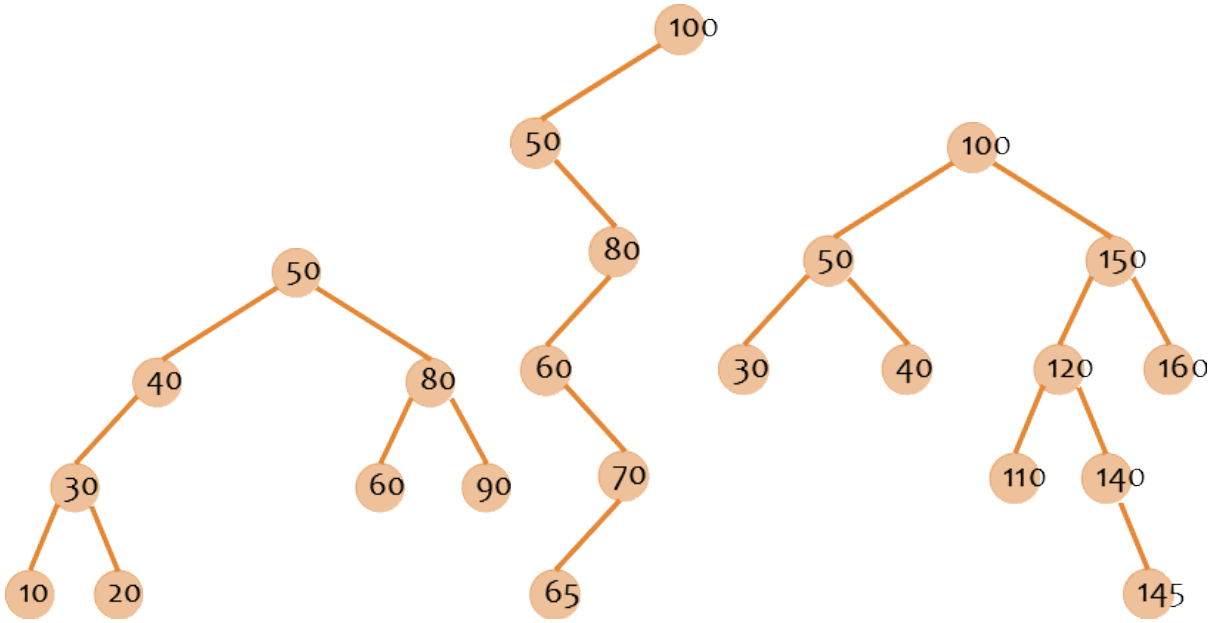
ALGORITMOS Y ESTRUCTURAS DE DATOS
2° Grado en Ingeniería Informática
Ejercicios Árboles (iii): AVL

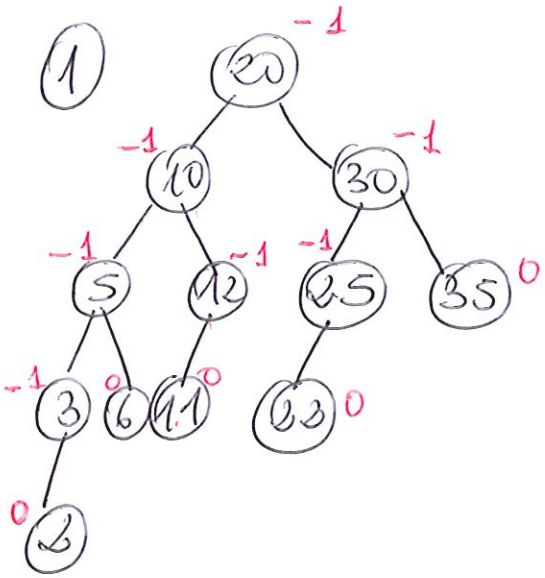
1. Dada la secuencia de claves enteras 20, 10, 30, 5, 25, 12, 3, 35, 22, 11, 6, 2. Representa gráficamente el árbol AVL correspondiente e indica en qué momento se efectuó una rotación.
2. Dada la secuencia de claves enteras: 100, 29, 71, 82, 48, 39, 101, 22, 46, 17, 3, 20, 25, 10. Representa gráficamente el árbol AVL correspondiente.
3. Determina cuáles de los siguientes árboles binarios de búsqueda son AVL. En el caso de que no lo sean, encuentra todos los nodos que violen los requerimientos de AVL.



4. Inserta las claves en el orden indicado a fin de incorporarlas a un árbol AVL.
   a) 10, 100, 20, 80, 40, 70
   b) 5, 10, 20, 30, 40, 50, 60
   c) 50, 100, 40, 5, 110, 20, 60, 65
   d) 10, 100, 20, 90, 30, 80, 40, 70, 50, 60
   e) 100, 90, 80, 70, 60, 50, 40, 30, 20, 10

5. Elimina las claves de los árboles construidos en el ejercicio anterior en el orden primero en entrar, primero en salir.

1

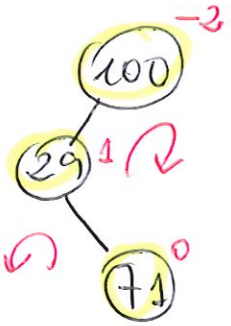


NO HAY ROTACIONES

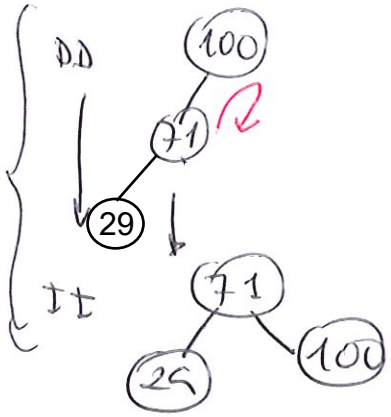
EL ARBOL ESTA EQUILIBRADO

2

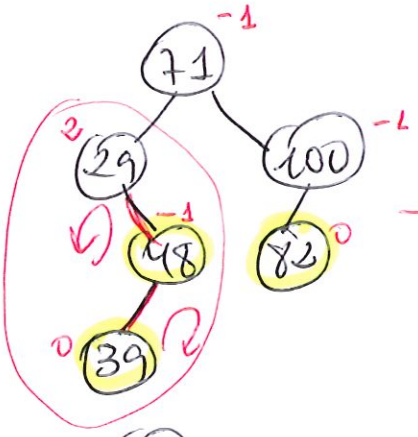
100, 29, 71 →



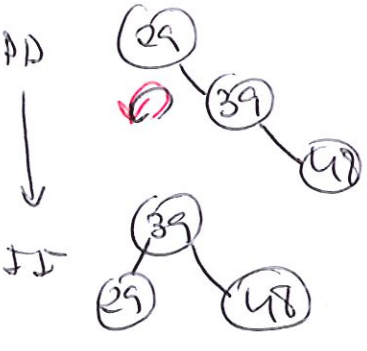
ID →



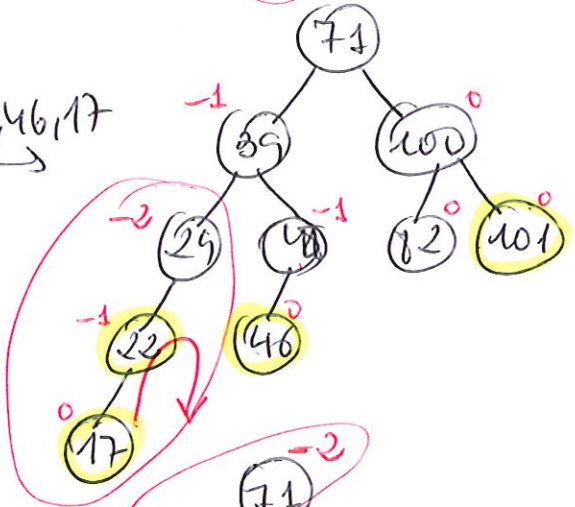
82, 48, 39 →



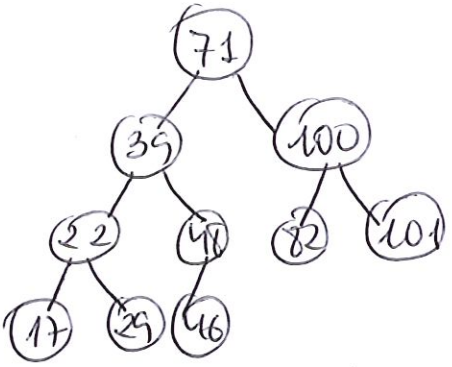
DI →



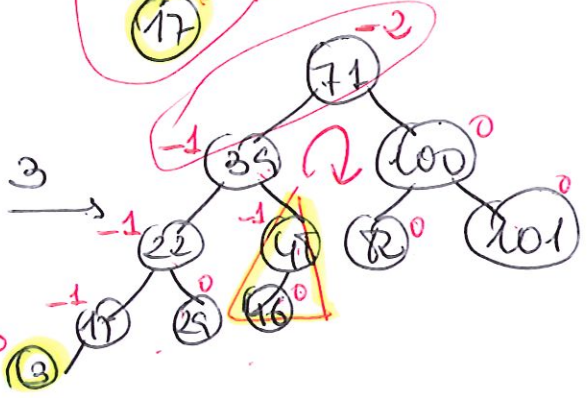
101, 22, 46, 17 →



II →

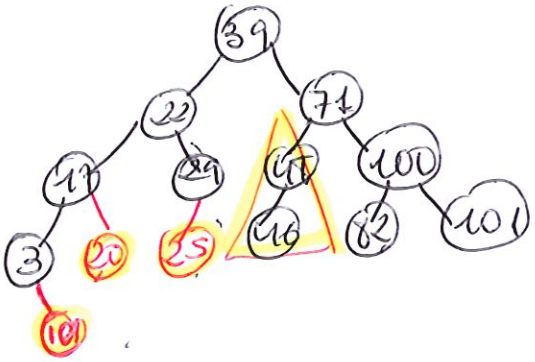


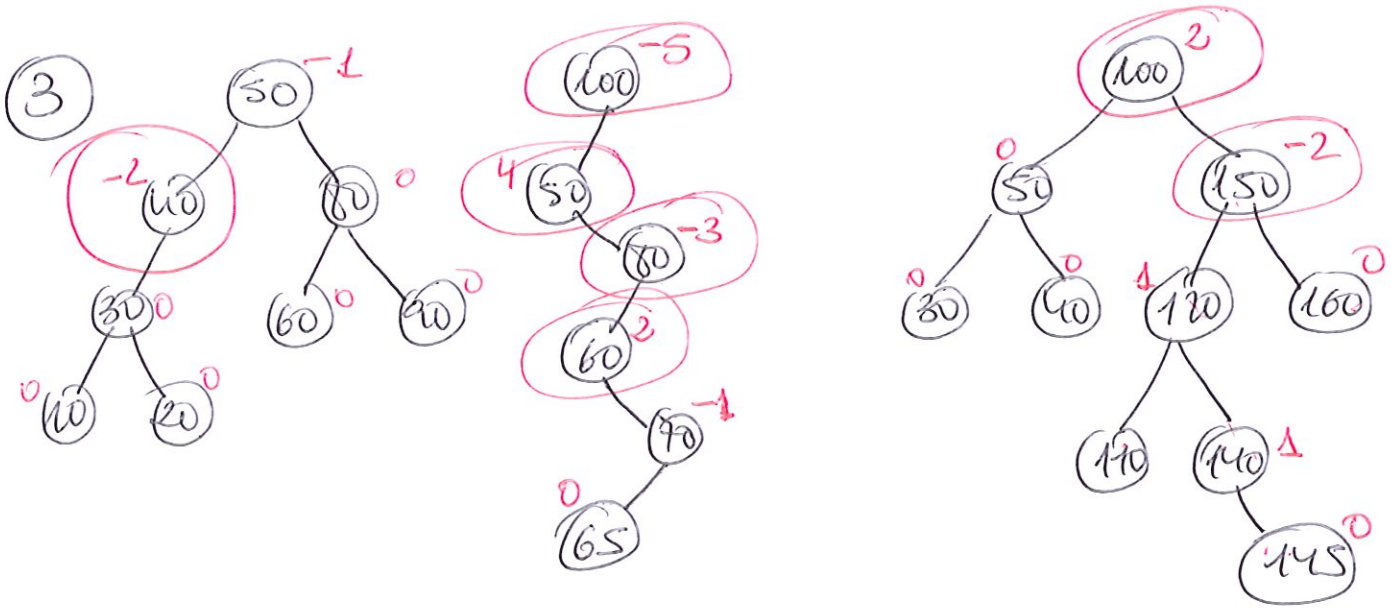
3 →



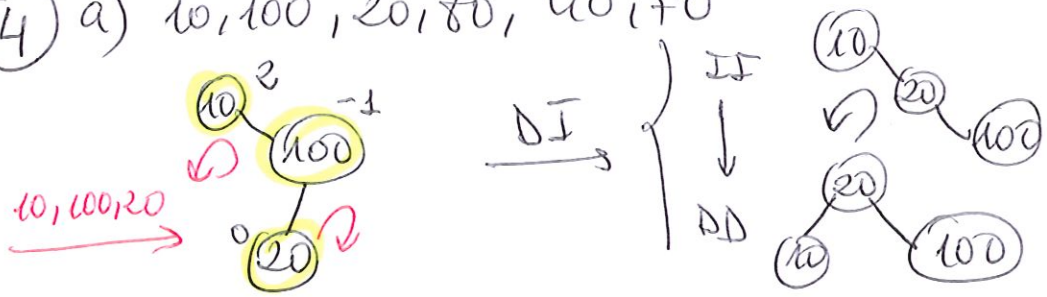
II →

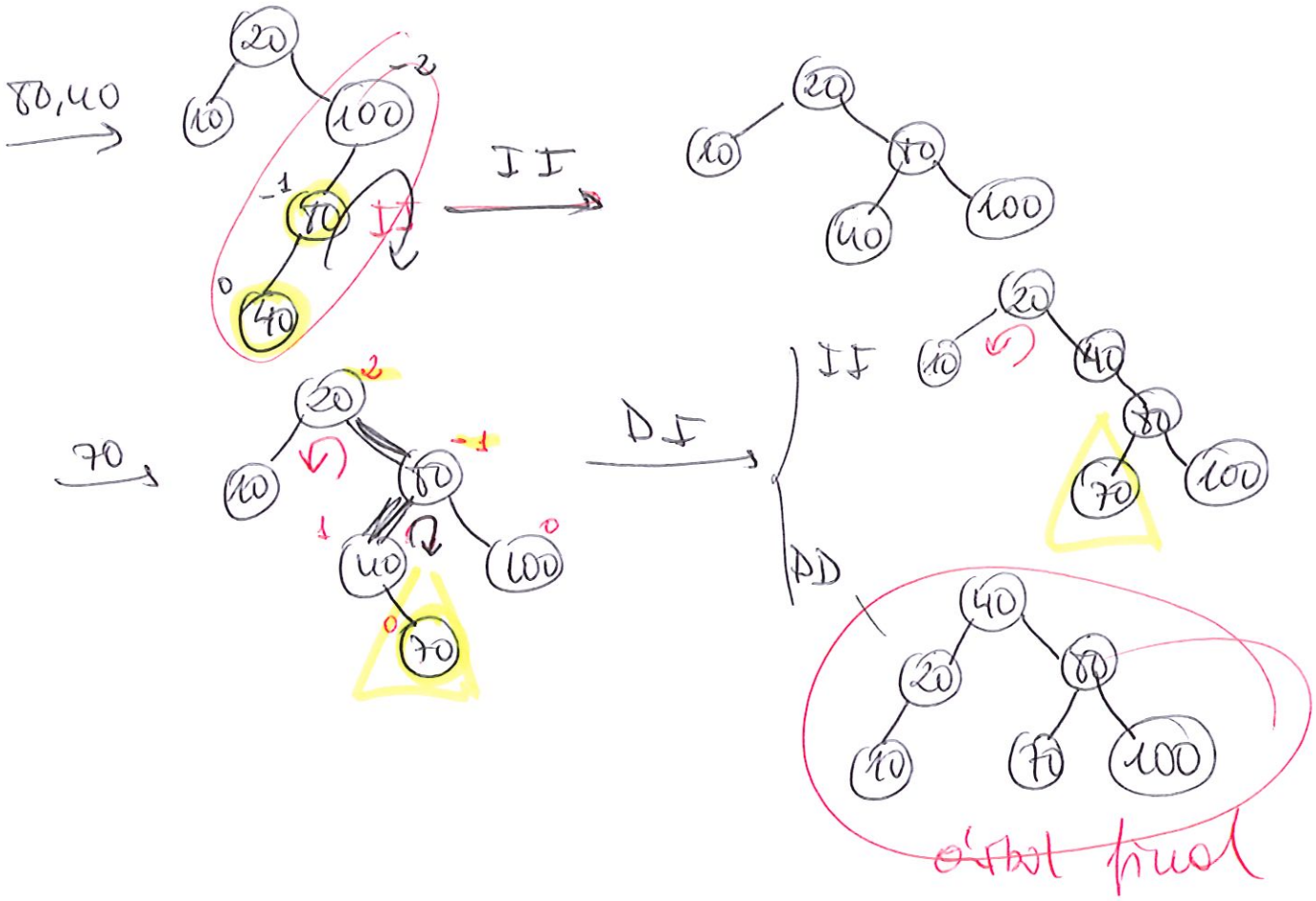
20, 25, 10 →





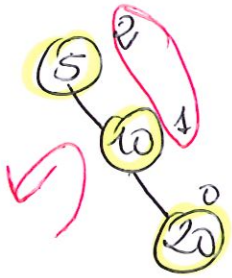
(4) a) 10, 100, 20, 80, 40, 70



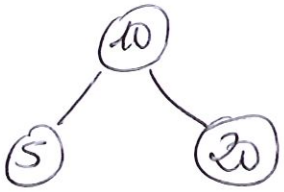


4b) 5, 10, 20, 30, 40, 50, 60

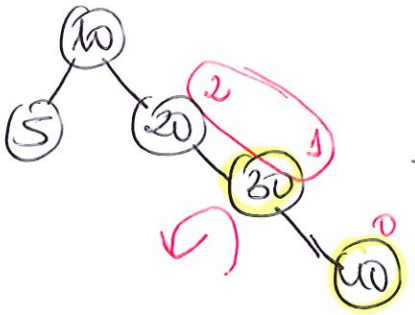
5, 10, 20 →



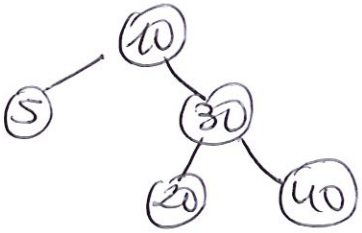
DD →



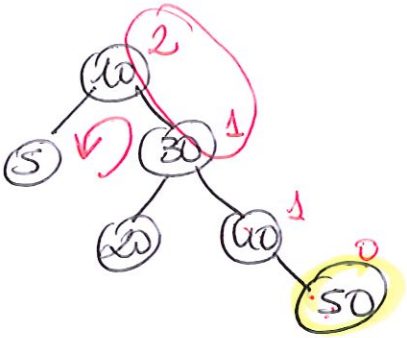
30, 40 →



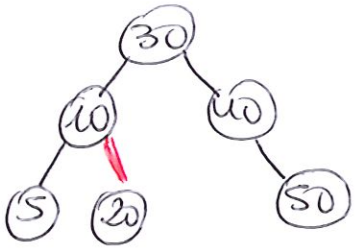
DD →



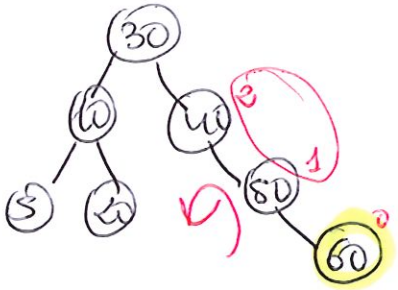
50 →



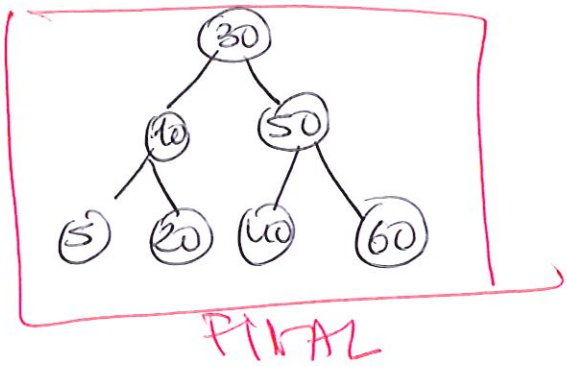
DD →



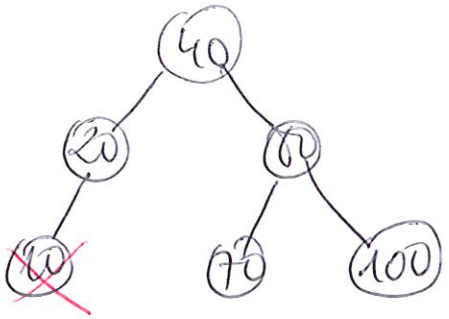
60 →



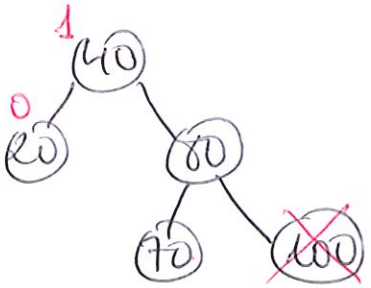
DD →



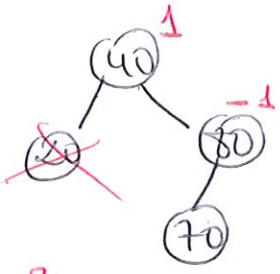
5a



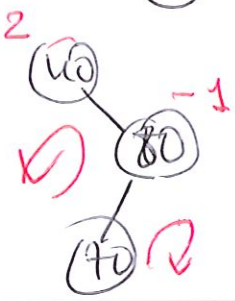
Elimino 10 (hoja) →



Elimino 100 (hoja) →

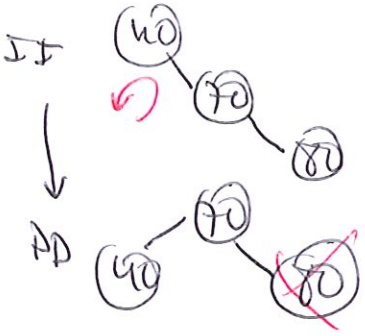


Elimino 20 (hoja) →

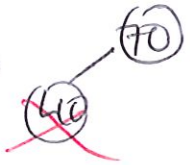


Fe=2 → subárbol hijo dcho → Fe (hijo dcho) 2Q

↳ DI →



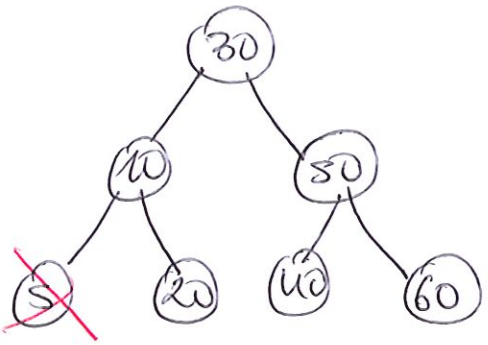
Elimino 80 (hoja) →



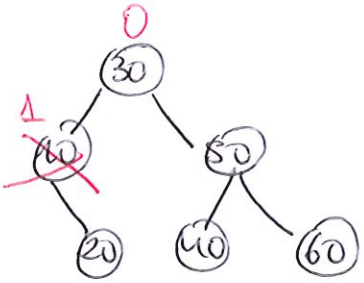
Elimino 40 (hoja) →

Elimino 70 (hoja) → árbol vacío

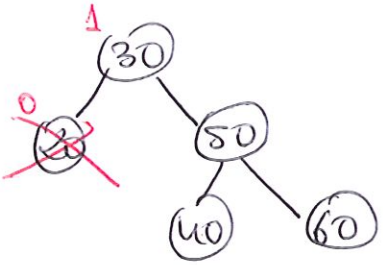
5b



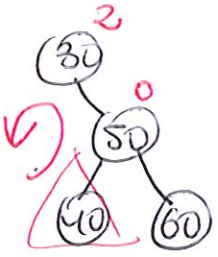
Elimino 5 (hoja) →



Elimino 10 (único hijo) →

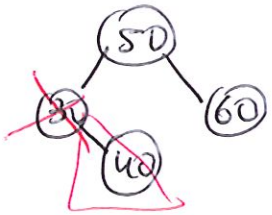


Elimino 20 (hoja) →

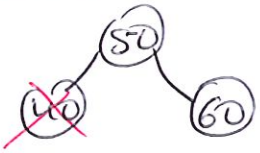


Fe = 2
Fe(HD) ≥ 0 } DD

rotación DD →



Elimino 30 (único hijo) →



Elimino 40 (hoja) →

Elimino 50 (único hijo) → 60

Elimino 60 (hoja) → árbol vacío