CSE 462
Offline on Splay Tree

You have to implement a height balanced splay tree (CPP/ Java object oriented code) with n elements. Implement the following functions.

Task	Function	Description	Expected Complexity	Marks
1	Print(T)	Print the tree T, get the code here. You can modify the code according to your Splay Tree code.	Doesn't matter	1 *[but' it's a must]*
2	Splay(x)	Do the splay operations and bring x to the root.	O(log n)	6
3	Search(x)	Do the Search operation using the splay operation.	O(log n)	2
4	Insert(x)	Do the Insert operation using the splay operation. Make sure you are using Split(x).	O(log n)	2
5	Delete(x)	Do the Delete operation using the splay operation. Make sure you are using Join(L,R).	O(log n)	2
6	Testing and Report			2

Testing and Report:

- Run **N (=104, 1004, 10004)** number of random operations (only Search, Insert and Delete operations) on your Splay Tree code. Each **N** number of operations must include at least one operation of each type.
- Note how much time is taken for each **N**. Calculate also the time taken per operation for each **N**. Verify that order of each operation is amortized O(log n).
- Generate test cases with small input set to test the compatibility of your implemented code. *[It's a must]*

Bonus: *[5 marks]*

Implement the height balanced **AVL Tree**, verify the height is O(log n), and compare the height and execution time per each operation for each **N** with those of **Splay Tree**.