CS280 – Recursion, ADT
Febuary 1, 2016

http://azrael.digipen.edu/~mmead/www/Courses/CS280/Recursion2.html

B-List Notes

- Use the output that goes step by step to help find bugs in the insert function

Misc. Things

- "Long jump" – Don't look it up if you don't know what it is
- 75% of interview questions come from this class

Recursion

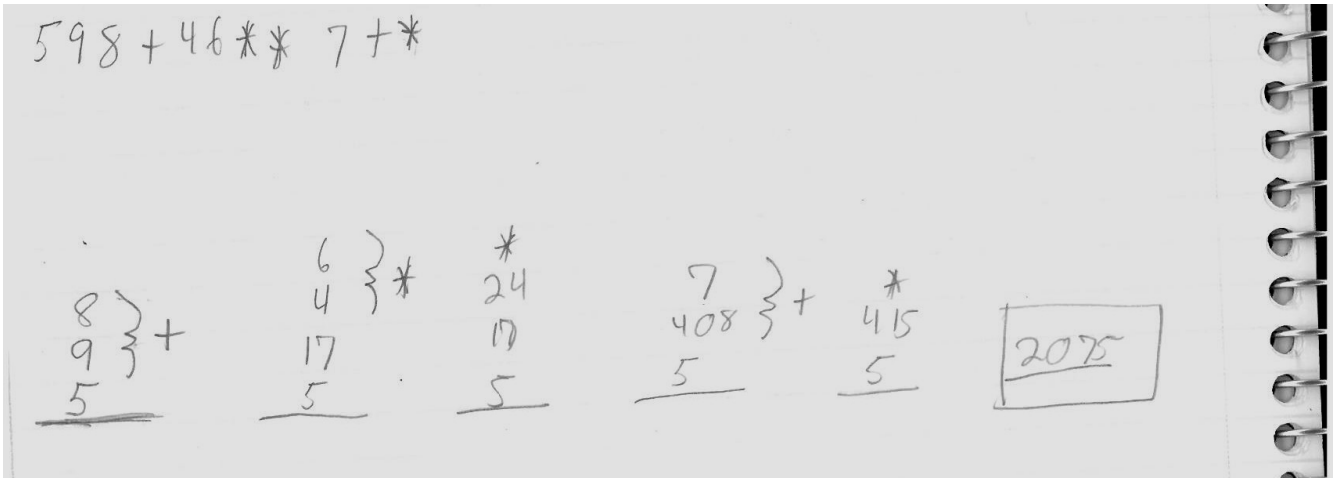
- **8 Queens Problem**
  - Uses a backtracking pattern
  - Think of backtracking like being in a maze and you come to a fork in the road, and another fork, and another... You go to the very end of one fork until you reach a dad end, then you go back to the last fork and follow it to a dead end. You keep going back to previous forks and following each fork to a dead end until you get to what you are looking for.
- **Knights Tour**
  - Form of a Hamiltonian circuit: When you end up back where you started after hitting every possible position
- **Sudoku Assignment**
  - We can use anything from the STL
  - Helper functions!
  - Don't try and build a game while you are building an engine
  - Suggested helper function
    - ValidateBoard: Make sure this is working so you can actually debug your algorithm

- Use command line arguments to change the bahavior of the driver
- Callback function
  - Every tie we make a move we call it so the driver can update
  - We do this because our solve function will be blocked until it returns
  - Lets us keep or code really clean and platform independent, with the driver doing all the output
- Don't hardcode the size of the board
- We are concerned with the algorithm, not the data structure, in this assignment
- When we call the callback to stop, the driver simply doesn't return so our function 'pauses'
- Check the return value of the callback to see if we need to exit
- Back-track out of the function

Abstract Data Types

http://azrael.digipen.edu/~mmead/www/Courses/CS280/AbstractDataTypes.html

- There is no best data structure, different structures for different uses
- **Stack**
  - O(C) – Access
  - O(N) – Grow
  - -3: Prefix operator
  - 5 + 4: Infix operator
  - 3++: Postfix operator



Example of using a stack to parse Reverse Polish Notattion