Announcements

• ACM Programming competition
  – McKenzie lab, 12:00-5:00

• Game Night
  – Deschutes, 6:00-8:00

• Office Hours – they do occur early in the week

Errors and Lit Review

November 12, 2010

When Programming...

...things can go wrong.

Compile

Compile Time Errors

Run

Run Time Errors

Result

Logic Errors

Compile Time Errors

• Syntax: missing braces, missing semicolon,

• type mismatch

• variable not declared
Runtime Errors

- Divide by Zero
- Array Index
- Null Pointer

Program Flow: Return from Method

```
public class ProgramFlow {
    public static void main(String[] args){
        int x = 5;
        int y = 42;
        int z = computeSum(x, y);
        System.out.println("Result: "+z);
    }
    static int computeSum(int a, int b){
        return a+b;
    }
}
```

Exceptions

- For CIS 210, you should understand that an exception is how Java tells you that something went wrong at runtime.

- You will not need to handle all exceptions within the code. As you write and test your code, we expect that you will find the cause(s) and eliminate it (them).

- If you are interested in exploring exception handling, the next few slides discuss this briefly.
FileNotFoundException

```java
class MuppetMaster {
    // Configuration (Class Variables)
    static final String infile = "costumes.txt";
    static final int MAXMUPPETS = 100;
    // Internal state of MuppetMaster object (Object variables)
    Muppet[] muppets = new Muppet[MAXMUPPETS];
    int muppetCount = 0;

    /**
     * Main program instantiates the class and starts its
     * main instance method. It is also responsible for
     * obtaining a scanner on the input file.
     */
    public static void main(String[] args)
        throws FileNotFoundException {
        // Create a scanner to read the input file
        Scanner in = new Scanner( new File(infile) );
    }
}
```

Exceptions

- What can be thrown can be passed on
- What can be thrown can be caught
- Checked (example: FileNotFoundException)
- Unchecked (example: ArithmeticException)

Catch: FileNotFoundException

```java
class MuppetMaster {
    // Configuration (Class Variables)
    static final String infile = "costumes.txt";
    static final int MAXMUPPETS = 100;
    // Internal state of MuppetMaster object (Object variables)
    Muppet[] muppets = new Muppet[MAXMUPPETS];
    int muppetCount = 0;

    /**
     * Main program instantiates the class and starts its
     * main instance method. It is also responsible for
     * obtaining a scanner on the input file.
     */
    public static void main(String[] args) {
        // Create a scanner to read the input file
        Scanner in = new Scanner( new File(infile) );
    }
    try {
        // Pass the FileNotFoundException exception
        e.printStackTrace();
    }
}
```
ArithmeticException

```java
try{
    System.out.println("Int result: "+x/zeroInt);
} catch(ArithmeticException e){
    System.out.println("You cannot divide by zero");
    System.exit(0);
}
```

Double result: 0.5263157894736842
Double result: Infinity
Int result: 0
Exception in thread "main" java.lang.ArithmeticException: / by zero
at Error4.main(Error4.java:18)

Logic Errors

- Integer division truncates the result
- Conditional logic
Literature Review

• Position Paper

• Selected Sections (1-5)

• Small Group Discussion – 5 minutes

• Class Discussion