Functions

Cis 110 Summer 2017, 7/12/17

Function syntax and parts: Signature

public static returnType functionName(parameterType parameterName) {

Examples:

- `public static int countCupcakes(int[] cupcakeOrders) {`
- `public static String makeCoupleName(String name1, String name2) {`
- `public static void main(String[] args) {`

Function syntax and parts: How you gonna call?

- functionName(parameter1, parameter2, ...);
  - PennDraw.line(0, y, 1, y);
  - Math.random();
- After the function is done, you go right back to where you were
- Functions can call other functions
  - PennDraw.setPenColor((int) Math.random() * 255);

What prevents this code from compiling?

```
/*
 * does a thingy
 */
public static int[] thingy(String s, int i) {
    if (s.length() > 10) {
        i++;
        return new int[s.length()];
    } else {
        i--;
        System.out.println("thingy #" + i);
    }
}
```

Scope

- Every set of closed curly braces has its own unique “scope”, or set of personal variables
- For loops, if statements, functions, and classes all have their own scope
- Smaller scopes (sets of curly braces) have access to every scope they’re in

Function-writing exercise

- Write a function countInstancesOf to take in a char and a String, and count the number of times that char appears in the String
  - countInstancesOf(‘a’, “racecar”) should be 2
- Use that function to count the number of ‘a’s in all the command-line arguments you pass in
  - “java FunctionExercises baa baa black sheep!!” should be 5

Tracing: Walk through these examples with diagrams

- countInstancesOf(‘Q’, “KUMQUAT”)
- countInstancesOf(‘Q’, null)
- java functionExercises ancient apple queen

Challenge for the bored

- Instead of ‘a’, assume the first argument is a single character and use that
  - “java FunctionExercises 1 l love cis 110” should be 2
- Find the number of times each letter in the alphabet appears
  - “java FunctionExercises amazing words” would output something like:
    - a: 3
    - b: 0
    - c: 0
    - ...
    - z: 1