CS170 Section 000 - Homework 2 Solutions

1) (2 pts each) 16pts
Suppose you have the following declarations:
boolean found = true;
boolean flag = false;
double x = 5.2;
double y = 3.4;
int a = 5, b = 8;
int n = 20;
char ch = ‘B’;

<table>
<thead>
<tr>
<th>Expression</th>
<th>Evaluates to</th>
</tr>
</thead>
<tbody>
<tr>
<td>!found</td>
<td>false</td>
</tr>
<tr>
<td>x &gt; 4.0</td>
<td>true</td>
</tr>
<tr>
<td>!found &amp;&amp; (x &gt;= 0)</td>
<td>false</td>
</tr>
<tr>
<td>!(found &amp;&amp; (x &gt;= 0))</td>
<td>false</td>
</tr>
<tr>
<td>x + y &lt;= 20.5</td>
<td>true</td>
</tr>
<tr>
<td>(n &gt;= 0) &amp;&amp; (n &lt;= 100)</td>
<td>true</td>
</tr>
<tr>
<td>(‘A’ &lt;= ch &amp;&amp; ch &lt;= ‘Z’)</td>
<td>true</td>
</tr>
<tr>
<td>(a + 2 &lt;= b) &amp;&amp; !flag</td>
<td>true</td>
</tr>
</tbody>
</table>

2) (2 pts each) 8pts

<table>
<thead>
<tr>
<th>Statement</th>
<th>Output of Statement</th>
</tr>
</thead>
</table>
| If (6 < 2 * 5) 
  System.out.print("Hello"); 
  System.out.print("There"); | Hello There |
| If (‘a’ > ‘b’) || 66 > (int) (‘A’) 
  System.out.println("yes"); 
  Else 
  System.out.println("no"); | yes |
| If (7 <= 7) 
  System.out.println(6 - 9 * 2 / 6); | 0 |
| If (5 < 3) 
  If (7 == 8) 
    System.out.println("&"); 
  Else 
    System.out.println("%"); | There should be no output |
3) 5pts
Rewrite the entire set of statements below using curly braces in two different ways such that the “else” block belongs to (1) the inner if block of “if (a == c)” and (2) it belongs to the outer if block “if (a < b).

```java
if (a < b)
if (a == c)
    System.out.println("yes");
else
    System.out.println("no");

Answer 1 (2.5pts):
if (a < b) {
    if (a == c) {
        System.out.println("yes");
    } else {
        System.out.println("no");
    }
}
Answer 2 (2.5pts):
if (a < b) {
    if (a == c) {
        System.out.println("yes");
    }
} else {
    System.out.println("no");
}
```

4) 6 pts
Suppose x = 5, what is the output of the following set of statements?
```java
int x = 5;
if (x++ < 6)
    if (++x > 5)
        if (++x >=9)
            System.out.println("1: + (x % 2 == 0 ? "yes": "no")");
        else
            System.out.println("2: + (x % 2 == 0 ? "yes": "no")");
    else
        System.out.println("3: + (x % 2 == 0 ? "yes": "no")");
else
    System.out.println("4: + (x % 2 == 0 ? "yes": "no")");
```

Answer:
2: yes
4) 5 pts
Suppose \( \alpha = 4 \), what is the output of the following set of statements?

```java
int alpha = 4;
switch (alpha) {
    case 1:
    case 2:
        alpha = alpha + 2;
        break;
    case 4:
        alpha++;
    case 5:
        alpha = 2 * alpha;
        break;
    case 6:
        alpha = alpha + 5;
        break;
    default:
        alpha--;
}
System.out.println(alpha);
```

Answer: 10

5) 10 pts
Rewrite the following code to use one “if” statement with two “else if (...)” statements followed by an “else” statement.

```java
if (balance >= 50000.00)
    interestRate = 0.07;
else
    if (balance >= 25000.00)
        interestRate = 0.05;
    else
        if (balance >= 1000.00)
            interestRate = 0.03;
        else
            interestRate = 0.00;
```

Answer:

```java
if (balance >= 50000.00)
    interestRate = 0.07;
else if (balance >= 25000.00)
    interestRate = 0.05;
else if (balance >= 1000.00)
    interestRate = 0.03;
else
    interestRate = 0.00;
```