Introduction to Programming − Concepts and Tools

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Week 6

Today's Goals

- Reminder of last week
- Where you should be by today
- Warm−up
- Lecture
  - Classes
  - Objects

Last week: Analysis of algorithms, sorting

- Concept:
  - Big Oh notation
  - Common growth rates
- Linear search: O(n), binary search O(log(n))
- Selection sort: O(n^2)
- Quick sort: O(n*log(n)) on average, but O(n^2) worst case
- Other algorithms:
  - Bubble sort (bad)
  - Heap sort: always O(n*log(n))

Where you should be

- Theory
  - Read chapters up to (and including) chapter 5
  - Read the relevant sections in Peter Sestoft's notes
  - Understand basic sorting techniques on arrays
  - Understand the difference between complexity of an algorithm, and actual run time
- Praxis
  - Use arrays in your programs to hold large amount of homogeneous data
  - Operate on arrays
  - Use methods to structure your code
  - Completed assignment 5

Reminder

- Recursion
  - Refers to methods/functions calling themselves, usually on a small sub−task
  - Format (most often):

```
if(stopping condition)
   ...
else
  // recursive call
```

- Signature of a method
  - Return type, name, and parameter types
  - Do not change the signature! It is the interface to your methods.

Warm−up

- What is printed?

```
public static main(String[] args){

  int[] arr1 = {1,2,3};
  int[] arr2 = {1,2,3};

  System.out.println("Equal? " + arr1==arr2);
}
```