**Computer Science II**

1. Show the exact output produced by the following main() routine:

public static void main(String[] args) {

int x,y;

x = 5;

y = 1;

while (x > 0) {

x = x - 1;

y = y \* x;

System.out.println(y);

}

}

1. Write a for loop that will print out all the multiples of 3 from 3 to 36, that is: 3 6 9 12 15 18 21 24 27 30 33 36.

public class Two {  
 public static void main(String[] args){  
 int x;  
 x = 3;  
  
 while (x < 36){  
 x= x+3;  
   
   
 System.out.println(x);  
  
 }  
   
 }  
  
}

1. What output is produced by the following? (3 Points)

int a = 1, b = 10, c = 10, d = 10;

switch(b = a++ % 3)

{

case 1:

case 0: c = --a / ++b ;

case 2: d = (a==b)? a++ : --b; break;

default: d++;

}

System.out.println(a);

System.out.println(b);

System.out.println(c);

System.out.println(d);

1. Draw a UML diagram for the following classes. (3 Points)

public class FlipRace

{

//-----------------------------------------------------------------

// Flips two coins until one of them comes up heads three times

// in a row.

//-----------------------------------------------------------------

public static void main (String[] args)

{

final int GOAL = 3;

int count1 = 0, count2 = 0;

// Create two separate coin objects

Coin coin1 = new Coin();

Coin coin2 = new Coin();

while (count1 < GOAL && count2 < GOAL)

{

coin1.flip();

coin2.flip();

// Print the flip results

System.out.print ("Coin 1: " + coin1);

System.out.println (" Coin 2: " + coin2);

// Increment or reset the counters

count1 = (coin1.isHeads()) ? count1+1 : 0;

count2 = (coin2.isHeads()) ? count2+1 : 0;

}

// Determine the winner

if (count1 < GOAL)

System.out.println ("Coin 2 Wins!");

else

if (count2 < GOAL)

System.out.println ("Coin 1 Wins!");

else

System.out.println ("It's a TIE!");

}

}

public class Coin

{

private final int HEADS = 0;

private final int TAILS = 1;

private int face;

//-----------------------------------------------------------------

// Sets up the coin by flipping it initially.

//-----------------------------------------------------------------

public Coin ()

{

flip();

}

//-----------------------------------------------------------------

// Flips the coin by randomly choosing a face value.

//-----------------------------------------------------------------

public void flip ()

{

face = (int) (Math.random() \* 2);

}

//-----------------------------------------------------------------

// Returns true if the current face of the coin is heads.

//-----------------------------------------------------------------

public boolean isHeads ()

{

return (face == HEADS);

}

//-----------------------------------------------------------------

// Returns the current face of the coin as a string.

//-----------------------------------------------------------------

public String toString()

{

String faceName;

if (face == HEADS)

faceName = "Heads";

else

faceName = "Tails";

return faceName;

}

}

1. Design and implement a class called Bulb that represents a light bulb that can be turned on and off. This class needs to have methods for turning the bulb on and off, and checking the bulb is on or off. (4 Points)