CS 302, Week 4

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Characters - Which will work?

```java
int intValue = 0;
char aChar = 'B';
intValue = aChar; // 1
aChar = (char)(intValue + 1); // 2
char aChar = '\u0041'; // 3
```

//where is the compiler error?

p1 is Due Friday

See notes in Piazza
Debugging

Lots of time spent, learn to do it well.

- Assumptions:

  When code isn’t behaving as expected, assumptions must be wrong.

  Explain it to your dog.

  Master of the dumb question.

http://blog.codeunion.io/2014/09/03/teaching-novices-how-to-debug-code/
Debugging - Share Context

- Instead of:

  "My code isn't doing what I want. What's wrong with it?"

- Try:

  "I wanted to do X, so I wrote <some-code>. I expected to see Y when I ran this code, but instead I saw Z. What am I missing?"
Code Style

Wrapping Lines
Indenting
Temporary commenting
Testing

boundary conditions
user input
branch path
What is output?

```java
for ( int i = 10; i > 0; i -= 2 ) {
    if ( i % 3 != 0) {
        System.out.println( "i=" + i);
    }
}
```
What is the range of myNum values?

import java.util.Random;
//...
Random rng = new Random();
int myNum = rng.nextInt(4) + 8;
Dangling Else - What is print out?

if ( value >= 1 )
    if ( value <= 10)
        System.out.println("1 to 10") ;
    else
        System.out.println("> 10 OR < 1?????" );
What is print out?

boolean sunny = false;
System.out.println( sunny  ? “sunny” : “cloudy”);
What is print out?

char choice = 'a';

switch (choice) {     //switch var can be int or char
    case 'a':  System.out.println("a");
    case 'b':  System.out.println("b");
        break;
    default:  System.out.println("otherwise");
        break;
}

Navigating this Social System

- Value Fairness and Consistency in a large class environment
- Offer Detailed Program Specification on Course Website
- Offer Group Discussion (Piazza)
- Systematic process for grading
Notes

- Extended Office Hours this week: Thursday 1-4pm
- Forms Page
  - All Exam Conflicts and McBurney notes are due this week.
- Test server is up
  - Responds once a day, not all tests are shared
- TA or Instructor focuses on
  - Style and Structure, Documentation
- Search Piazza before posting
Debugging

- Decompose problem
  - put parts into Java Visualizer, for example
  - Comment out parts
- Print statements
  - Average Demo
Compound conditions

&& (AND) both sides true to be true, else false
|| (OR) either side true then true, else false
!(NOT) if true then false, and vice-versa

!(a && b) == !a || !b //is this true or false?
| a   | b   | !a  | !b  | a && b | !(a && b) | !a || !b |
|-----|-----|-----|-----|--------|-----------|----------|
| true| true| false| false| true   | false     | false    |
| false|false|true | true | false  | true      | true     |
| true|false|false|true | true   | false     | true     |
| false|true |true |false|false  |false      |true      |
| a   | b   | !a  | !b  | a && b | !(a && b) | !a || !b |
|-----|-----|-----|-----|--------|----------|---------|
| true| true| false| false| true   | false    | false   |
| true| false| false| true | false  | true     | true    |
| false| true| true | false| false  | true     | true    |
| false| false| true | true | false  | true     | true    |
Arrays - variable list, all same type

```java
int [] list;
list = new int[4];
list[0] = 99;
list[1] = 53;
System.out.println( list[0]);
// an element is at arrayName[ index]
```
What is printed?

```java
int[] numbers = {1,2,3,4,5,6,7,8,9,10};

System.out.println( "numbers[1]=" + numbers[1]);
```
Do arrays need to be initialized?

double []numbers = new double[10];

System.out.println("numbers[3]=" + numbers[3]);
Where is the error?

```java
int [] list = new int[10];
for ( int i = 0; i <= list.length; i++) {
    list[i] = i * 2;
}
System.out.println("list[5]=" + list[5]);
```
How can I print out the array?

```java
int []list = {10,2,23,64,25,16,67,18,39,10};
System.out.println( list);
```
How to find the max value?

int []list = {10,2,23,64,25,16,67,18,39,10};
Is 18 in this array?

```java
int []list = {10,2,23,64,25,16,67,18,39,10};

//linear search?
//binary search?
How to put first, last?

// and move all the others down?
int []list = {1,3,5,7,9,11,13,15,17,19};