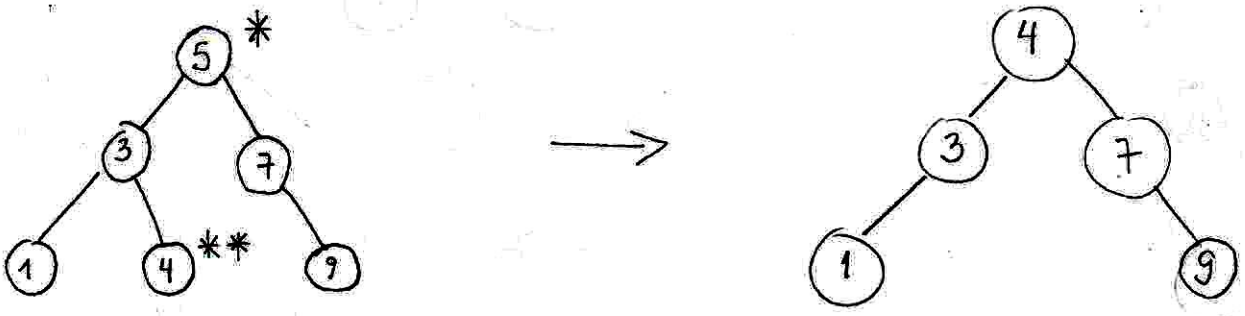
Gabarito - AD2 - 2016/1

(1) Se a remoção for feita numa folha, nada a fazer. Caso contrário, podemos substituir o nó removido pelo nó com chave imediatamente inferior (ou superior).

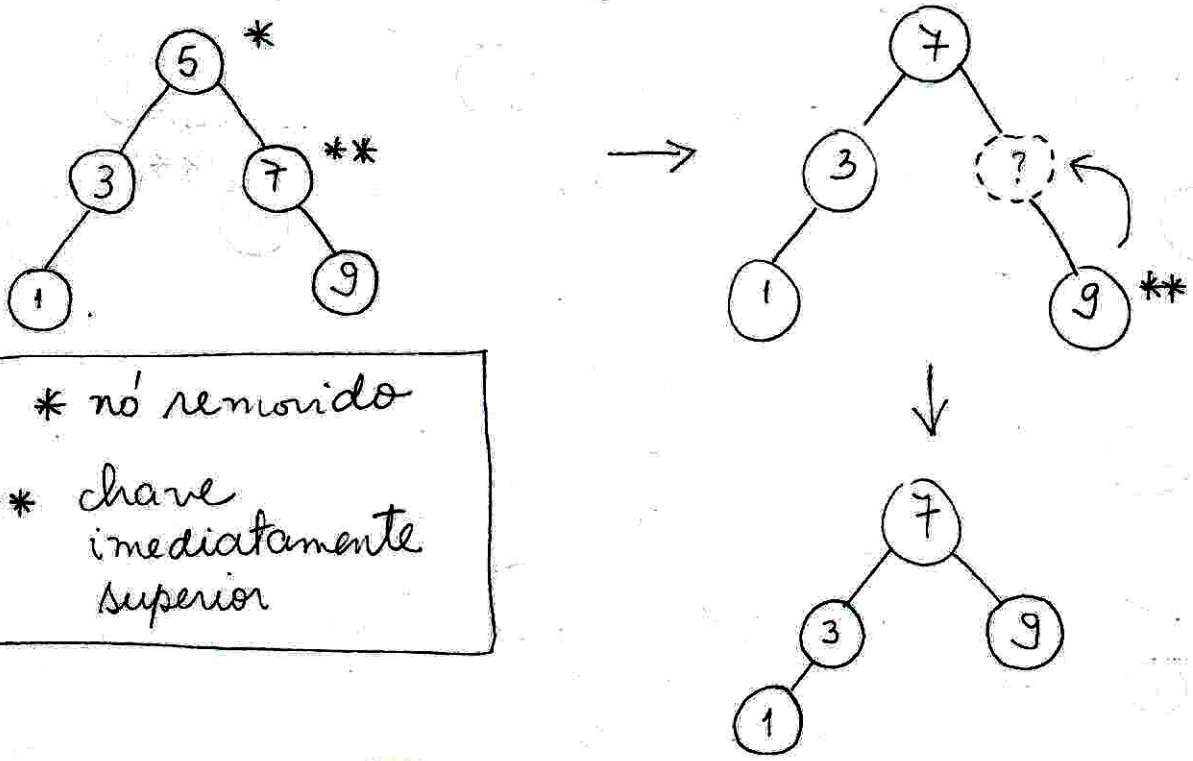
Exemplo:



* nó removido
** chave imediatamente inferior

Se o nó que substituiu o nó removido não for uma folha, o procedimento continua recursivamente.

Exemplo:



* nó removido
** chave imediatamente superior

(2) Falso. As duas árvores binárias abaixo têm o mesmo percurso em nível e o mesmo nº de nós em cada nível.

Percurso em nível: A, B, C, D

nº de nós em cada nível: 1, 2, 1

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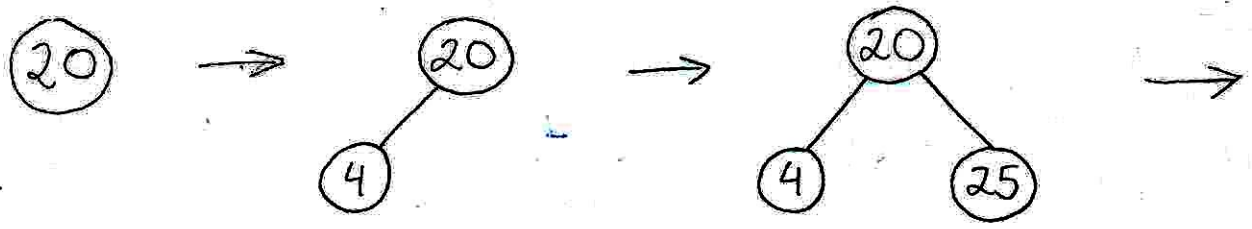
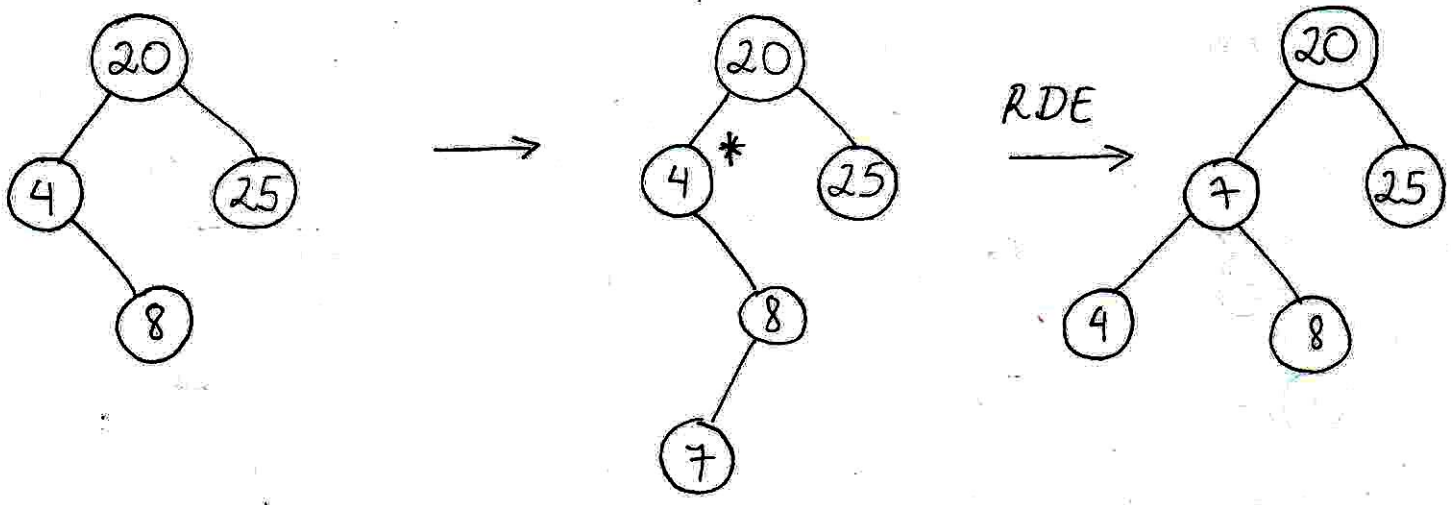
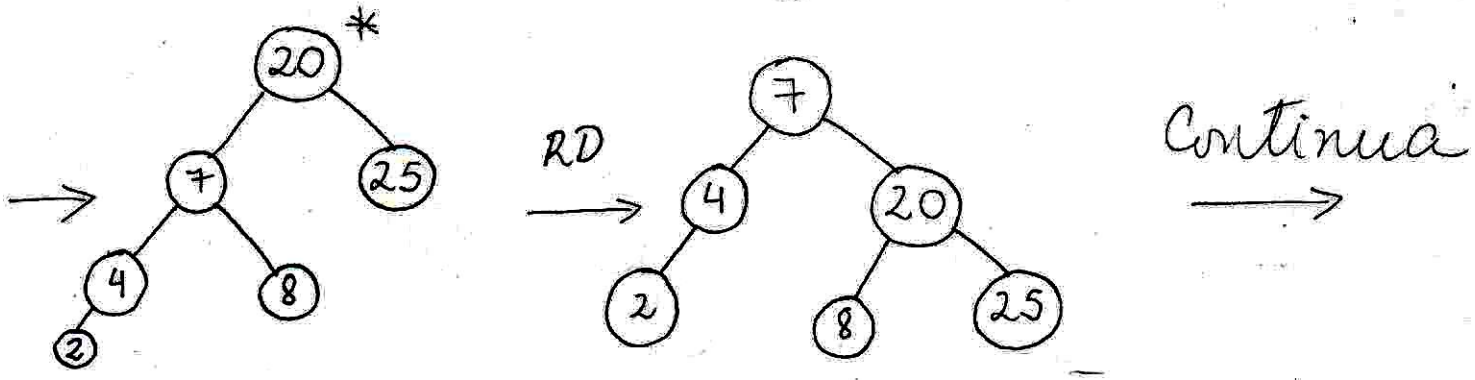
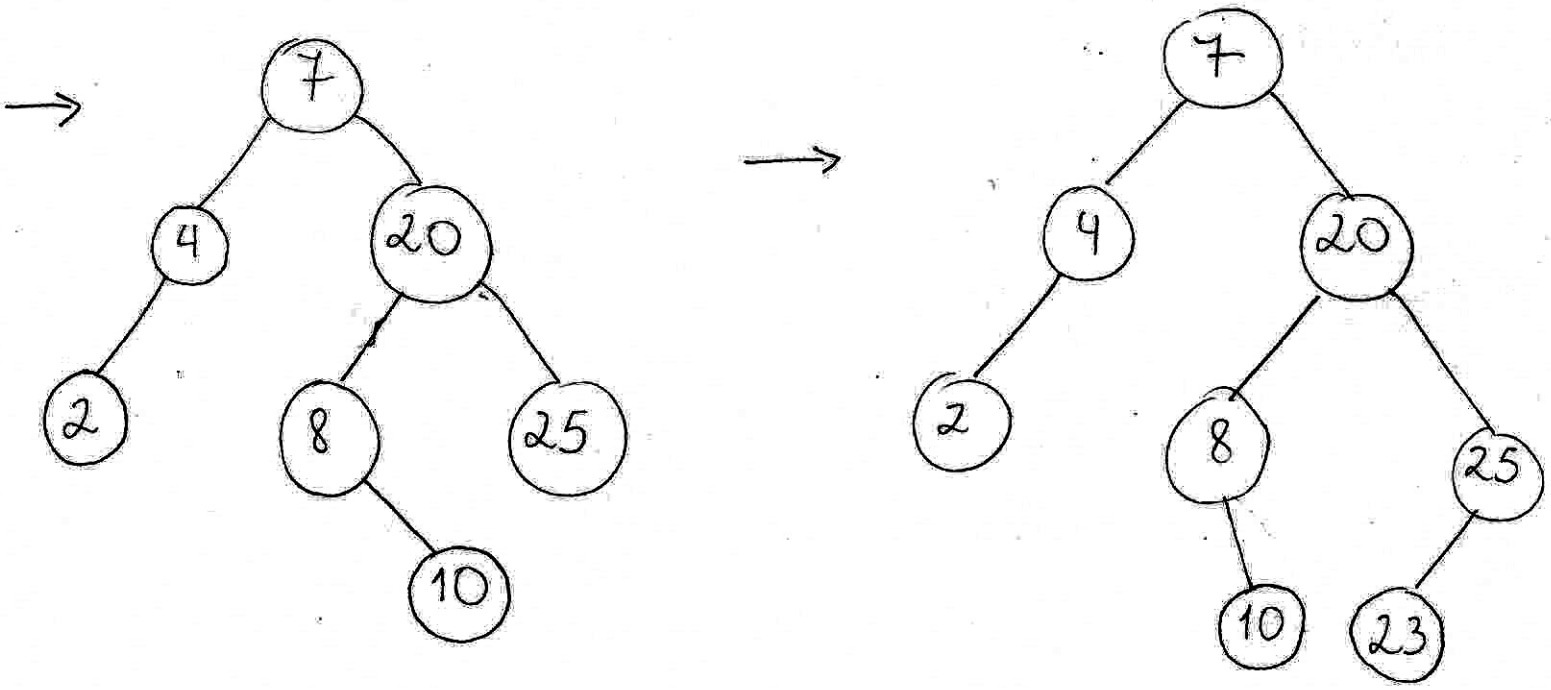
(3) "*" indica nó desequilibrado



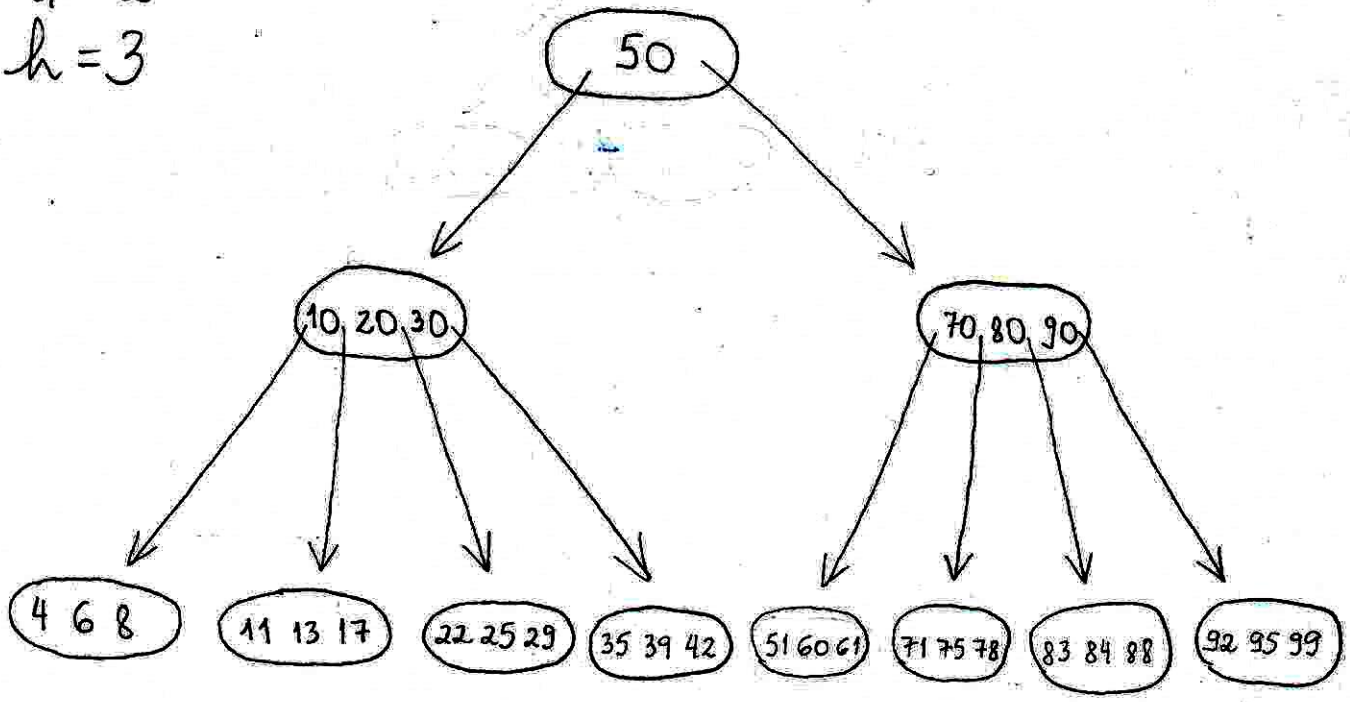




(3) (continuação)

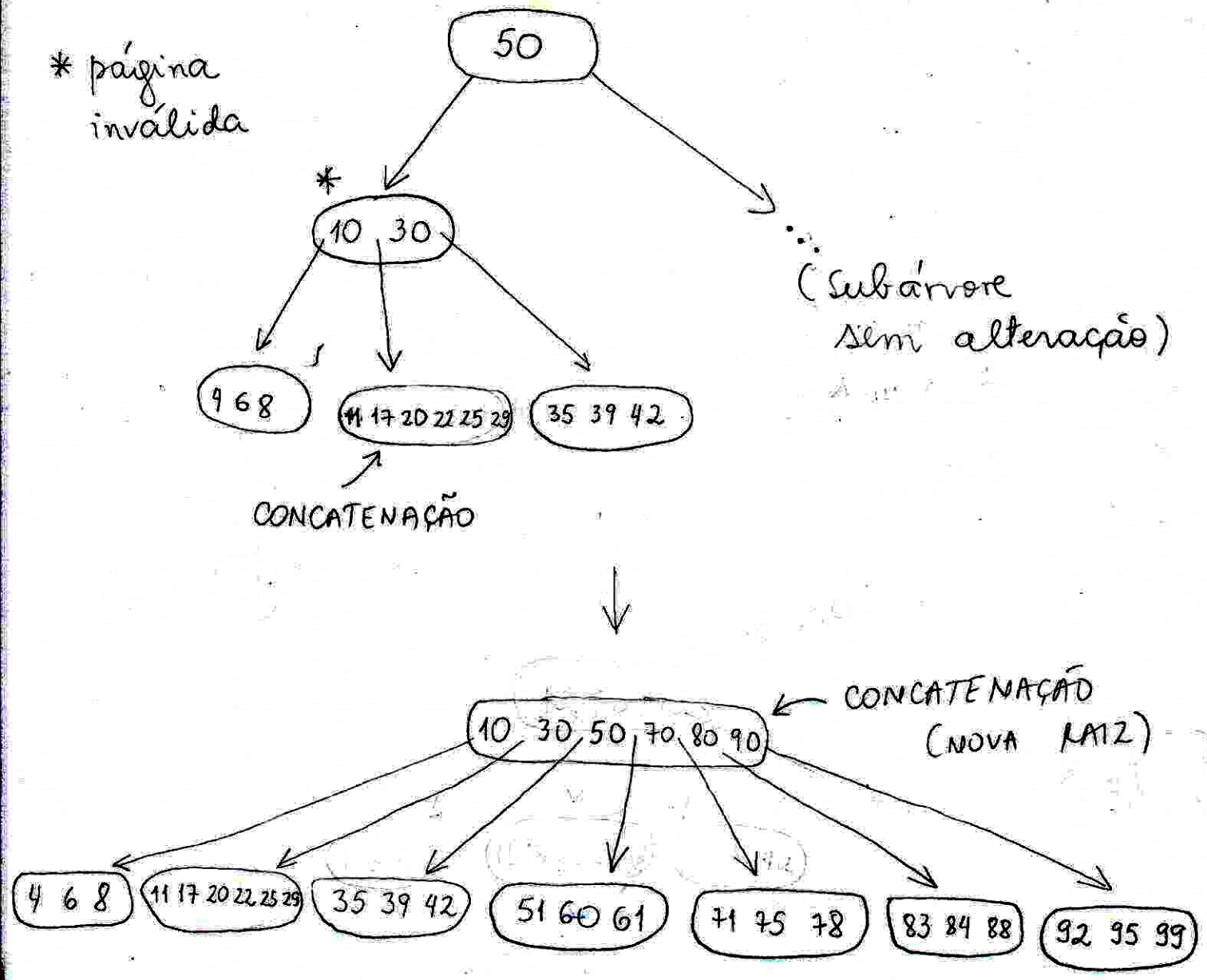


(4) $d = 2$
$h = 3$



Removendo a chave 13, temos:

Continua →



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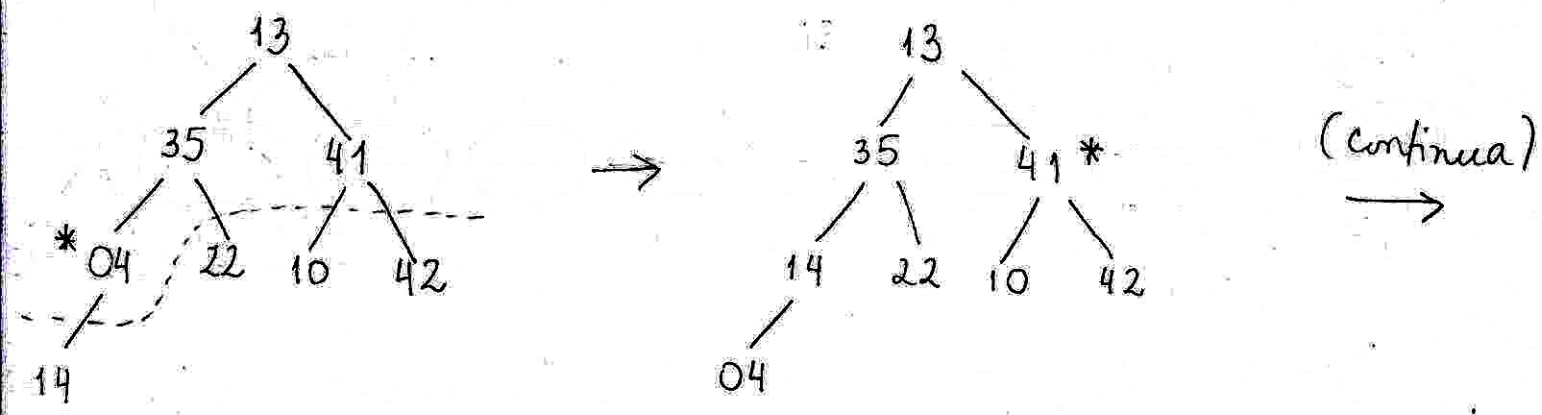
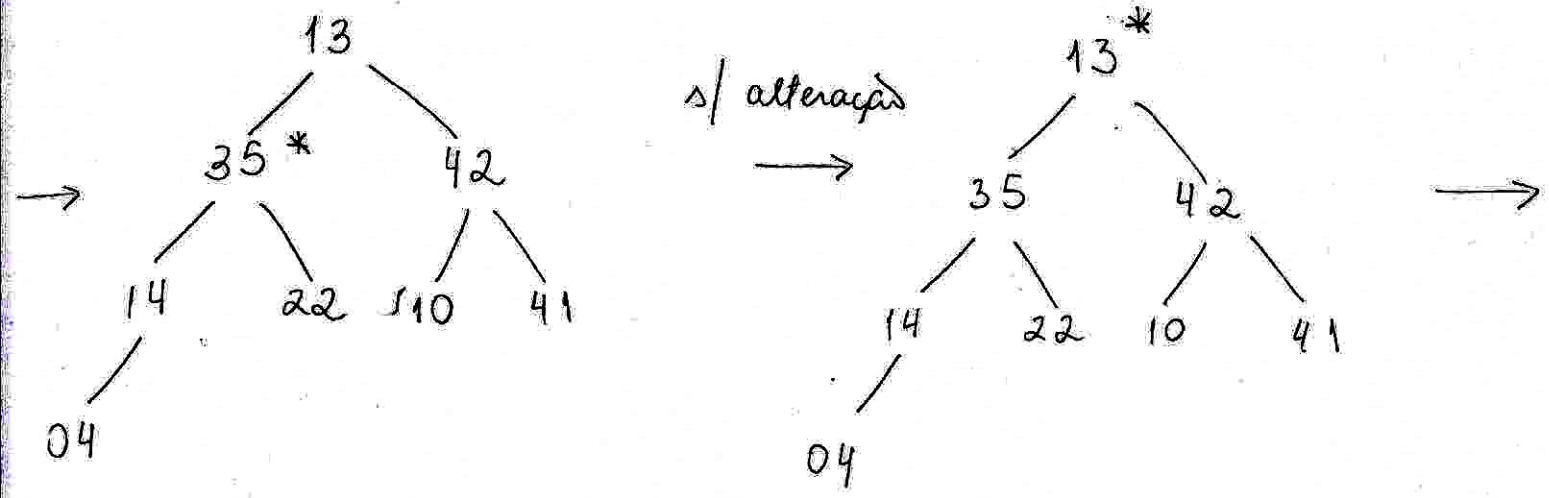
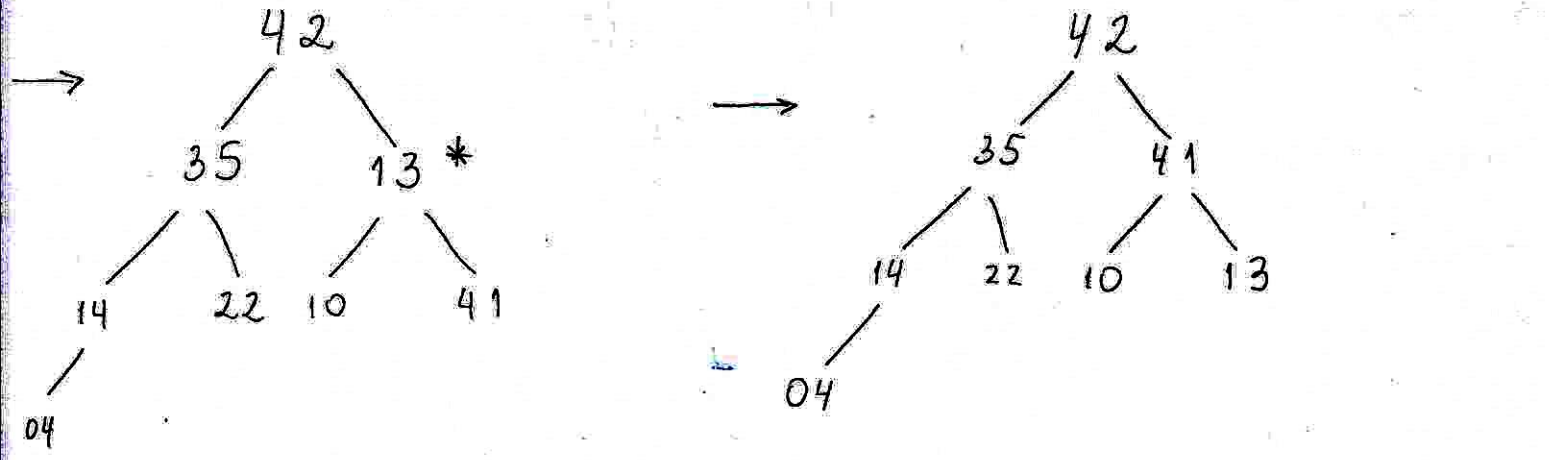
(5) Construindo o heap: (* → nó que desce)

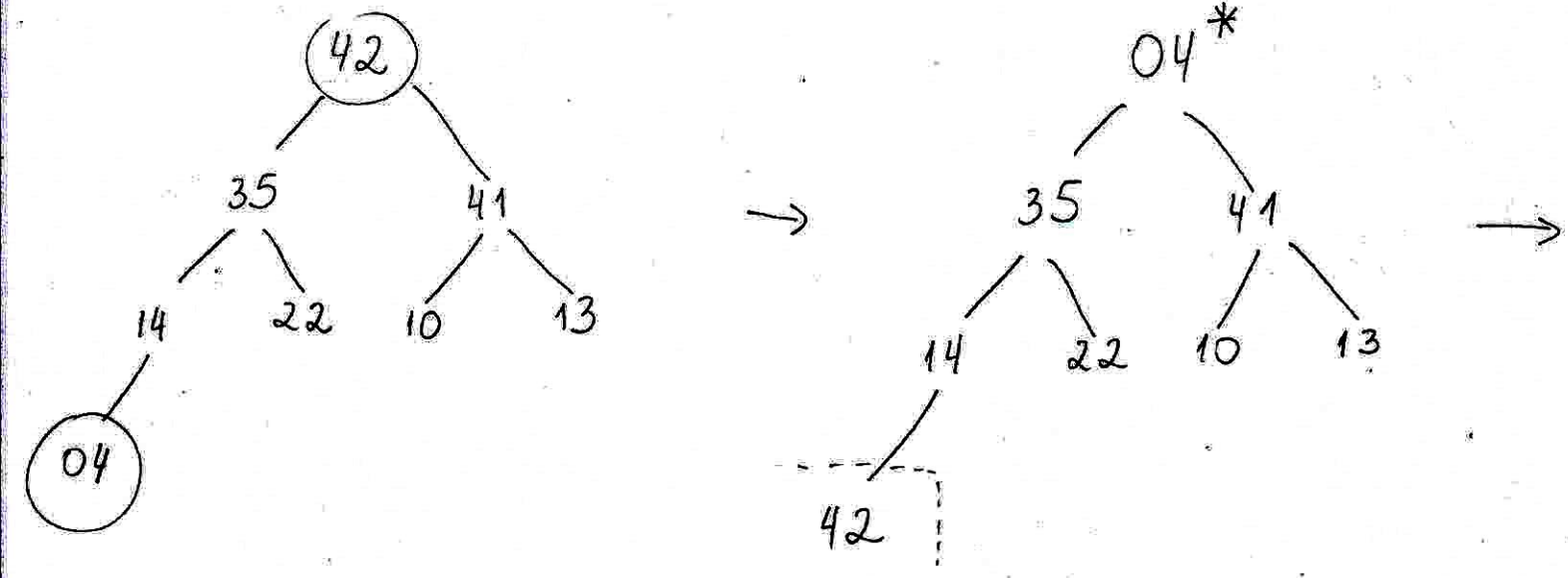


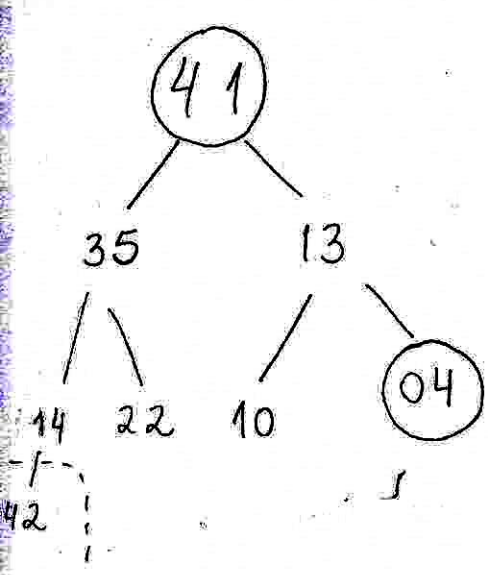
5 (Continuação)





Ordenando: (O-O nós que trocam de posição)

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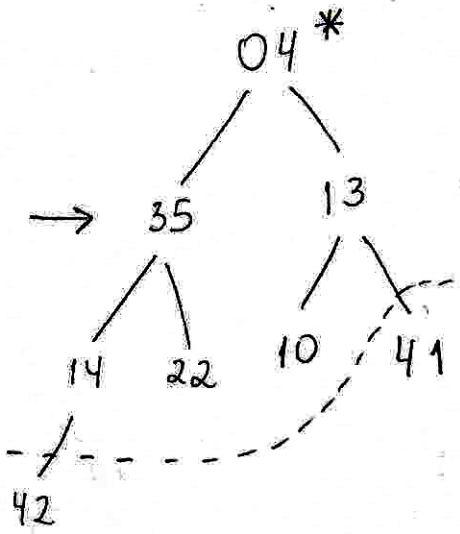
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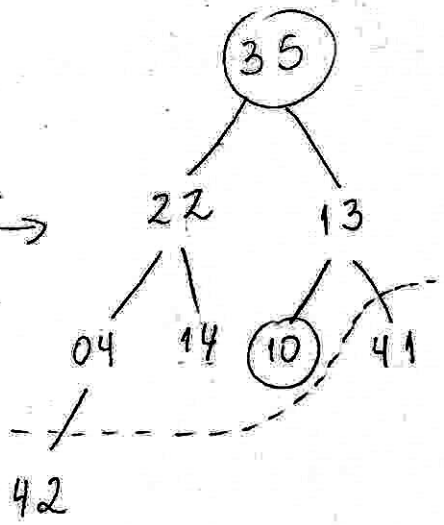
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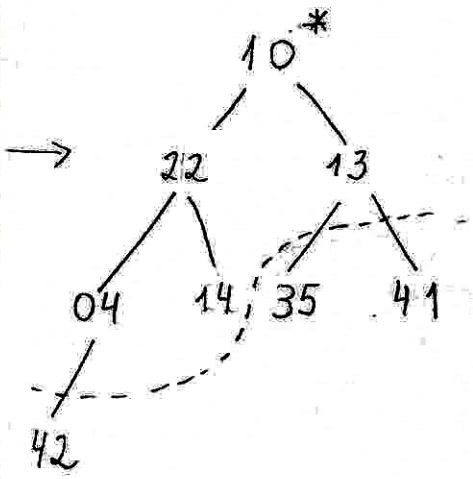
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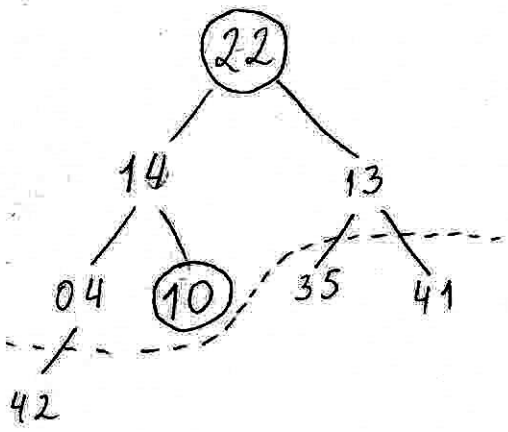
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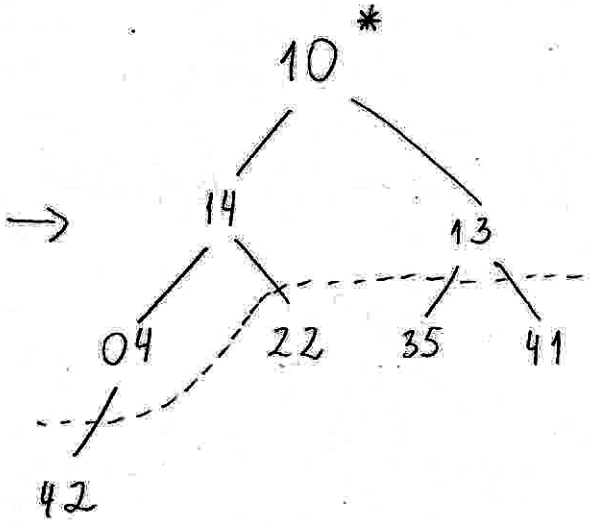
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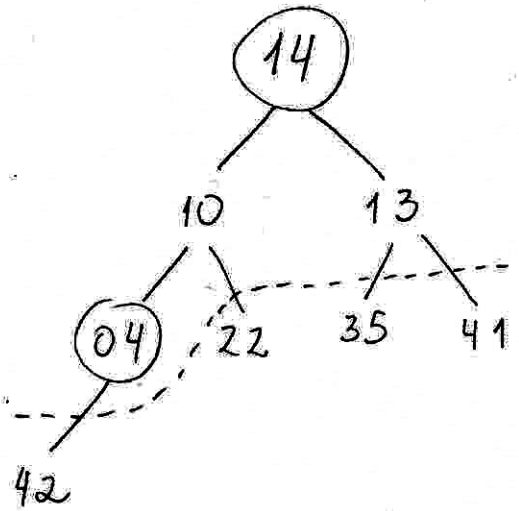
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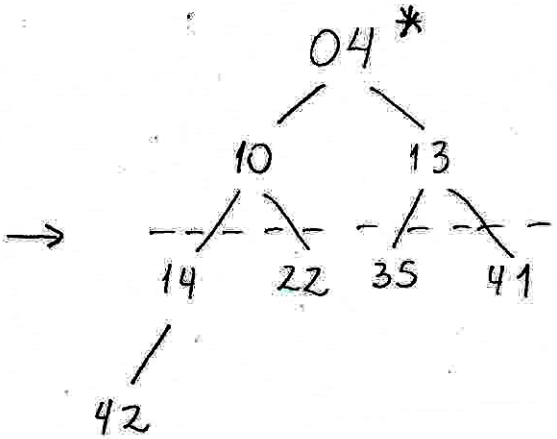
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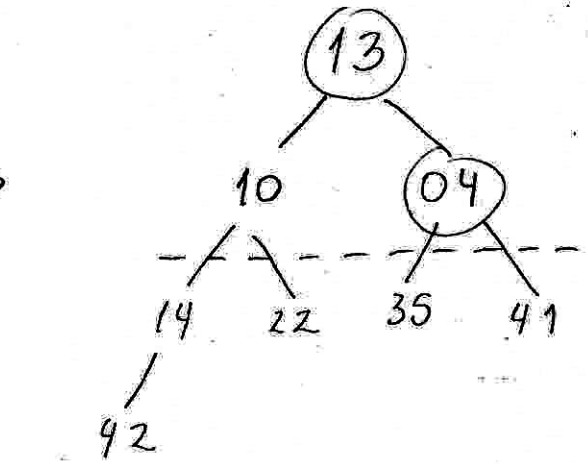
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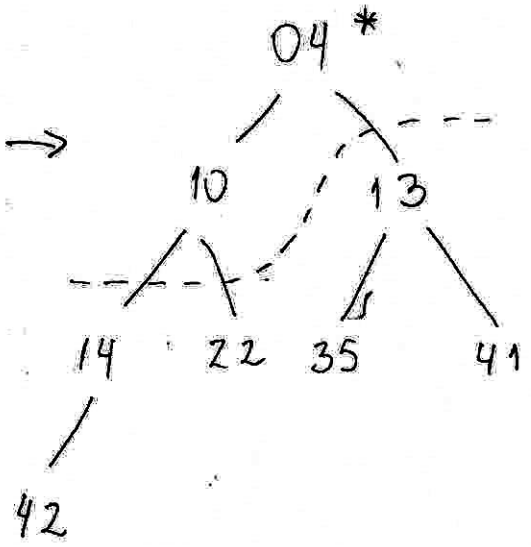
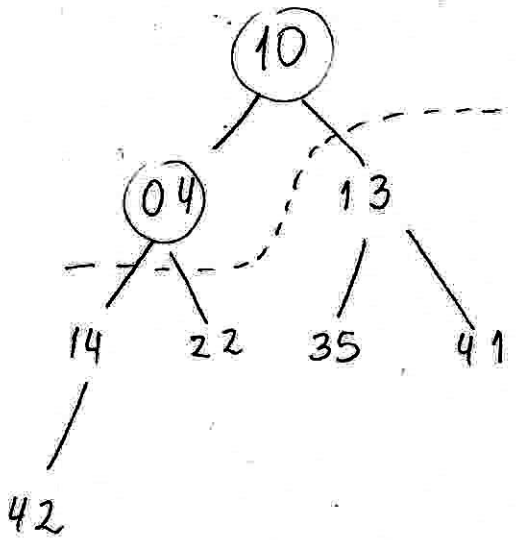
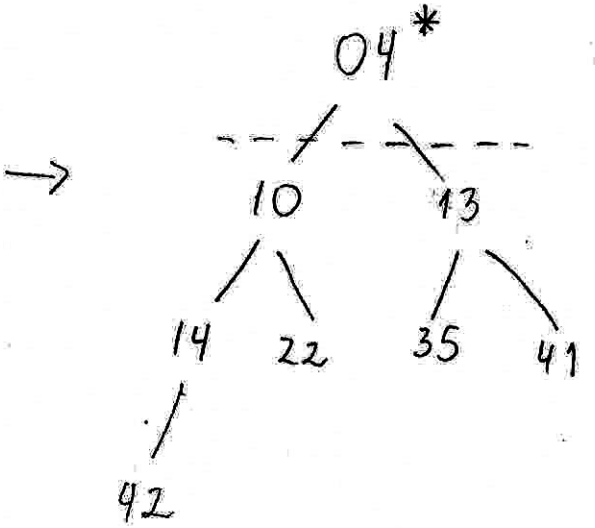
(continua)

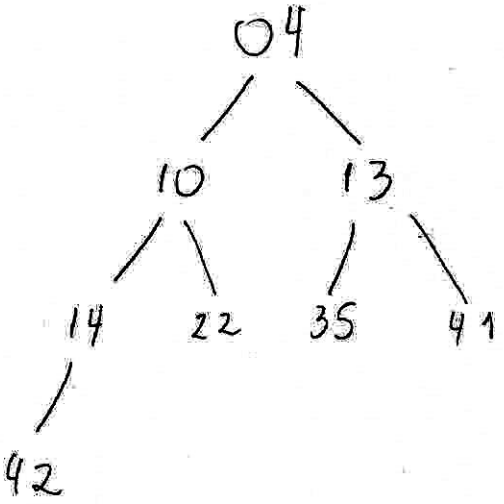
(5) (Continuação)







FIM



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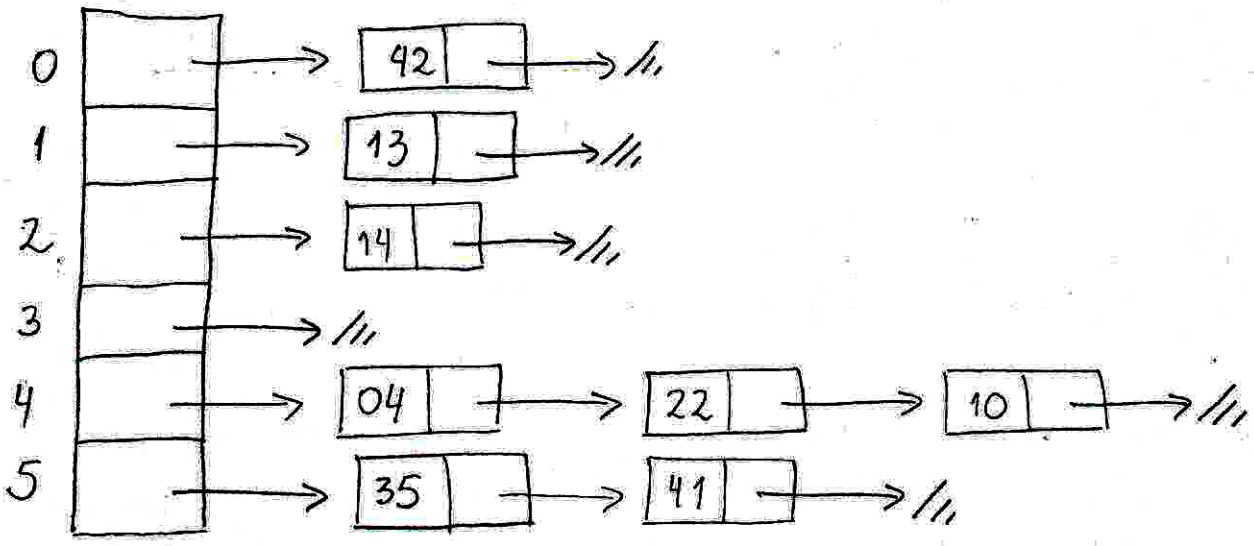
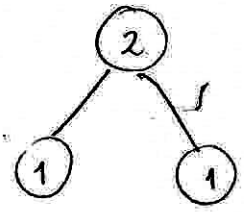
(6)

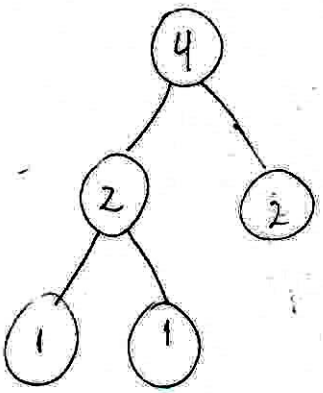


7

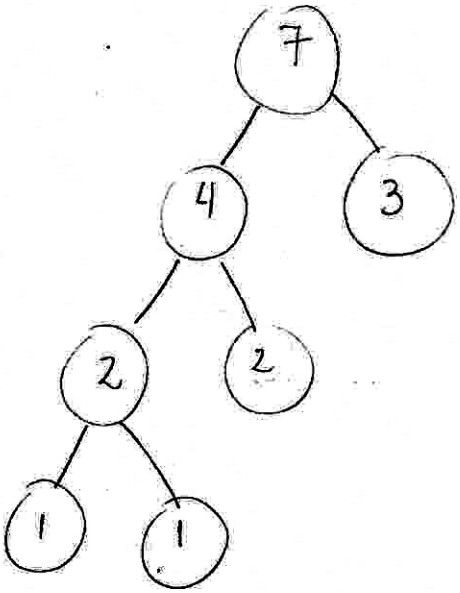
1 1 2 3 5 8 13 21



2 3 5 8 13 21



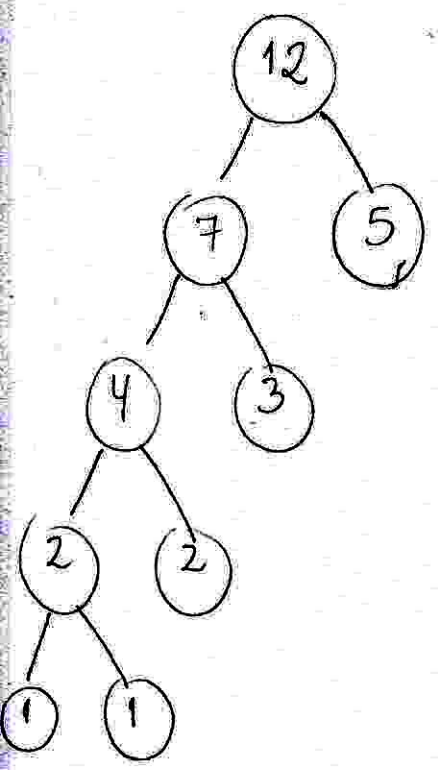
3 5 8 13 21



5 8 13 21

(continua)

(7) (Continuação)



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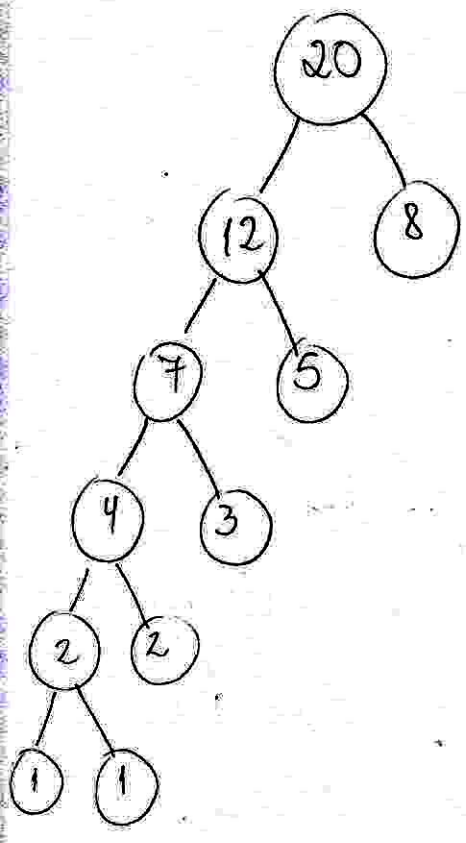

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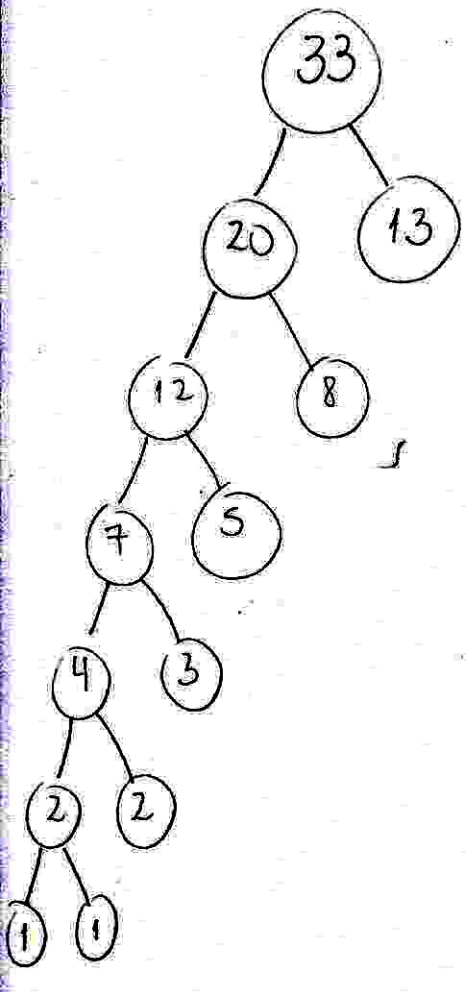
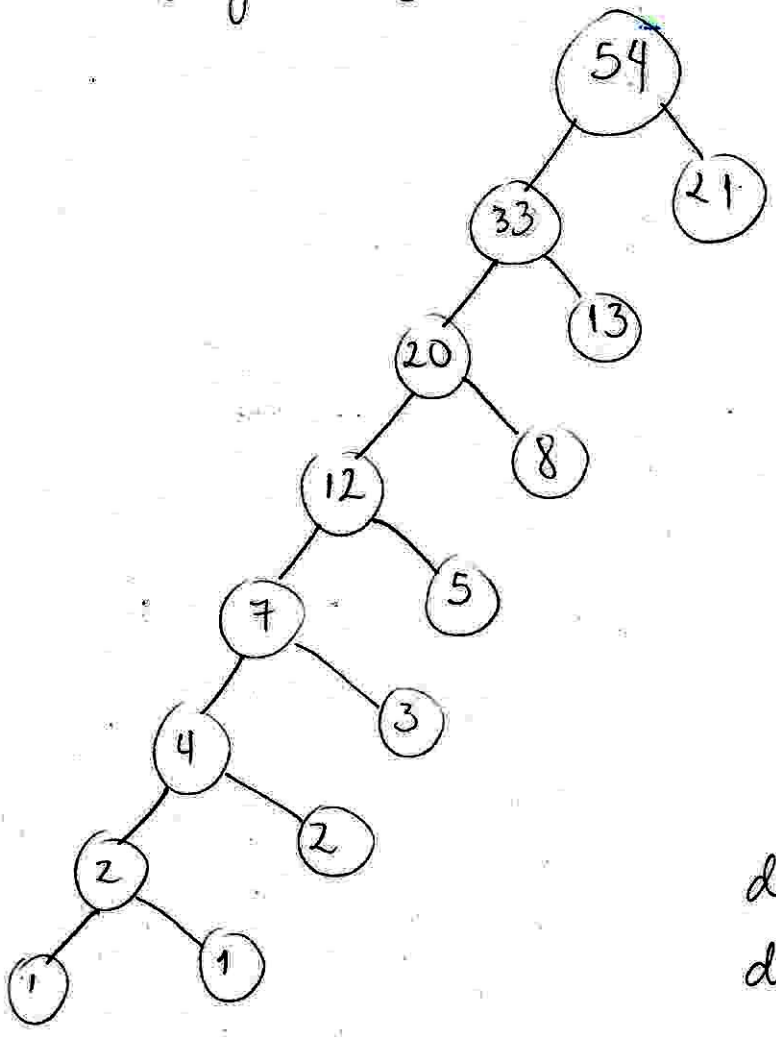


21

Árvore final



A árvore não é única pois há a opção de trocar subárvores irmãs de posição (esquerda por direita e vice-versa)