**ITM 311- Class Activity 5a Looping Control Structures**

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**(1)** Predict the last line of output of the following program segment, which involves a while loop.

public class TestLoop {

public static void main(String args[]) {

int count = 1;

double balance = 1000, rate = 0.10;

System.out.println("year\t" + "balance\n");

while(count <= 3)

{

balance + = balance \* rate;

System.out.println(count + "\t$" + balance);

count++;

}

} }//end main ... end class

**Year balance**

**3 $1331.0**

**(2)** Predict the last line of output of the following program segment, which involves a while loop.

int count = 0;

int sum = 0;

while(count < 5)

{

sum + = count;

System.out.println(count + "\t" + sum);

count++;

}

**4 10**

**(3)** Predict the last line of output of the following program segment, which involves a while loop.

int count = 1;

int sum = 1;

while(count < 5) {

System.out.println(count + "\t" + sum);

count += sum;

}

**4 1**

**(4)** This program segment computes the factorial of a particular non - negative integer.

Predict the output if integer variable num equals 5 .

int fact = 1;

int count = 1;

while(count <= num)

{

fact \*= count;

count++;

}

System.out.println(num + " factorial equals " + fact);

**0 factorial equals 1**

**Looping Control Structures - The for Loop**

**(1)** A for loop is a form of a pre - test loop in that its looping condition is tested at the beginning of the loop. The general format of a for loop is:

for( initialize\_counter ; test\_condition ; update\_counter ) {

*statements* ;

}

If the condition is true, the body of the loop will be executed, otherwise the program will continue execution at the statement after the loop.

Predict the last line of output of the following program segment, which involves a for loop.

int count = 1;

for (int i = 1; i < 5; i += 2) {

count++;

System.out.println("loop iteration" + "\t" + count);

}

**loop iteration 3**

**(2)** Predict the last line of output of the following program segment, which involves a for loop.

int count = 0;

for (int i = 1; i <= 10; i += 3) {

count++;

System.out.println("loop iteration" + "\t" + count);

}

**loop iteration 4**

**(3)** Predict the last line of output of the following program segment, which involves a for loop.

int count = 0;

for (int i = 10; i >= 1; i - = 3) {

count++;

System.out.println("loop iteration" + "\t" + count);

}

**loop iteration 4**

**(4)** Use the space below to construct a for loop that sums all the numbers given below.

4 , 8 , 16 , 32 , 64 , 128 , 256 , 512 , 1024

**for (int i = 2; i <= 512; i = i\*2){**

**System.out.print(i\*2 + “,”);**

**}**

**(5)** In June of 2016 , James puts $ 2,048 into a savings account and, each month thereafter, plans to deposit only half of what he saved in the previous month.

Use a single for loop to write a program that can be used to determine how much will

he have deposited into his account by the end of April 2017 . Place your code and a

snapshot of your output below.

**Source Code:**

public class Deposit {

public static void main(String args[]){

int count = 2048;

int total = 2048;

int i;

for(i = 2; i <= 11; i++){

count = count / 2;

total = total + count;

}

System.out.println("Balance as of April 2017: " + total);

}

}

**Output:**

