CSE 142 Sample Midterm Exam #1 Key

Also check out Practice-It to test solving these problems or to type in your own solution to see if it works!

1. Expressions

<table>
<thead>
<tr>
<th>Expression</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 * 4 + 5 * 6 + 7 * -2</td>
<td>28</td>
</tr>
<tr>
<td>1.5 * 2.0 + (5.5 / 2) + 5 / 4</td>
<td>6.75</td>
</tr>
<tr>
<td>23 % 5 + 31 / 4 % 3 - 17 % (16 % 10)</td>
<td>-1</td>
</tr>
<tr>
<td>&quot;1&quot; + 2 + 3 + &quot;4&quot; + 5 * 6 + &quot;7&quot; + (8 + 9)</td>
<td>&quot;123430717&quot;</td>
</tr>
<tr>
<td>345 / 10 / 3 * 55 / 5 / 6 + 10 / (5 / 2.0)</td>
<td>24.0</td>
</tr>
<tr>
<td>1 / 2 &gt; 0</td>
<td></td>
</tr>
</tbody>
</table>

2. Parameter Mystery

tyler and tv like java
java and tyler like tv
tv and donnie like rugby
hamburger and x like tyler
tyler and java like tyler

3. If/Else Simulation

<table>
<thead>
<tr>
<th>Method Call</th>
<th>Value Returned</th>
</tr>
</thead>
<tbody>
<tr>
<td>mystery(4, 2)</td>
<td>4</td>
</tr>
<tr>
<td>mystery(5, 4)</td>
<td>5</td>
</tr>
<tr>
<td>mystery(5, 13)</td>
<td>15</td>
</tr>
<tr>
<td>mystery(5, 17)</td>
<td>20</td>
</tr>
<tr>
<td>mystery(4, 8)</td>
<td>8</td>
</tr>
</tbody>
</table>

4. While Loop Simulation

<table>
<thead>
<tr>
<th>Method Call</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>mystery(5, 0);</td>
<td>5</td>
</tr>
<tr>
<td>mystery(3, 2);</td>
<td>1 0 1</td>
</tr>
<tr>
<td>mystery(16, 5);</td>
<td>3 2 1 0 1</td>
</tr>
<tr>
<td>mystery(80, 9);</td>
<td>8 4 2 1 2 0 2</td>
</tr>
<tr>
<td>mystery(1600, 40);</td>
<td>40 19 2 9 0 4 0</td>
</tr>
</tbody>
</table>

5. Assertions

<table>
<thead>
<tr>
<th></th>
<th>y &gt; x</th>
<th>z &lt; 0</th>
<th>z &gt; 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Point A</td>
<td>SOMETHES</td>
<td>NEVER</td>
<td>NEVER</td>
</tr>
<tr>
<td>Point B</td>
<td>NEVER</td>
<td>NEVER</td>
<td>ALWAYS</td>
</tr>
<tr>
<td>Point C</td>
<td>NEVER</td>
<td>NEVER</td>
<td>SOMETHES</td>
</tr>
<tr>
<td>Point D</td>
<td>ALWAYS</td>
<td>NEVER</td>
<td>SOMETHES</td>
</tr>
<tr>
<td>Point E</td>
<td>ALWAYS</td>
<td>SOMETHES</td>
<td>SOMETHES</td>
</tr>
</tbody>
</table>
6. Programming (five solutions shown)

```java
public static boolean hasMidpoint(int a, int b, int c) {
    double mid = (a + b + c) / 3.0;
    if (a == mid || b == mid || c == mid) {
        return true;
    } else {
        return false;
    }
}

public static boolean hasMidpoint(int a, int b, int c) {
    double mid = (a + b + c) / 3.0;
    return (a == mid || b == mid || c == mid);
}

public static boolean hasMidpoint(int a, int b, int c) {
    return (a == (b + c) / 2.0 || b == (a + c) / 2.0 || c == (a + b) / 2.0);
}

public static boolean hasMidpoint(int a, int b, int c) {
    int max = Math.max(a, Math.max(b, c));
    int min = Math.min(a, Math.min(b, c));
    double mid = (max + min) / 2.0;
    return (a == mid || b == mid || c == mid);
}

public static boolean hasMidpoint(int a, int b, int c) {
    return (a - b == b - c || b - a == a - c || a - c == c - b);
}
```

7. Programming (one solution shown)

```java
public static void sequenceSum(double limit) {
    if (limit >= 1) {
        System.out.print("1");
        int denominator = 1;
        double sum = 1.0;
        while (sum < limit) {
            denominator++;
            sum += 1.0 / denominator;
            System.out.print(" + 1/" + denominator);
        }
        System.out.printf(" = %.3f\n", sum);
    }
}
```
8. Programming (three solutions shown)

```java
public static void favoriteLetter(Scanner console, String letter) {
    System.out.println("Looking for two " + letter + " words in a row.");
    int count = 0;
    String word = "";
    while (count < 2) {
        System.out.print("Type a word: ");
        word = console.next();
        if (word.startsWith(letter)) {
            count++;
        } else {
            count = 0;
        }
    }
    System.out.println("" + letter + " is for " + word + "");
}

// uses two Strings instead of count, and uses forever/break loop
public static void favoriteLetter(Scanner console, String letter) {
    System.out.println("Looking for two " + letter + " words in a row.");
    System.out.print("Type a word: ");
    String word1 = console.next();
    System.out.print("Type a word: ");
    String word2 = console.next();
    while (!(word1.startsWith(letter) && word2.startsWith(letter))) {
        word1 = word2;
        System.out.print("Type a word: ");
        word2 = console.next();
    }
    System.out.println("" + letter + " is for " + word2 + "");
}

// uses do/while loop
public static void favoriteLetter(Scanner console, String letter) {
    System.out.println("Looking for two " + letter + " words in a row.");
    int count = 0;
    String word;
    do {
        System.out.print("Type a word: ");
        word = console.next();
        if (word.startsWith(letter)) {
            count++;
        } else {
            count = 0;
        }
    } while (count < 2);
    System.out.println("" + letter + " is for " + word + "");
}
```