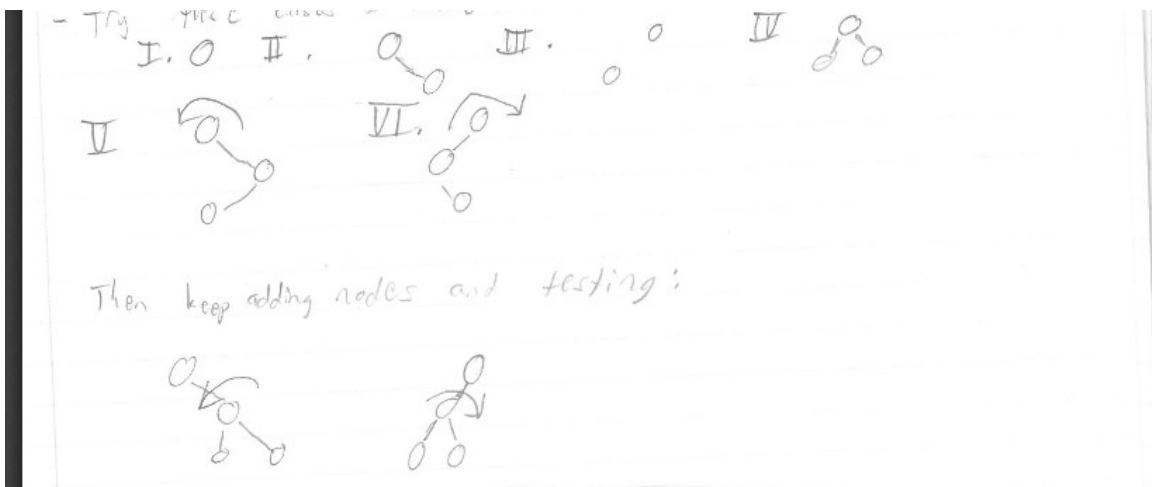


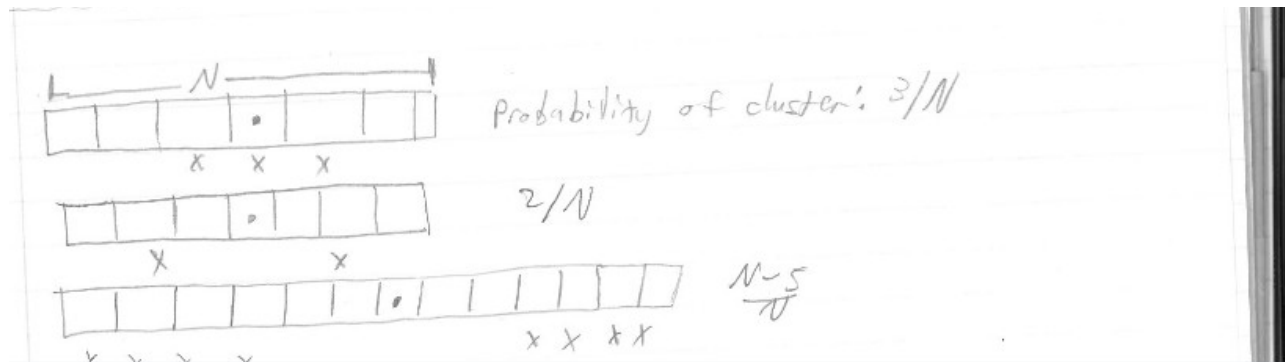
CS280 – HashMaps February 29, 2016

AVL Questions

- On rotation, losing whole sections of the tree
 - Can't rotate if there are no children
 - Try these cases to make sure rotation is working



<http://azrael.digipen.edu/~mmead/www/Courses/CS280/Hashing-1.html>



Inserting with clusters

- 2/3 full gives you an average of 2 comparisons

Quadratic Probing

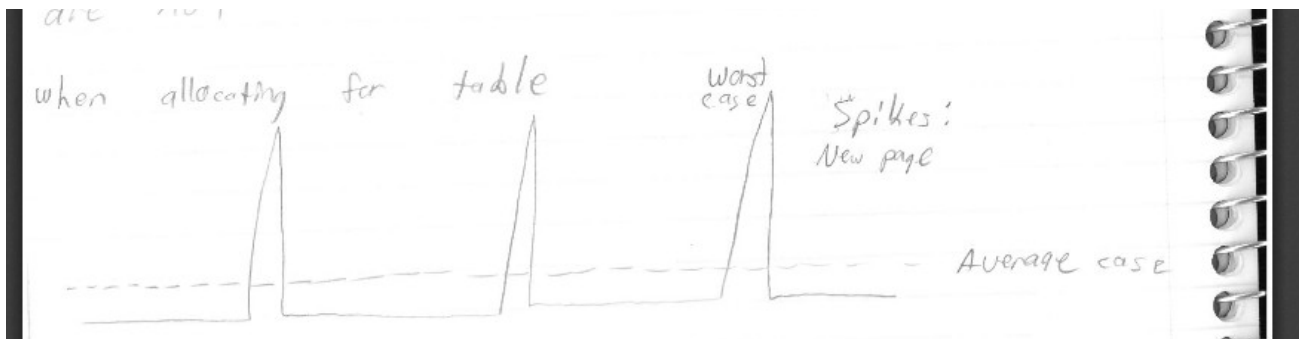
- Instead of just going over by one on a collision, go over by (Collision #)² 1², 2², 3², etc...

Pseudo Random Probing

- Use key as seed
- Generate PRN and walk by that amount if there is a collision

Secondary Hashing

- Hash again if there is a collision
 - Do the hash, then walk by the index it gives you
 - Must make sure the secondary hash function never returns 0
- Again, **prime table size** is important
- Hash tables are cache friendly while trees are not



When filling the table, note how the average time is still very good despite the large spikes

Deleting Items

- Lazy deletion
 - When walking clusters and find a spot for insertion, DON'T put it there, put it at the first deletion
- PACKing
 - Re-adjust the cluster on a deletion
- Good hash functions and not letting the table get too full are what makes a good hash table
- Only difference between linear and double hashing is the size of the stride

- Don't have code that is exactly the same except for the stride, use an if check!

