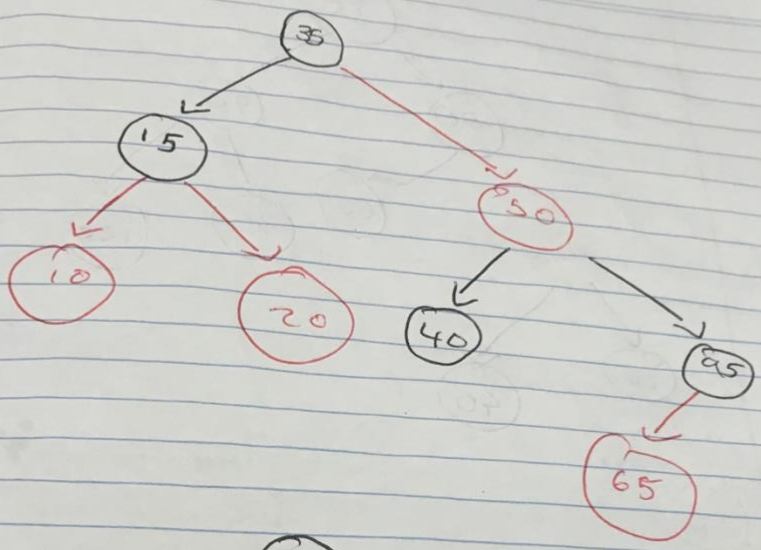
Advanced Trees Practical – Data Structures and Algorithms – By Aaron Gangemi

~~Data~~ Advanced Trees

1)



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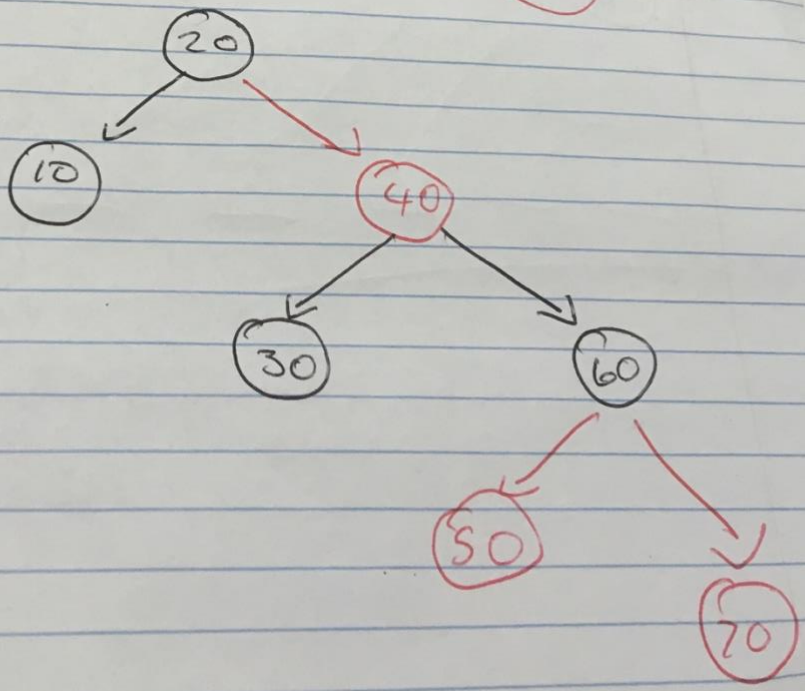
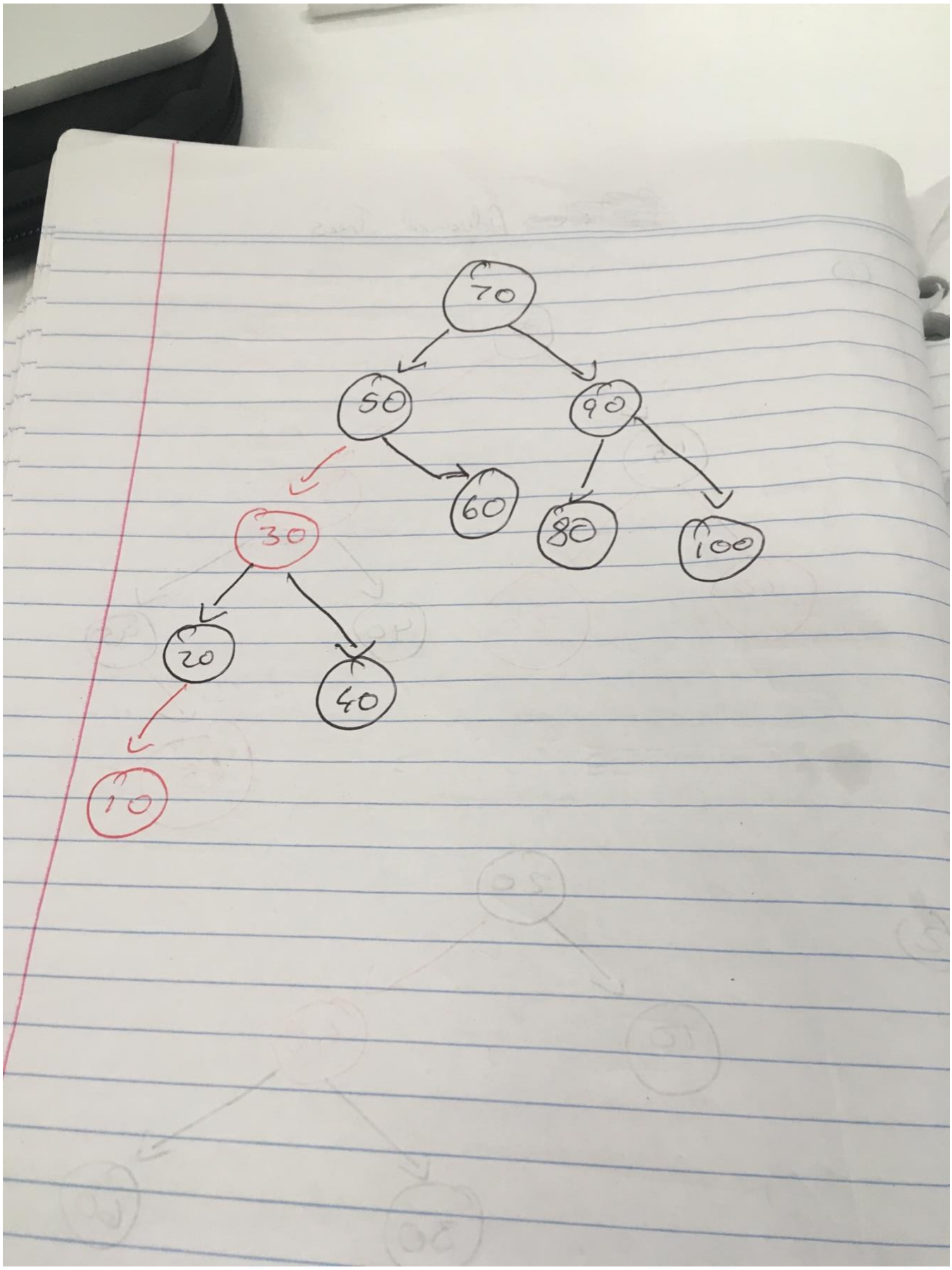
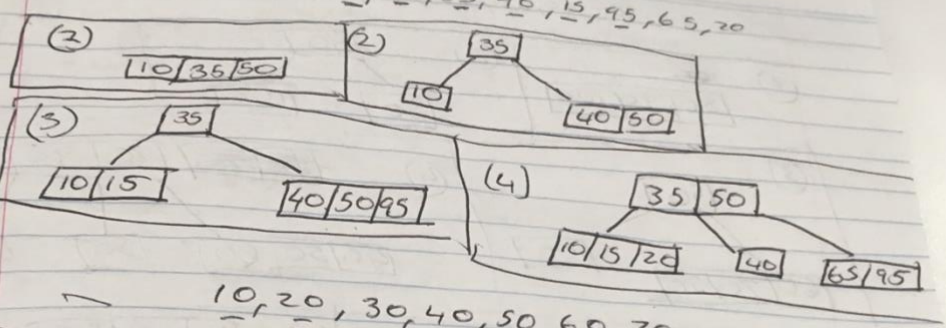


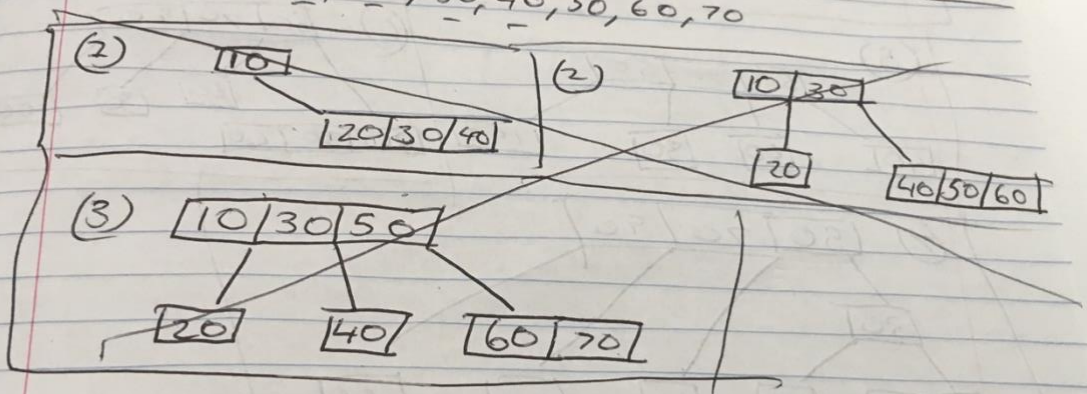

70
50
90
60
80
100
30
20
40
10

2-3-4 Trees

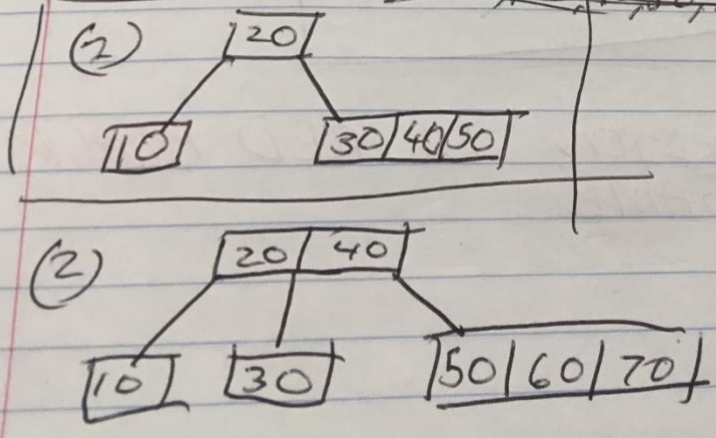
10, 50, 35, 40, 15, 95, 65, 20

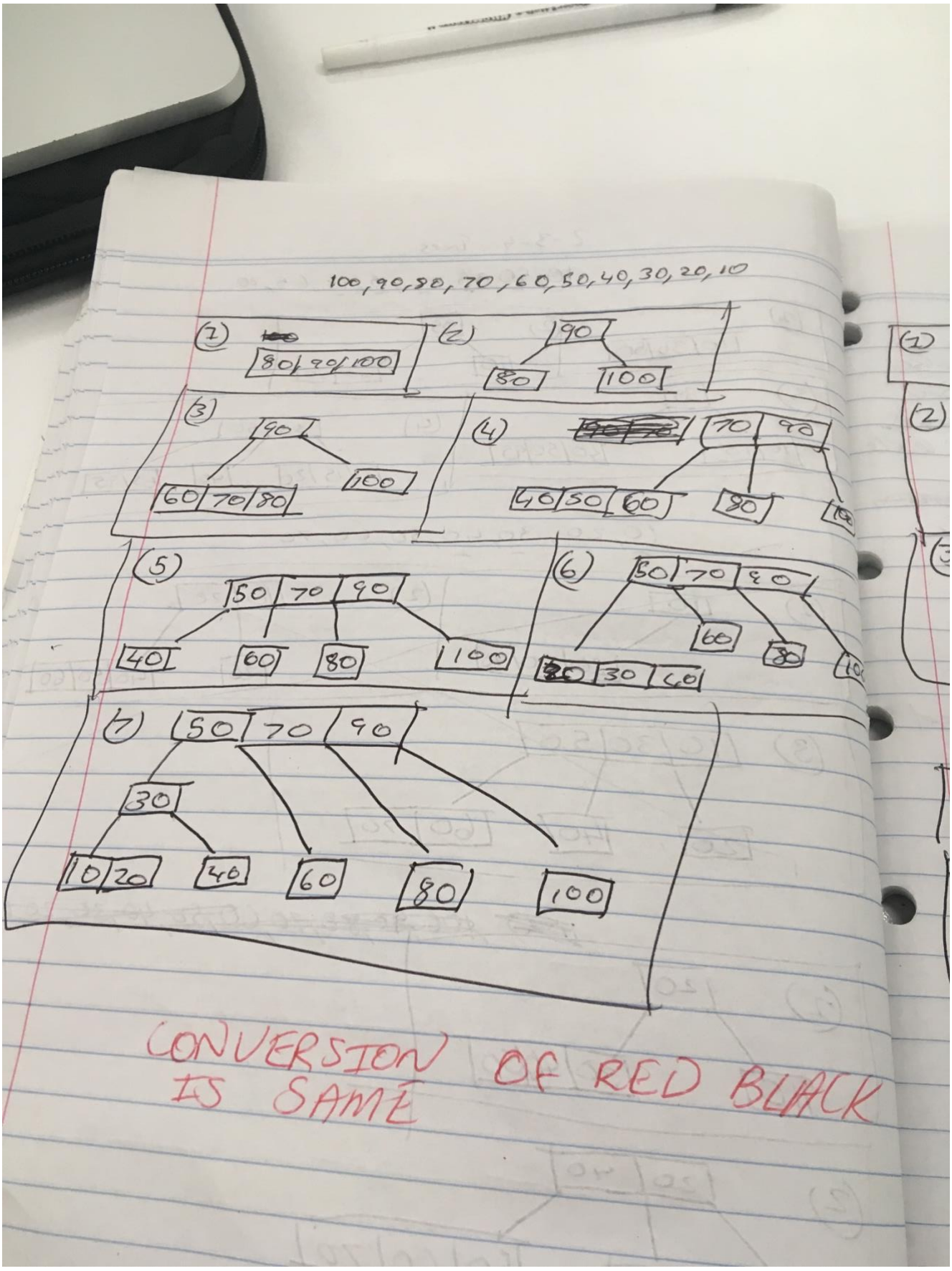


10, 20, 30, 40, 50, 60, 70



~~100, 90, 80, 70, 60, 50, 40, 30, 20, 10~~

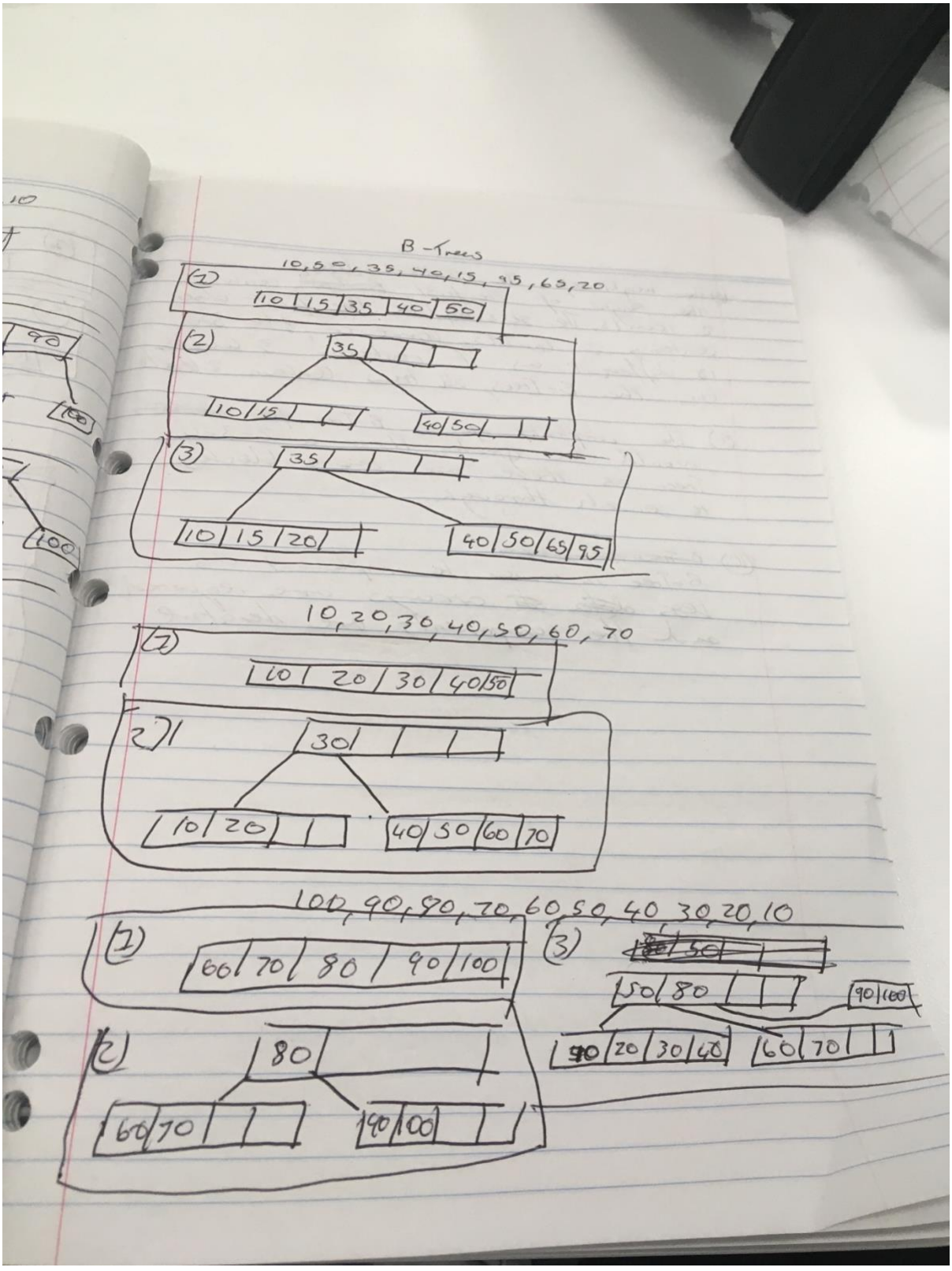



100,90,80,70,60,50,40,30,20,10
(1)
80 90 100
(2)
90
80
100
(3)
90
60 70 80
100
(4)
70 90
40 50 60
90
(5)
50 70 90
40
60
80
100
(6)
50 70 90
60
80
30 40
(7)
50 70 90
30
10 20
40
60
80
100
CONVERSION OF RED BLACK IS SAME

(9) The height of the resultant trees:
The height of the first 2-3-4 contains 2 levels. The second, like the first also containing 2 levels. However, the 3rd is different as it contains 3 levels. For the B-Trees, all trees contain 2 levels.

(9) The complexity of a B-Tree would be greater than a 2-3-4 Tree as there are more blocks to search through.

(10) B-Tree is easier to implement as less arrays are required and the components are iterative.


B-Trees
10,50,35,40,15,95,65,20
10 15 35 40 50
35
10 15
40 50
35
10 15 20
40 50 65 95
10,20,30,40,50,60,70
10 20 30 40 50
30
10 20
40 50 60 70
100,90,80,70,60,50,40,30,20,10
60 70 80 90 100
80
60 70
90 100
50
50 80
90 100
20 30 40
60 70