CS 302 Week 2

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Retrieval Practice

2 minutes - recall and write down key points from last lecture
- and current problems from CodeLab and P1
Studying

- Lots of little concepts
- Systematic thinking
- Piazza, Consulting, Office Hours

http://www.mendhammoves.com/articles/rescue_dogs/puppy.png
http://www.hillsborococ.org/storage/post-images/what-can-i-do.jpg
http://www.chinatourguide.com/china_photos/Guilin/Attractions/yangshuo_cooking_class_learning_3.jpg
Team Labs

● First meeting this week.
● 1350 cs and 1370 cs
● Assigned seats, find name tent
● Ice breaker - 6 steps for a task
  a. invitation to share contact information
● Pair up with someone in group of 6
  a. work on lab together
P1 - Math Trainer

● Available
  ○ 3 milestones, Friday to Thursday for each

● Work individually
  ○ Discuss concepts, don’t share code

● Style and Commenting

● Scanner Example
Testing Server Response via Email

*** FAILED: Test01_StartupMessage_M123.test

(-1) Your program did not print the correct welcome message
Expected to find this message within your output:

Hello and welcome to the Math Trainer!
======================================

Your output:
Welcome to the Arithmetic Trainer!
==================================

Which math operation would you like to practice?

Enter your choice:
Questions

(Degrees Fahrenheit – 32) x  \( \frac{5}{9} \) = Degrees Celsius

What symbols have different meanings in Java?

What changes must be made to implement this equation in Java?
Demonstration

\[(\text{Degrees Fahrenheit} - 32) \times \frac{5}{9} = \text{Degrees Celsius}\]
Review

(Degrees Fahrenheit – 32) x 5 / 9 = Degrees Celsius

What symbols have different meanings in Java?

What changes must be made to implement this equation in Java?
My List

- X vs *
- equals (==) vs assignment (=)
- value is stored on the left hand side of assignment (=) operator
- Variables:
  - name areas of computer memory, declare before use, declare type of data, initialize
- Variable names:
  - start with letter, include letters numbers and _, but no spaces
- Conventions:
  - camelCasing, spell out names
- Semicolon at the end of statements
Programming Errors

Syntax
- compiler error

Logic
- program runs but provides wrong values

Runtime
- program crashes or throws exception
Programming Errors

Syntax/Compile time
- Editor
- Hello.java
- Compiler
- Hello.class
- (Virtual) Machine
- Computer

Runtime & Logic
- Files
- Programmer
Calling java.lang.Math methods

```java
int age1 = 5, age2 = 25;

int result = Math.max( age1, age2);
double numInts = Math.pow( 2, 32);
double root = Math.sqrt( 16);
```
Comments

// until end of the line
/* until
   */
/** Javadoc
   */

Variable Names & Named Constants

Magic numbers: numbers that show up in code and somehow the code runs.

```java
int d = 3;
int s = d * 86400;

final int SECONDS_IN_DAYS = 24 * 60 * 60;
int days = 3;
int seconds = days * SECONDS_IN_DAYS;
```
java.util.Random

//create a Random number generator
Random randGen = new Random( 123 );

//use random number generator
int valueA = randGen.nextInt( 5);
int valueB = randGen.nextInt( 5);
int valueC = randGen.nextInt( 5);
Escape Sequences

Special character sequences within a String

\n
\" \\\
\\ \\	

System.out.print( "Fred says \"hello\"\nthis morning.");
Scanner

String note = "This is
a 3
line note.";
System.out.println( note);

This is
a 3
line note.
String note = "This is
na 3
line note.";
Scanner input = new Scanner( note);

String str1 = input.nextLine();
String str2 = input.next();
if (input.hasNextInt()) {
    int num = input.nextInt();
}
input.nextLine();
String str4 = input.nextLine();
boolean Data Type

```java
boolean sunnyDay;
sunnyDay = true;
```

possible values of boolean are true and false
boolean operators

==   !=   <   <=   >   >=

int n = 6;
boolean result = (n != 5);
Lazy River

What is the difference?

```java
boolean tired = true;
if ( tired) {
    System.out.println("take break");
    tired = false;
}
if ( !tired) {
    System.out.println("keep working");
}
```

```java
boolean tired = true;
if ( tired) {
    System.out.println("take break");
    tired = false;
} else {
    System.out.println("keep working");
}
```
Side trip

boolean tired = true;
if (tired) {
    System.out.println("take break");
}
Which side of the Island

```java
boolean sunny = false;
if (sunny) {
    System.out.print("sunny");
} else {
    System.out.print("not sunny");
}
System.out.println(" and back together");
```
Chained (multiple) ifs

```java
int a = 5;
if ( a > 5) {
    System.out.println("a > 5");
} else if ( a == 5) {
    System.out.println("a == 5");
} else {
    System.out.println("a < 5");
}
```