



ITEC 120

Lecture 28
Array Usage

Review

- Arrays
 - Algorithms
 - References
 - Copy

Array Usage

Objectives

- Look at how to use arrays
 - Capacity
 - Marking / Segmenting
 - Parallel Arrays

Array Usage

Arrays

- Fixed size
- How can we “tombstone” a particular spot in an array i.e. declare it is dead and all after it is dead as well



Array Usage

Solution

What can we do with this?
What do we have to be careful with?

- Added variable

"Dead places"

int tombstone;
tombstone = 3;

Array Usage

Capacity

- Create an array, but not fill it with data

```
int array = new int[3];
int end=0;
array[end] = scan.nextInt();
end = end +1;
```

How do you make sure you don't overflow the capacity of the array?

Array Usage

Example

- Create a function that will set a value in an array and update where the capacity is or return -1 if you try to insert into the end of the array

Array Usage

Swapping

- Replace one value w/ another and vice versa

Array Usage

Method

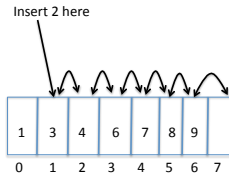
- How do you swap the values stored in variables x,y in this scenario?

```
int x=5;
int y=4;
```

- What is different than the array scenario?
- How do we swap values in an array?

Array Usage

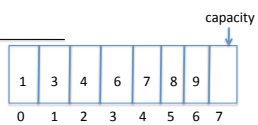
Inserting



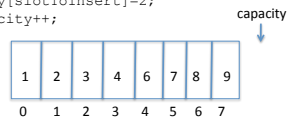
What is the algorithm that you would use to move the numbers around

Array Usage

Code



```
int slotToInsert = 1;
for (int i=capacity; i>slotToInsert; i--)
{
    array[i] = array[i-1];
}
array[slotToInsert]=2;
capacity++;
```



Array Usage

Marking

Modified tombstone

- Array of sorted values (test scores)
- Need to find a cutoff point (70)
- How many people are on each side?
- What is the average of each side?

Array Usage

jEdit example

Marketing

- Have an array of salaries for company
- Need to figure out how many are making
 - <5k (Temp workers)
 - Between 5-20k
 - Between 20-40k
 - Between 40-100k
 - Greater than or equal to 100k

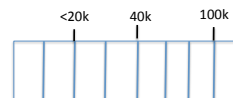
Array Usage

Visualization

Similar to marking a piece of wood before cutting it.

Similar to substring calls

- Several state variables



Array Usage

Parallel Arrays

- Storing multiple related values together
- One array can't do it
- Many arrays can

First name	Last name	Account Balance
John	Doe	300.00
Alpha	Bet	26.00
EI	lte	1337.00

Array Usage

Parallel Arrays

- Multiple arrays
- One index used to get related values

```
double[] account;
String[] first;
String[] last;
//Code to create and initialize the arrays
int userToPrint=scan.nextInt();
System.out.println(first[userToPrint] + " " + last[userToPrint]);
System.out.println("Account Balance: " + double[userToPrint]);
```

Array Usage

Issues

- Adding and removing values from parallel arrays
 - Stock data (symbol, high, low, current)
- How do you add?
- How do you remove?

Array Usage

Review

- Array usage
 - Swap / Insert
- Marking
- Parallel arrays

Array Usage