Abstract Data Types (ADT)

Questions
ADT
Bags
Stacks

- An abstract data type is a model of a collection of data that specifies
  - the characteristics of a collection of data
    - is it ordered?
    - are elements unique?
  - the operations that can be performed on the collection

Other examples? relationship between data
Fixed size

- does not specify the how
- can have multiple implementations

Why is this different from an interface in Java?
Language specific (Number, python don't have)
An interface is one way of expressing the ADT (UML is another)

[redacted]

Bags

Our first ADT

Collection of data that is unordered, not unique (allows duplicates) characteristics

Initially - fixed size

Applications

Scrabble Bag
Spell Check Dictionary
⋮

Why not just use arrays?

Set
Unordered ; Unique
This is a different ADT

What are our operations? (In English)

int	getCurrentSize()
bool	IsEmpty
bool	add
T	remove(T)
void bool Bad	clear
int	getFrequency()
bool	contains
	grab()

Do interface
Do test
Do array bag

Abstraction on board
English on board

OOD

Talked about inheritance
- "IS A" relationship

Composition

Has - a relationship

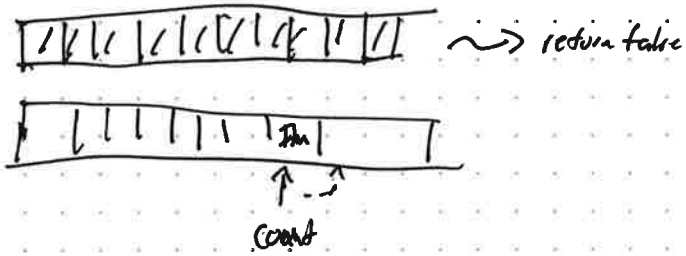
Array Bags

add(String s)

English

1. If there is no room, return False
2. If there is room, insert value at index Count
3. ~~Return~~ Increment Count
4. Return False

Visual



Code

```
if (count >= contents.length)
    return False
else
    contents[count] = item
    ++count;
    return true
```