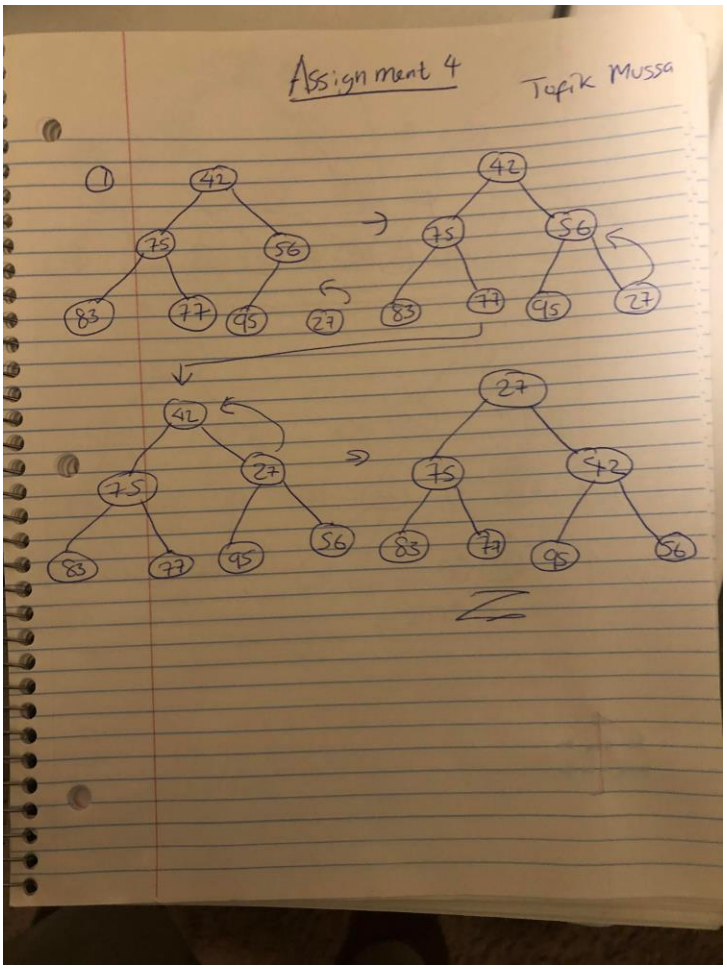
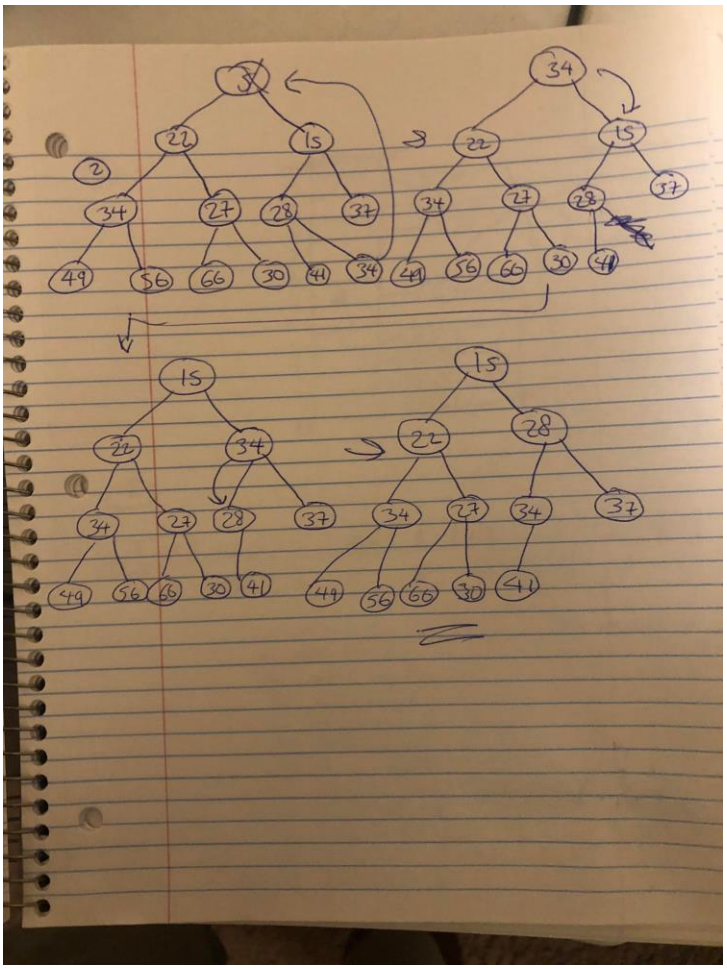
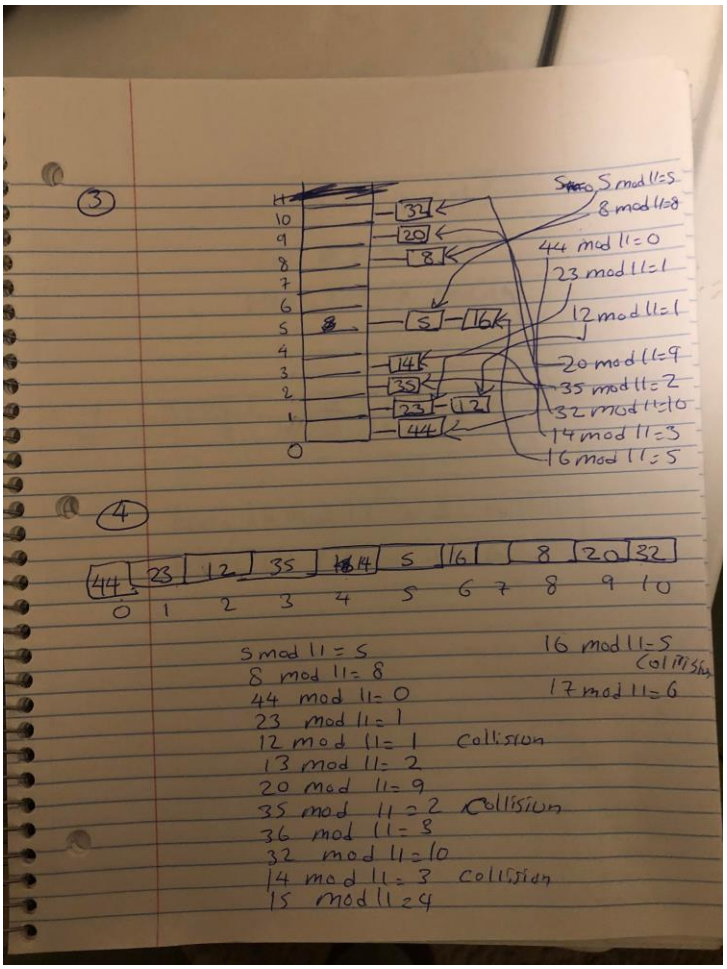
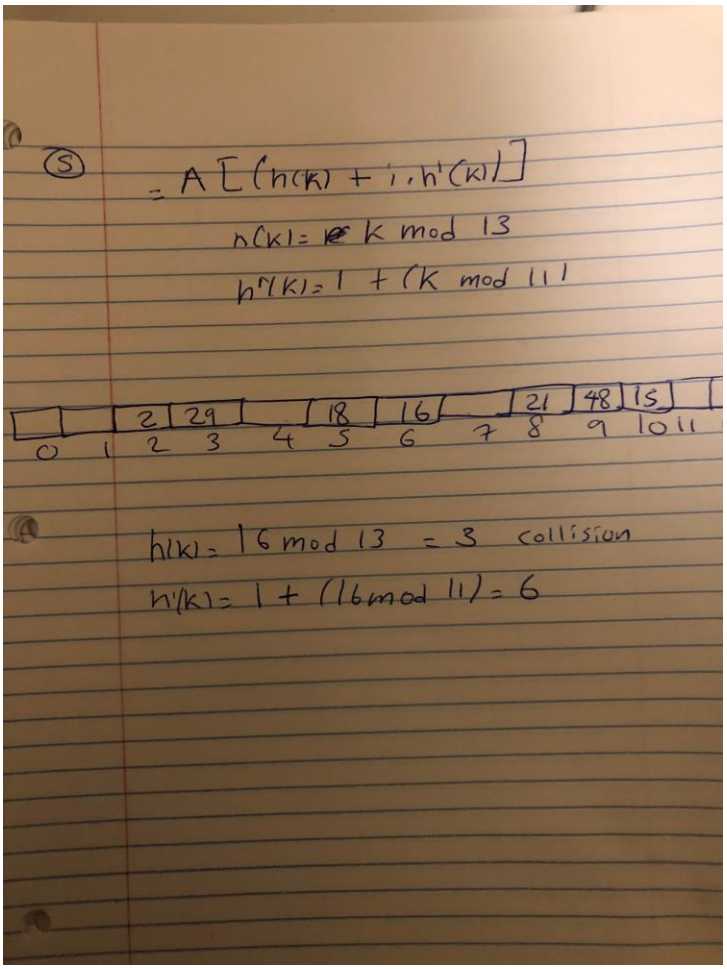

Assignment 4
Tufik Mussa
1
42
75
56
83
77
95
27
2




3
11
10
9
8
7
6
5
4
3
2
1
0
32
20
8
5
16
14
35
23
12
44
5 mod 11=5
8 mod 11=8
44 mod 11=0
23 mod 11=1
12 mod 11=1
20 mod 11=9
35 mod 11=2
32 mod 11=10
14 mod 11=3
16 mod 11=5
4
44
23
12
35
14
5
16
8
20
32
0 1 2 3 4 5 6 7 8 9 10
5 mod 11 = 5
8 mod 11 = 8
44 mod 11 = 0
23 mod 11 = 1
12 mod 11 = 1 collision
13 mod 11 = 2
20 mod 11 = 9
35 mod 11 = 2 collision
36 mod 11 = 8
32 mod 11 = 10
14 mod 11 = 3 collision
15 mod 11 = 4
16 mod 11 = 5 collision
17 mod 11 = 6



Problem 6 discussion

What I noticed from this experiment is inserting to a linked list is the fastest since it just gets appended at the tail. Searching a linked list however takes the longest since the entire list needs to be traversed at the worst case to conclude whether the item was found or not. Inserting to a hash map also took the longest from the other insertions possibly due to collisions however searching was the fastest almost like a constant time lookup. An array list is a compromise between the two; both insertions and searching is in the middle for an arraylist

Number of keys = 100000

HashMap average total insert time = 25

ArrayList average total insert time = 6

LinkedList average total insert time = 2

HashMap average total search time = 13

ArrayList average total search time = 6701

LinkedList average total search time = 23029