

LEC 11

**CSE 123**

# Recursive Backtracking

Questions during Class?  
Raise hand or send here



sli.do #cse123

**BEFORE WE START*****Talk to your neighbors:***

*What's your favorite food mascot? (e.g., Chester Cheetah, Cinnamon Toast Crunch, Jolly Green Giant)*

**Respond on sli.do!****Instructor: Miya Natsuhara****TAs:**

Arohan	Shiven	Yuntong	Anya
Sreshta	Vrinda	Amiya	Anisha
Rushil	Gavin	Sahana	Trien
Sean B	Shreya	Anirudh	Neal
Chloe	Jonah	Rohan	Evan
Jenny	Renee	Crystal	Rena
Nate	Chris	Eeshani	
Saachi	Ishita	Prakshi	
Hawa	Kuhu	Aidan	
Maggie	Kavya	Cora	
Sean E	Misha	Nhan	

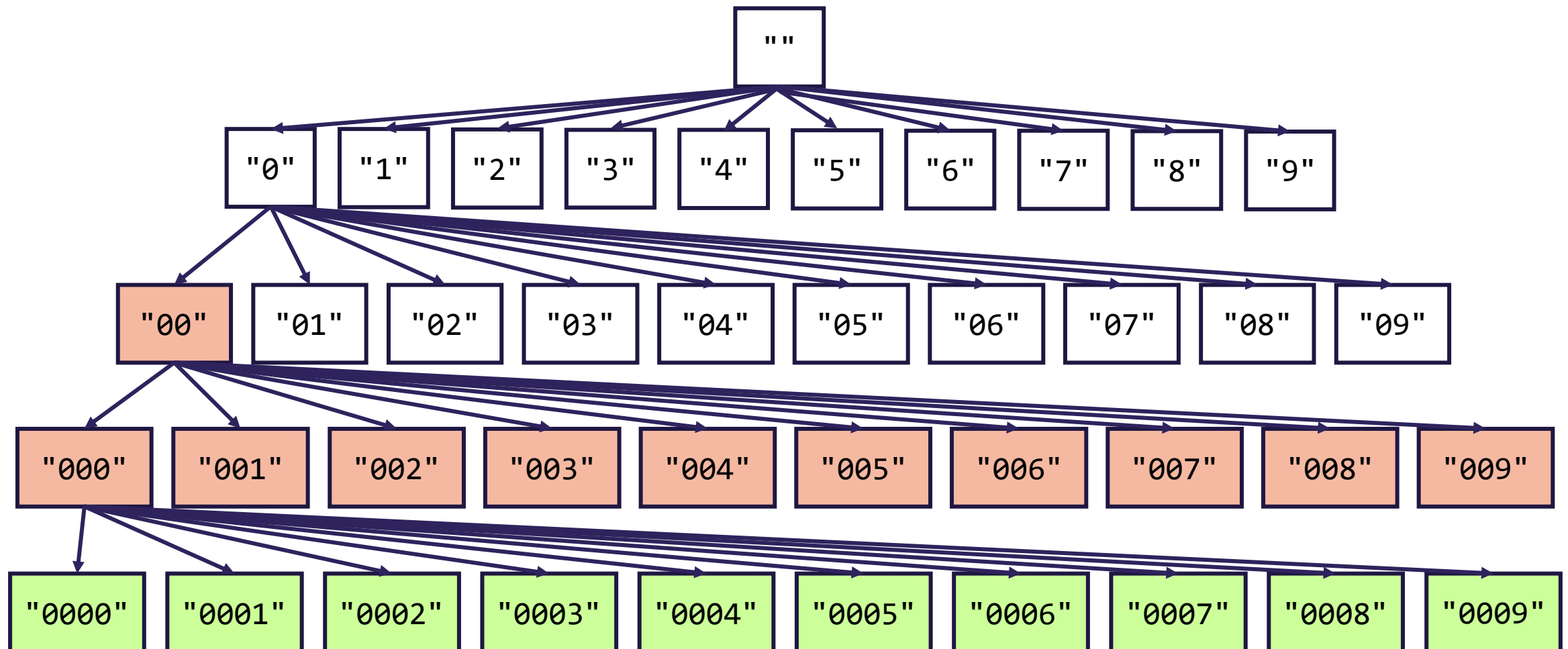
**Music:**  [CSE 123 26sp Lecture Tunes](#) 

# Announcements

- Creative Project 2 is out, due Wednesday, May 13
  - Focused on recursion!
- Resubmission Cycle 3 closes tonight (Friday, May 8)
  - PO, C1 eligible
- [CSE 12X TA application](#) is open!

# Password Cracker

- Now, what if we knew the sum of all digits was 5?





# Updated Exhaustive Search Pattern

```
public static void search(input) {
    search(input, "");
}

private static void search(input, String soFar) {
    if (base case) {
        // Do something with soFar (e.g. print it out)
        System.out.println(soFar);
    } else if (not dead end) {
        // Might not be a loop, but 1 recursive call for each option
        for (each option) {
            search(input, soFar + option);
        }
    }
}
```

# Recursive Backtracking Pattern

```
private static void search(input, List<Character> soFar) {  
    if (base case) {  
        // Do something with soFar (e.g. print it out)  
        System.out.println(soFar);  
    } else if (not dead end) {  
        // Might not be a loop, but 1 recursive call for each option  
        for (each option) {  
            soFar.add(option);           // Choose  
            search(input, soFar);       // Explore  
            soFar.remove(soFar.size() - 1); // Unchoose  
        }  
    }  
}
```

# Scrabble

- We have a set number of letter tiles to choose from in a given turn
- Each letter has a particular number of points associated with it
- Our goal: find the best (highest-scoring) word we can make by combining our letter tiles

