Due Sunday, Oct 14th.

1) Write a program that reads an integer value representing SECONDS. The program should then find how many weeks, days, hours, minutes and seconds that number represents

Output example:

184057 seconds equals 0 weeks,
2 days,
3 hours,
7 minutes
and 37 seconds

Solution:

```java
// Student name
// Student Id
// Assignment #4 Question #1
// 141/51 Computer Programming I
// Due date: October 14, 2012
// Program that enters a number of seconds and computes the number of
// weeks, days, hours, minutes and seconds

import java.util.Scanner;

public class Assign4Quest1 {
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);

        int seconds; // stores the number of seconds
        int weeks;  // stores the number of weeks in the given seconds
        int days;  // stores the number of days in the given seconds
        int hours; // stores the number of hours in the given seconds
        int mins;  // stores the number of minutes in the given seconds
        int sec;  // stores the number of remaining seconds

        System.out.print("Enter the number of seconds: ");
        seconds = input.nextInt();
        sec = seconds;

        weeks = sec/(7*24*60*60); // divide by the number of seconds in a week
        sec%= 7*24*60*60; // find the remaining seconds after division
        days = sec/(24*60*60); // divide by the number of seconds in a day
        sec%= 24*60*60; // find the remaining seconds after division
        hours = sec/(60*60); // divide by the number of seconds in an hour
        sec%= 60*60; // find the remaining seconds after division
        mins = sec/60; // divide the number of seconds in a minute
        sec%= 60; // find the remaining seconds after division

        System.out.printf("%d seconds equals %d weeks,\n", seconds, weeks);
        System.out.printf("%d days,\n", days);
        System.out.printf("%d hours,\n", hours);
        System.out.printf("%d minutes\n", mins);
        System.out.printf("%d and %d seconds\n", sec);
    }
}
```
2) Write a program that computes the area of a circle or triangle, based on the choice of the user.

**Solution Version A:**

```java
// Student name
// Student Id
// Assignment #4 Question #2 Part A
// 141/51 Computer Programming I
// Due date: October 14, 2012
// Program that enters a string representing the users choice of triangle
// or circle, then, according to the choice, computes and prints the area

import java.util.Scanner;

public class Assign4Quest2 {
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);

        String choice; // stores the choice of circle or triangle from the user
        System.out.print("Enter 'C' for circle or 'T' for triangle: ");
        choice = input.next();

        if (choice.compareToIgnoreCase("C") == 0) {
            double r; // stores the radius of the circle
            System.out.print("Enter the radius of the circle: ");
            r = input.nextDouble();
            System.out.printf("The area of the circle with radius %f is %f\n", r, Math.PI*r*r);
        }
        else if (choice.compareToIgnoreCase("T") == 0) {
            double base; // stores the base of the triangle
            double height; // stores the height of the triangle
            System.out.print("Enter the base and height of the triangle: ");
            base = input.nextDouble();
            height = input.nextDouble();
            System.out.printf("The area of the triangle with base %f", base);
            System.out.printf(" and height %f is %f\n", height, 0.5*base*height);
        }
        else
            System.out.println("Incorrect input!!! You must enter 'C' or 'T'!!");
    }
}
```
import java.util.Scanner;

public class Assign4Quest2B {
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        String choice; // stores the choice of circle or triangle from the user
        char ch; // stores the choice of the user after converting to string
        System.out.print("Enter 'C' for circle or 'T' for triangle: ");
        choice = input.next();
        ch = choice.charAt(0);
        if ((ch == 'C') || (ch == 'c')){
            double r; // stores the radius of the circle
            System.out.print("Enter the radius of the circle: ");
            r = input.nextDouble();
            System.out.printf("The area of the circle with radius %f is %f\n", r, Math.PI*r*r);
        }
        else if ((ch == 'T') || (ch == 't')){
            double base; // stores the base of the triangle
            double height; // stores the height of the triangle
            System.out.print("Enter the base and height of the triangle: ");
            base = input.nextDouble();
            height = input.nextDouble();
            System.out.printf("The area of the triangle with base %f", base);
            System.out.printf(" and height %f is %f\n", height, 0.5*base*height);
        }
        else
            System.out.println("Incorrect input!!! You must enter 'C' or 'T'!!");
    }
}
3) Write a program that reads \( x_1, y_1, x_2, y_2 \) (2 points) and find the slope of the line that passes through these 2 points. Use the formula

\[
s = \frac{y_2 - y_1}{x_2 - x_1}
\]

to determine the slope. If \( x_1 = x_2 \), the line is vertical and the slope is undefined. The program should output the slope with an appropriate label, if the slope is undefined, it should give a suitable message.

Solution:

```java
// Student name
// Student Id
// Assignment #4 Question #3
// 141/51 Computer Programming I
// Due date: October 14, 2012
// Program that enters the coordinates for two points then prints the slope

import java.util.Scanner;

public class Assign4Quest3 {
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        int x1; // stores the x coordinate of the first point
        int y1; // stores the y coordinate of the first point
        int x2; // stores the x coordinate of the second point
        int y2; // stores the y coordinate of the second point
        //double slope; // stores the slope of the line

        System.out.print("Enter the x and y coordinates of the first point: ");
        x1 = input.nextInt();
        y1 = input.nextInt();
        System.out.print("Enter the x and y coordinates of the second point: ");
        x2 = input.nextInt();
        y2 = input.nextInt();

        if (x1 == x2)
            System.out.println("The line is vertical and the slope is undefined");
        else {
            System.out.printf("The slope for line passing through (%d,%d), ", x1, y1);
            System.out.printf("%d,%d) is %f\n", x2, y2, (float)((y2-y1)/(x2-x1)));
        }
    }
}
```
4) Write a program with the exact following output:

```
I need a "Super" Computer
and a \smart/ robot
```

Solution:

```java
public class Assign4Quest4 {
    public static void main(String[] args) {
        System.out.println("I need a "Super" computer
        and a \smart/ robot
    }
}
```

5) Find the result of these JAVA expressions:

<table>
<thead>
<tr>
<th>Expression</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>11 - 1.0 / 4</td>
<td>10.75</td>
</tr>
<tr>
<td>20/6*3</td>
<td>15</td>
</tr>
<tr>
<td>27 % 7 + 2.5</td>
<td>9</td>
</tr>
<tr>
<td>8 / (4 - 2) / 8</td>
<td>0</td>
</tr>
<tr>
<td>(0.5 + 1.5) / 4</td>
<td>0.5</td>
</tr>
<tr>
<td>30 / 4 % 9</td>
<td>6</td>
</tr>
<tr>
<td>8 / 2 + 2</td>
<td>6</td>
</tr>
<tr>
<td>22 % 5 + 13 / 2</td>
<td>6</td>
</tr>
<tr>
<td>15 / (4 + 2.0)</td>
<td>2.5</td>
</tr>
<tr>
<td>6 + 10 % 5 * 2</td>
<td>8</td>
</tr>
<tr>
<td>15/6.0 = 2.5</td>
<td>2.5</td>
</tr>
<tr>
<td>15/(4 + 2.0)</td>
<td>2.5</td>
</tr>
</tbody>
</table>

Solution:

```java
public class Assign4Quest5 {
    public static void main(String[] args) {
        System.out.println("11 - 1.0/4 = 11 - 0.25 = 10.75
        20/6*3 = 15
        27 % 7 + 2.5 = 9
        8/(4 - 2)/8 = 8/2/8 = 4/8 = 0
        (0.5 + 1.5) / 4 = 2.0/4 = 0.5
        30 / 4 % 9 = 7 % 9 = 7
        8/2 + 2 = 4 + 2 = 6
        27 % 7 + 2.5 = 6 + 2.5 = 8.5
        22 % 5 + 13/2 = 2 + 13/2 = 2 + 6 = 8
        15/(4 + 2.0) = 15/6.0 = 2.5
        6 + 10 % 5 * 2 = 6 + 0 * 2 = 6 + 0 = 6
    }
}
```
6) Write a program that reads an integer (between 100 and 999) and finds and displays the result of multiplying all of its digits.

**Solution:**

```java
public class Assign4Quest6 {
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        int num; // stores the number entered by the user
        int ones; // stores the ones digit
        int tens; // stores the tens digit
        int hunds; // stores the hundreds digit

        System.out.print("Enter a three digit number: ");
        num = input.nextInt();

        if ((num >= 100) && (num <= 999)) {
            ones = num % 10;
            tens = (num / 10) % 10;
            hunds = num / 100;

            System.out.printf("The product of the digits %d, %d and %d is %d\n", hunds, tens, ones, (hunds * tens * ones));
        } else
            System.out.println("The number you entered is not three digits!!");
    }
}
```

7) Find the output in these four cases:

```java
if (x > 3) if (y < 8) System.out.print("abc"); System.out.print("xyz"); if (x != 10) {System.out.print("123"); } else System.out.print("789");
```

<table>
<thead>
<tr>
<th>Value of x</th>
<th>Value of y</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

**Solution:**

```java
/* Value of x Value of y Output
 * 12 15 xyz123
 * 8 4 abcxyz123
 * 10 10 xyz789
 * 1 5 xyz123 */
```
8) Trace and find the output:

```java
public class Quiz{
    private int num1;
    private int num2;

    public Quiz (int n1, int n2){
        num1 = n1+1;
        num2= n2-1;
    }

    public void a ( ) {
        if (num1>num2){
            if (num1%2==0)
                num1= num1+num2;
            num2= num2-1;
        }else
            num1=num1+2;
        num2=num2*2;
    }

    public void display ( ) {
        System.out.printf("num1=%d num2=%d\n",num1,num2);
    }
}

public class QuizTest{
    public static void main(String[ ] args){
        Quiz x = new Quiz(3,3);
        Quiz y = new Quiz(1,8);
        x.a( );
        y.a( );
        x.display( );
        y.display( );
    }
}

Solution:
//Student name
//Student Id
//Assignment #4 Question #8
//141/51 Computer Programming I
//Due date: October 14, 2012
//Find the output of the given program

/**********************************************************/
/*  x:
*    num1 = 4 + 2 = 6
*    num2 = 2 - 1 = 1 * 2 = 2
*  */
/*  y:
*    num1 = 2 + 2 = 4
*    num2 = 7 * 2 = 14
*  */
/* OUTPUT
*  ======
*  num1=6 num2=2
*  num1=4 num2=14
*/
/**********************************************************/```