```
 1 def fib():
 2     limit = 50
 3     a = 0
 4     b = 1
 5     c = 0
 6     d = 0
 7     while c < limit:
 8         c = a + b
 9         print d, c
10         d = d + 1
11         a = b
12         b = c
13
14 fib()
```

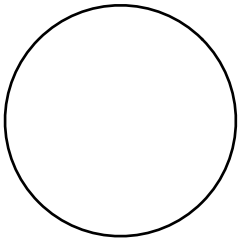
Output of this program:

d	c
0	1
1	2
2	3
3	5
4	8
5	13
6	21
7	34
8	55

```
 1 public class Exam3 {
 2     static void notfib() {
 3         int limit = 30;
 4         int a = 4;
 5         int b = 2;
 6         int c = 0;
 7         int d = 1;
 8         while (c < limit) {
 9             c = a + b;
10             System.out.println(d + " " + c);
11             d = d * 2;
12             a = b;
13             b = c;
14         }
15         System.out.println("After: " + d + " " + c);
16     }
17
18     public static void main(String[] args) {
19         notfib();
20     }
21 }
```

CSCI 1300 Exam 3
Spring 2013

Programming Concepts in Python and Java



Write Clearly!

Name: _____

9-Digit Student ID: _____

TA (circle one):

Frank Halley Jaeheon
Jing Mahnaz Don't Know

Several questions refer to the Python and Java programs containing the 'fib' and 'notfib' functions. It is stapled to the front of this exam.

1. Remove the page with the source code that is stapled to the front of the exam, and write something witty (or not) on this line: (1 point)

_____

2. (a) (2 points) If we moved Python line 14 to the top of the program, so **fib()** appears before **def fib():**, the interpreter gives us the following complaint:

NameError: name 'fib' is not defined

What does this mean?

(b) (2 points) Under which conditions will the 'while' loop on Python line 7 terminate?

(c) (2 points) Why is the last line of Python output **8 55** and not **7 34**?

_____ / 7

3. **Now look at the Java program.** It has similar structure to the Python one, but beyond syntactic differences with Python, it has several key differences. For example, the initial value of 'a' is 4.

(a) (3 points) Fill in the table to the right. Each line should have the output of line 10 as the while loop commences. Refer to the Python version's output to get a sense for what we mean. *Not all lines may be needed.* Ignore line 15 for the moment.

d	c

(b) (3 points) What does line 15 print out?

(c) (2 points) Why does the Java version need to define the class **Exam3**? (Consider what happens if we don't define a class at all?)

(d) (3 points) Can we deduce the name of the file that contains the Java program? If so, what is the file name? *Be completely accurate.*

(e) (2 points) Say we have a Java source file called **Thingy.java**, and we compile it. What is the name of the file it produces?

(f) (2 points) The Java version of the **notfib** function definition has more information that Python's **fib** definition. Specifically, it uses the word **void**. What does **void** mean in Java?

```
public class Wonderful {
    public static void main(String[] args) {
        // create an array with the given integers
        int[] input = new int[] { -3, -2, -1, 0, 1, 2 };
        int sum = 0;
        int product = 1;
        int count = 0;
        for (int i=0; i < input.length; i++) {
            sum = sum + input[i];
            product = product * input[i];
            count = count + 1;
        }
        System.out.println("Sum: " + sum);
        System.out.println("Product: " + product);
        System.out.println("Count: " + count);
    }
}
```

4. These questions relate to the **Wonderful** class above.

(a) (4 points) What does the code output?

Sum:

Product:

Count:

(b) (2 points) If we changed the initial values of sum and product to be **sum = 10;** and **product = 187238;** what would this modified code output? (Hint: this does not involve doing a lot of arithmetic.)

Sum:

Product:

Count:

(c) (1 points) After the input array is initialized, what is the *data type* of input[3]?

(d) (1 points) Similarly, what is the *value* of input[3]?