STUDY GUIDE 5: for Loops

AP Computer Science – WHS Mulvaney Name _____ Per _____

Lecture Slides	Video Lectures	Textbook Section
- 2D: Introduction to for loops - 2E: Relational Operators, Dangerous Loops, Nested Loops - 2F: Advanced for Loops	- for Loops	- 2.3

- **PracticeIt** (Building Java Programs 4th Edition, Chapter 2)
  - (2D) – Self Check: 2.21, 2.23, 2.24
  - (2E) – Self Check: 2.25, 2.26; Exercise: 2.2
  - (2F) – Self Check: 2.29, 2.31
  - Challenge Problems – Self Check 2.18; Exercise 2.3

2D Lecture Notes: Introduction to for loops

Warm Up

A. `4 + 13 % 2`

B. `13 * 5 – 7.0 / 2`

C. `12345 / 10 % 100`

D. `"3.4" + 2`

E. `76 + 12 / 5 * 4 – 3 * 5 % 2 + 8 * 5 % 5`

Task 1: For Loops Exploration

1. Create a Unit 2 Project in BlueJ. Create the ForLoopExploration class seen at the right.
   a. What is output to the console? Why does this code create that output?

```
public class ForLoopExploration {
    public static void main(String[] args) {
        for (int i = 0; i < 5; i++) {
            System.out.println("Hello");
        }
    }
}
```

   b. What part of the code would you have to change to increase or decrease the number of times the loop runs? Are there multiple ways to do this?

2. Change the statement inside the print loop to the following: `System.out.println(i);`
   a. How did the output change? What is the role of the i variable?

3. For loops are said to have four parts: body, initialization, update and test. Based on your observations, label each of the items below as one of the four for loop parts.
    a. int i = 0
    b. i < 5
    c. i++
    d. System.out.println(i);

4. Change i++ to i-- and run your code again.
    a. What kind of error has occurred? Why did it occur?

5. Go to the class workspace screen in BlueJ. Find the bouncing blue bar in the lower right hand corner. Click the arrow there to stop the infinite loop. Remember how to do this for future projects.

6. Answer the following.
    a. What would cause a loop to run zero times? Infinite times?

7. Challenge Question: change the ForLoopExploration class to look like the code on the right.
    a. What is the output? Why does the output look like that?

```
public class ForLoopExploration {
    public static void main(String[] args) {
        for (int i = 0; i < 3; i++) {
            for (int j = 0; j < 3; j++) {
                System.out.println(i + " " + j);
            }
        }
    }
}
```

For Loop Base Code	For Loop Flow Chart Diagram

2E Lecture Notes: Relational Operators, Dangerous Loops

Warm Up:
What is the output when each of the three methods is run?

```
public class TestFile
{
    public static void loopyDoo() {
        for (int i = 0; i < 3; i++) {
            System.out.println("Yo Yo Yo");
        }
    }

    public static void loopORama (){
        for (int i = 2; i < 7; i++) {
            System.out.print(i);
        }
    }

    public static void loopZilla() {
        for (int i = 5; i > -2; i--) {
            System.out.println(2*i + " shazaam " + (i - 3));

        }
    }
}
```

Vocabulary

relational operator	
Zero Loop	
Infinite Loop	
Nested for Loop	

Practice 1

What does the following print to the console?

```
for (int i = 0; i < 3; i++) {
      for (int j = 0; j <= i; j++) {
            System.out.print("?");
      }
            System.out.println();
}
```

2F Lecture Notes: Advanced for Loops

Warm Up:

```
for (int i = 1; i <= 3; i++) {
      for (int j = 1; j <= 3; j++) {
            System.out.print(i);
      }
      System.out.println();
}
```

Practice 1

```
for (int i = 1; i <= 2; i++) {
      for (int j = 1; j <= 2; j++) {
            System.out.print(“*”);
      }
      System.out.println();
}
```

Practice 2

```
// Loop 1
for (int i = 1; i < 3; i++) {
      for (int j = 0; j <= i; j++) {
            System.out.print(“*”);
      }
      System.out.println();
}

// Loop 2
for (int i = 0; i < 3; i++) {
      for (int j = i; j < 3; j++) {
            System.out.print(“*”);
      }
      System.out.println();
}
```

Practice 3

a)	b)	c)
*	1111	5432
**	222	543
***	33	54
****	4	5