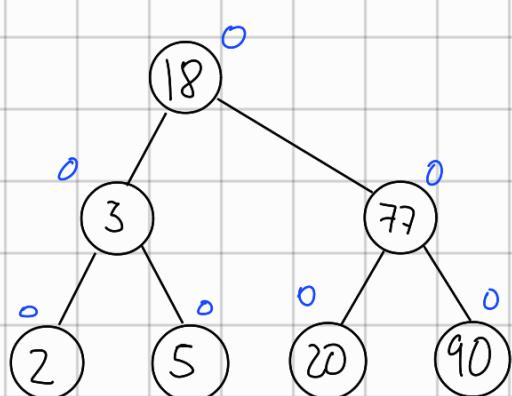
DD en 3



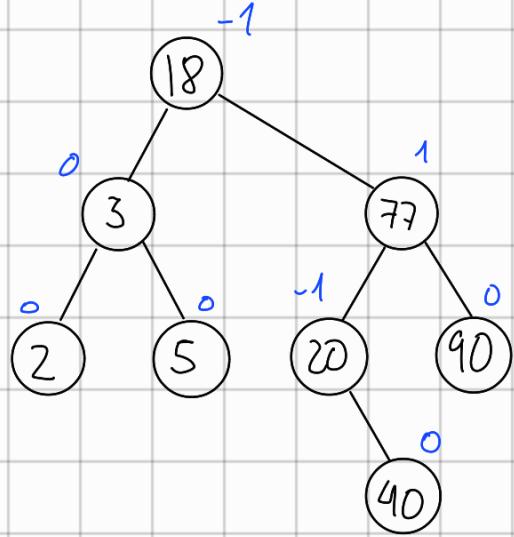
Insertar: 77



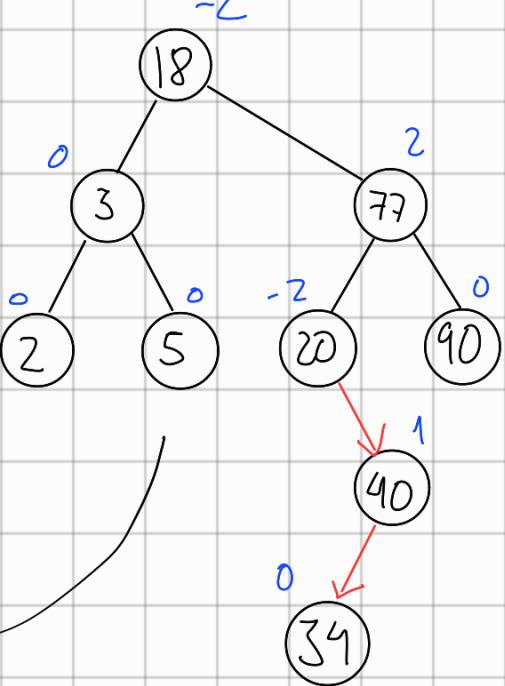
DI en 20



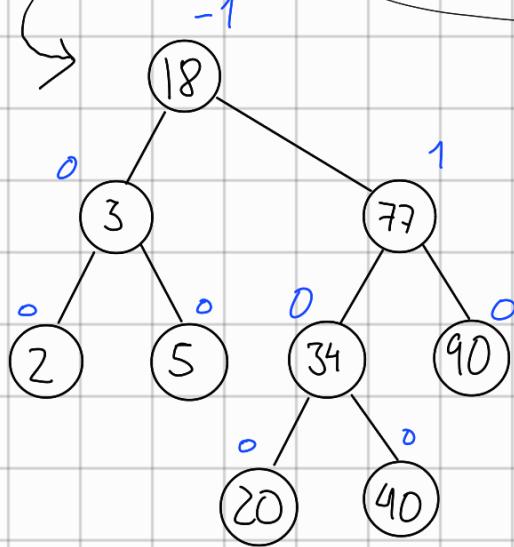
Insertar: 40



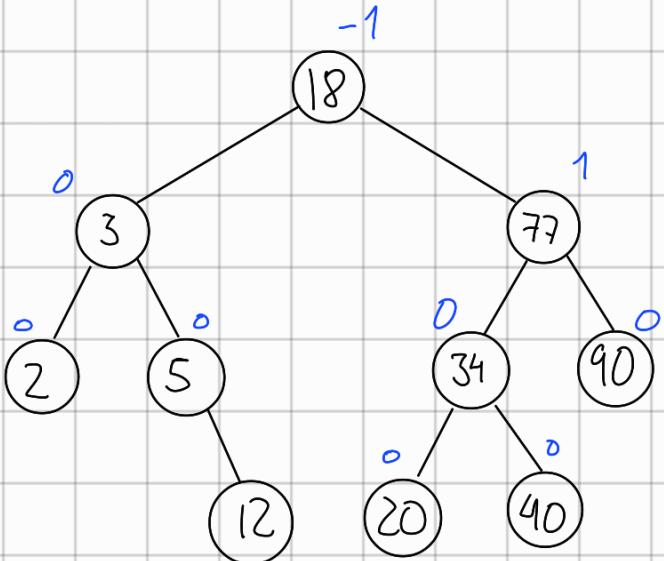
Insertar: 34



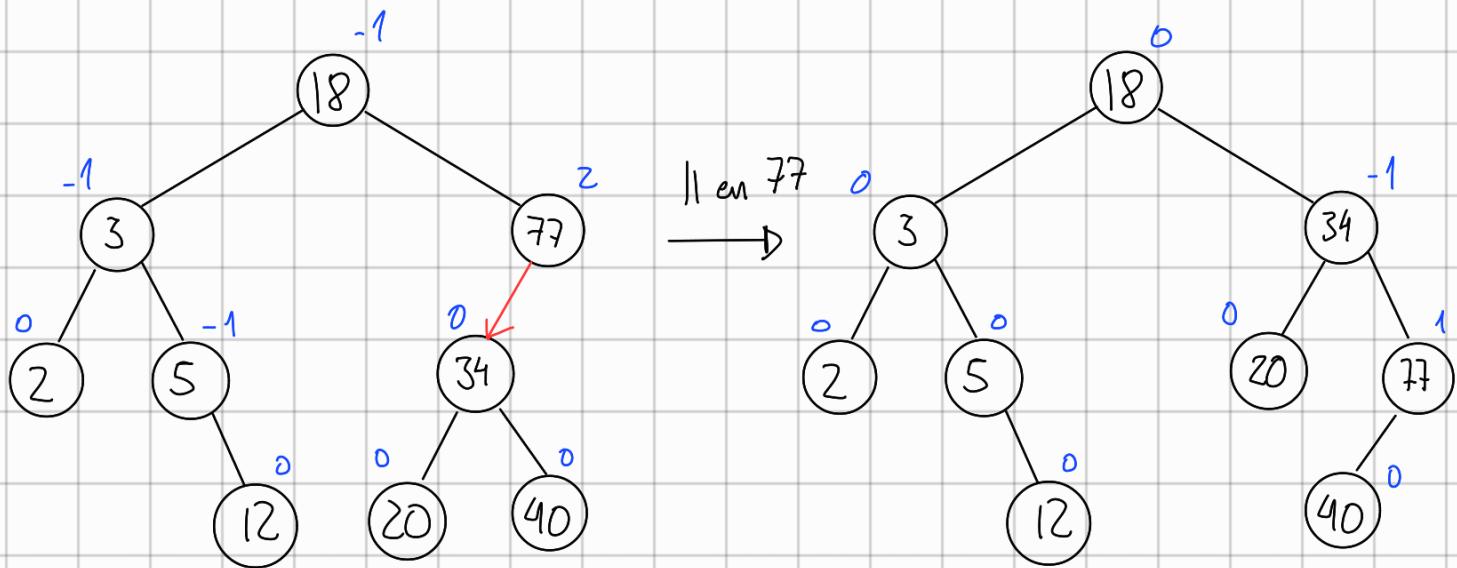
DL en 20



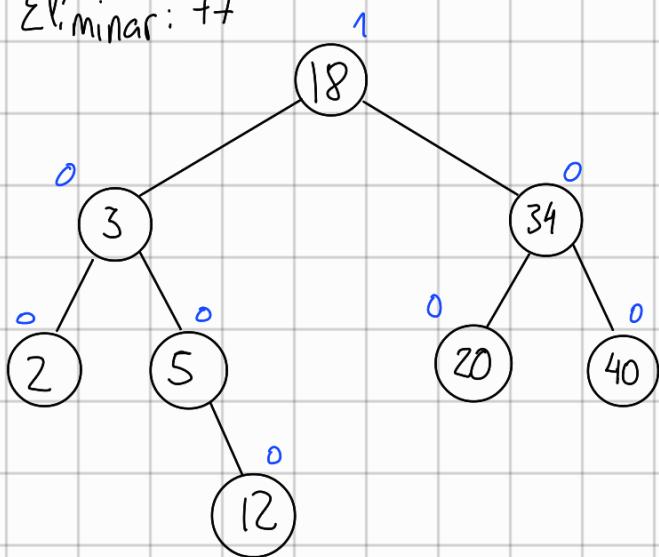
Insertar: 12



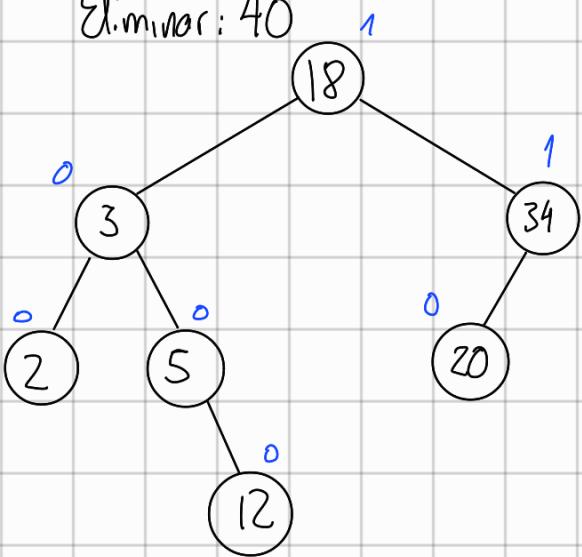
Eliminar: 90



Eliminar: 77



Eliminar: 40

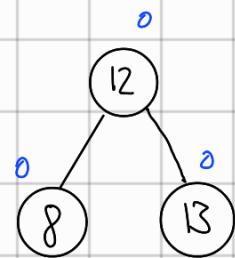
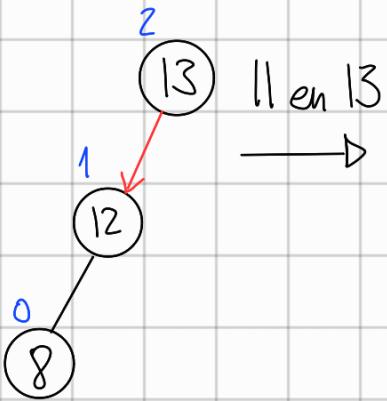


6: En un árbol AVL, inserta los siguientes valores (por este orden): 13, 12, 8, 28, 15, 30, 80, 67, 42, 31, 21 y posteriormente, tres veces el mayor número del árbol.

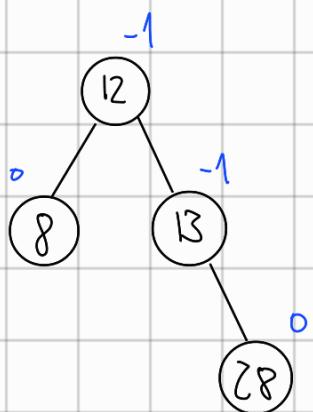
Insertar: 13

Insertar: 12

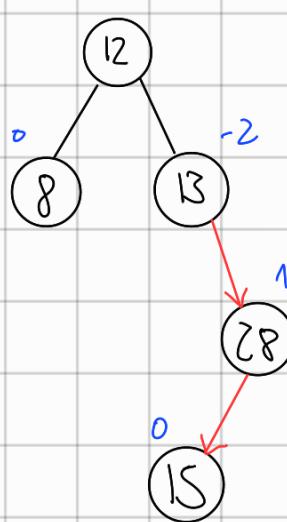
Insertar: 8



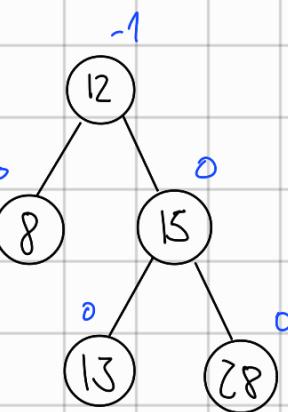
Insertar: 28



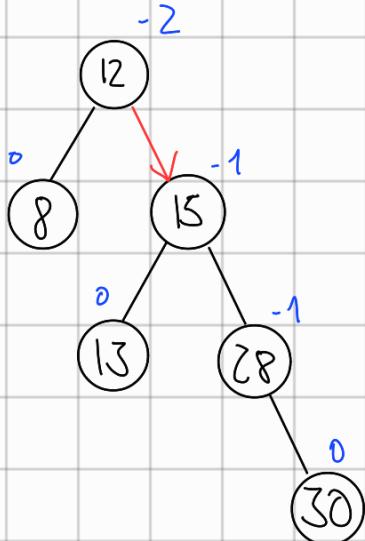
Insertar: 15



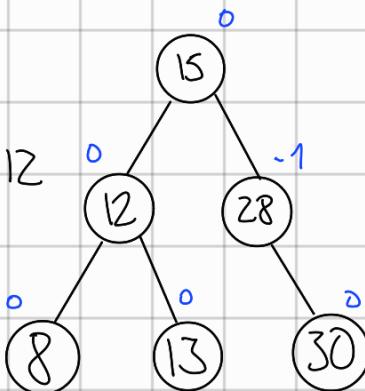
D1



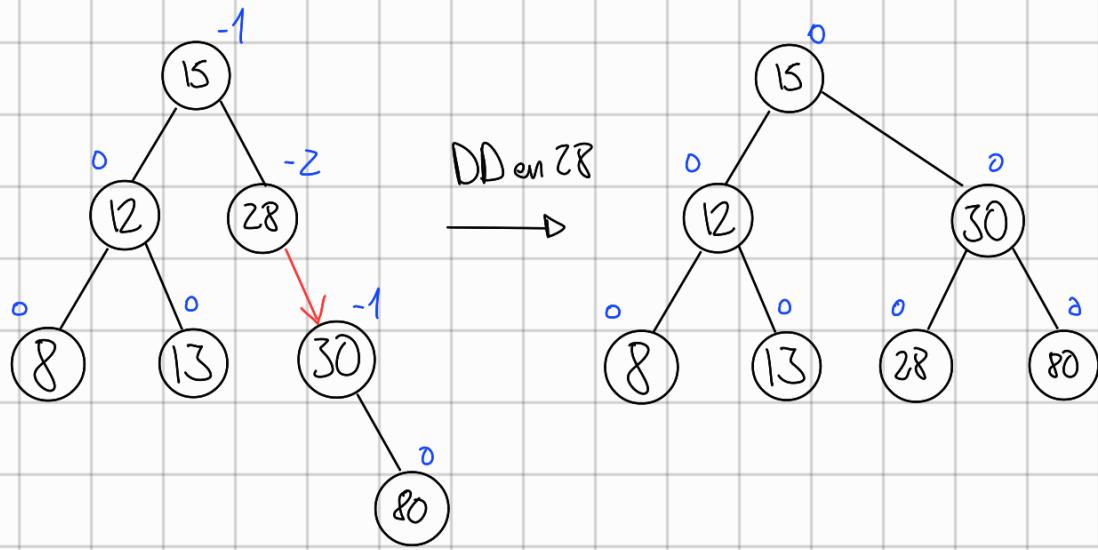
Insertar: 30



DD en 12

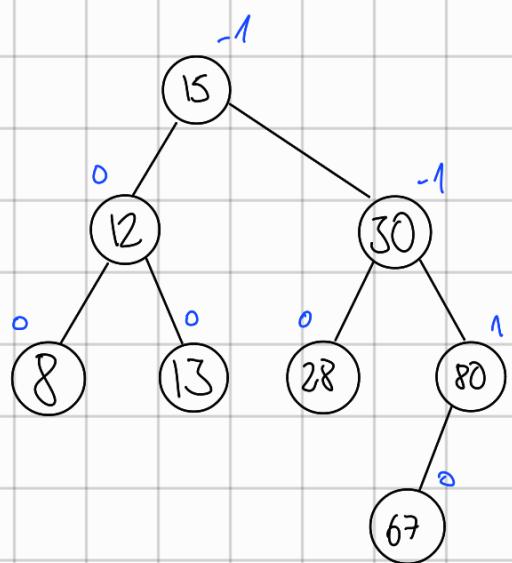


Inserir: 80

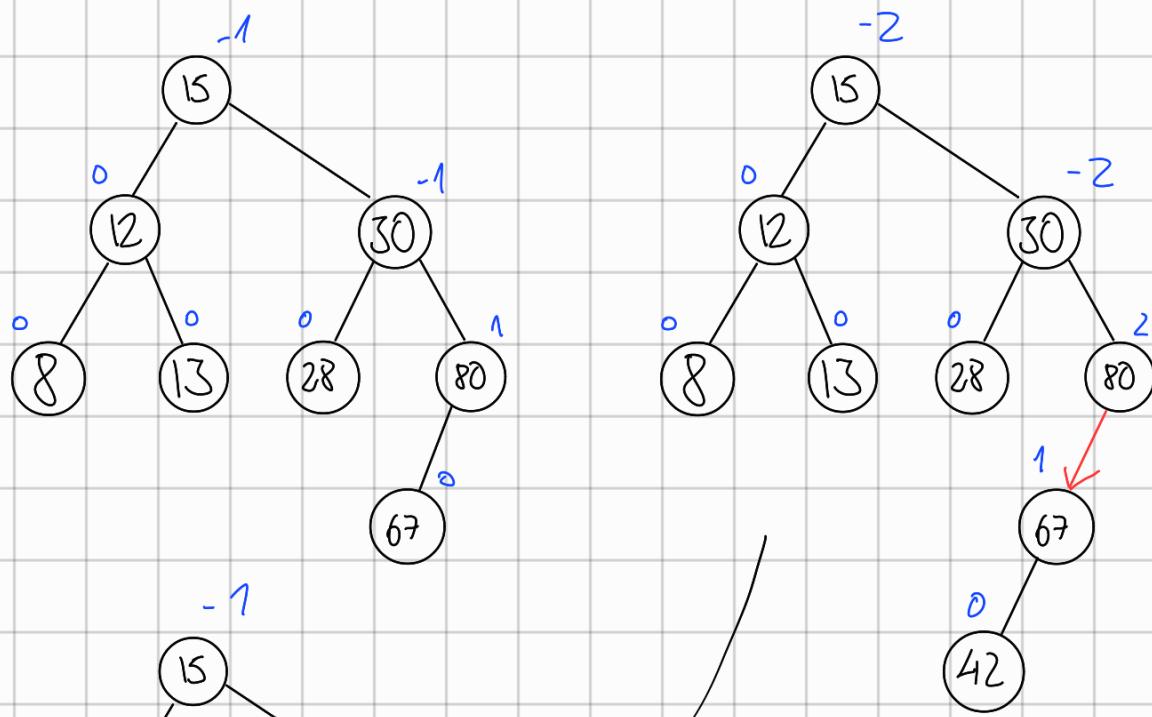


DD en 28
→

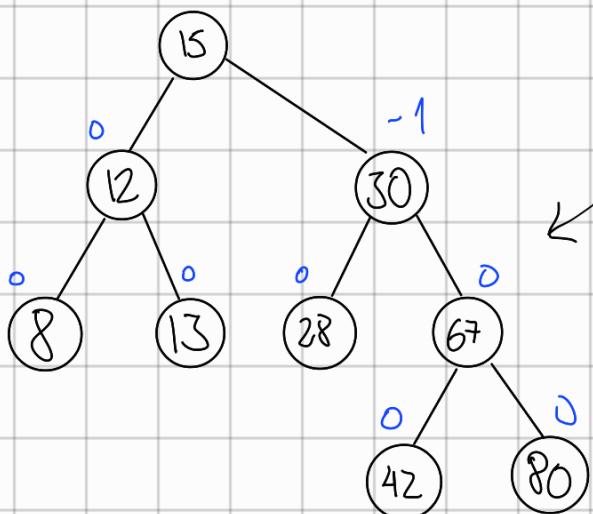
Inserir: 67



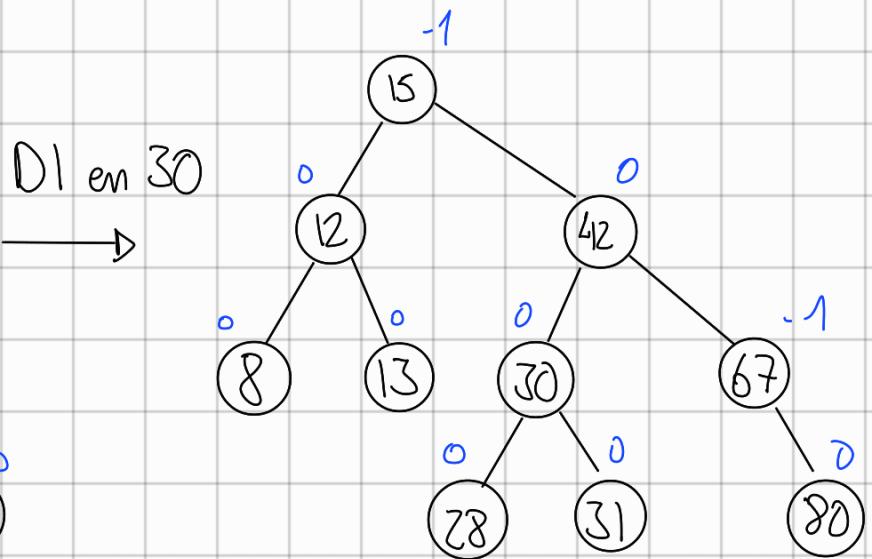
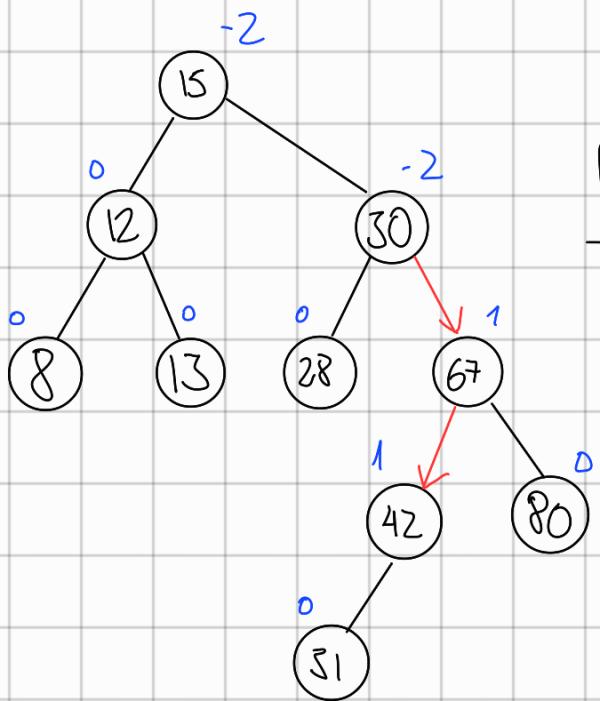
Inserir: 42



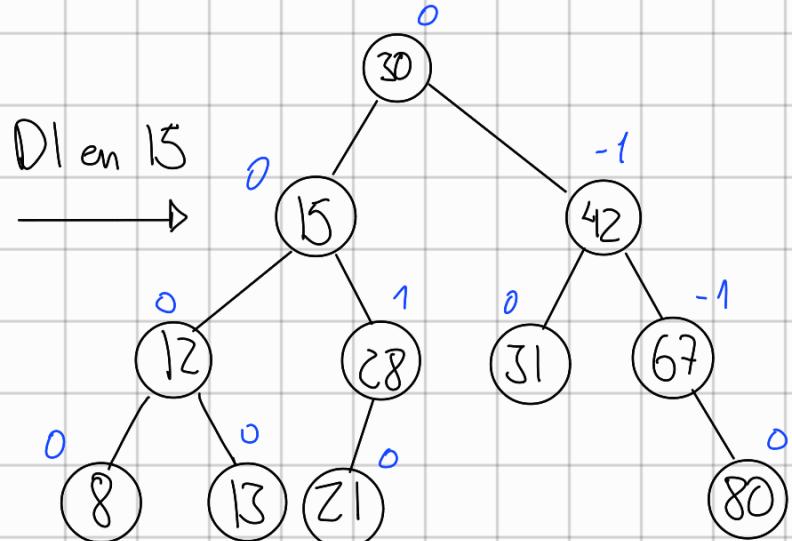
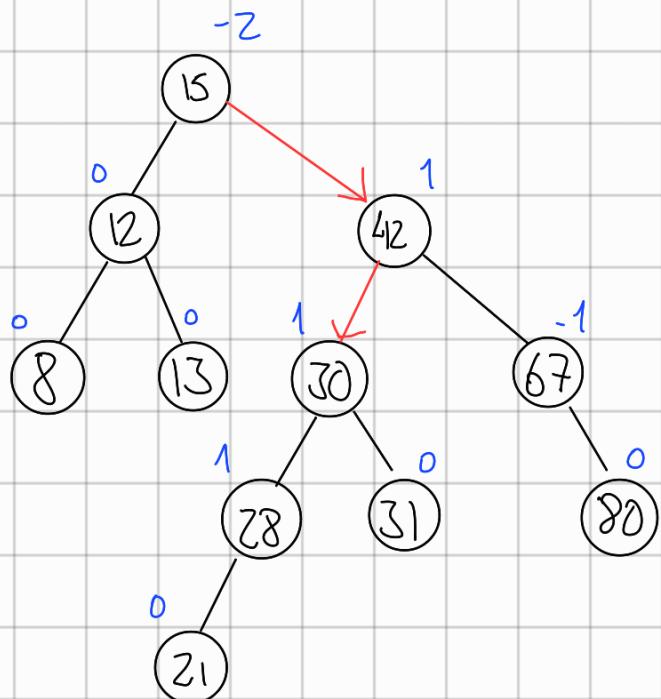
II en 80



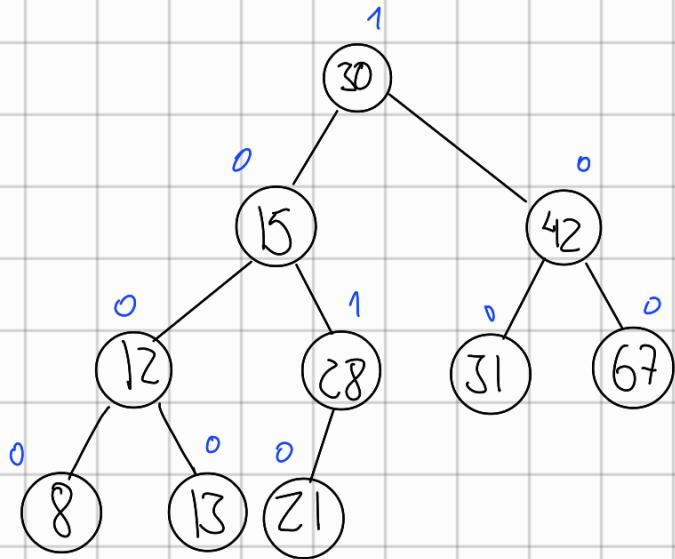
Inserción: 31



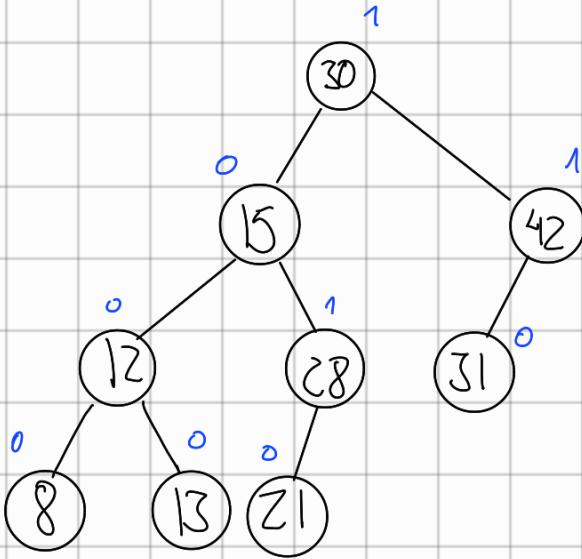
Inserción: 21



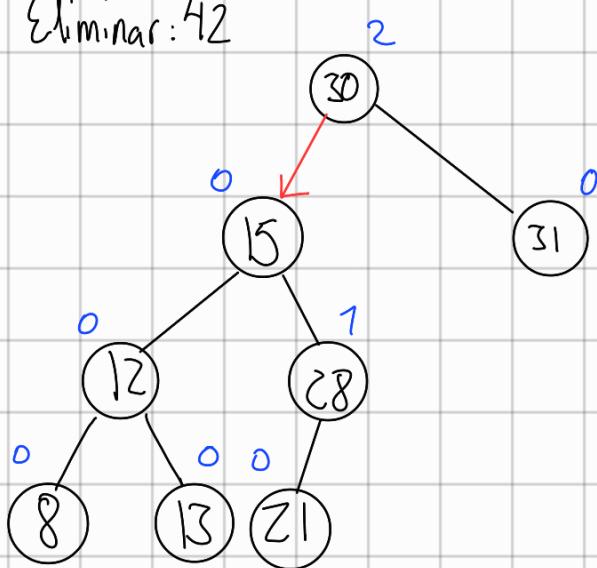
Eliminar: 80



Eliminar: 67



Eliminar: 42



11 en 30

