CISC 110 Test 2 Example Questions

1. a) Evaluate the following expressions. For each expression, give both its value and data type. The solution for the first expression is given as an example.

Assume the following variable declarations:

```javascript
var num = 5;
var val = 3;
```

<table>
<thead>
<tr>
<th>Expression</th>
<th>Value</th>
<th>Data Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 * 3 + 6</td>
<td>21</td>
<td>int</td>
</tr>
<tr>
<td>!(val &lt; num &amp;&amp; val != 3)</td>
<td>True</td>
<td>Boolean</td>
</tr>
<tr>
<td>Math.round(num / 2) * 1.5</td>
<td>4.5</td>
<td>Number</td>
</tr>
</tbody>
</table>

b) Form expressions that correspond to the following descriptions, and write the expression in the box next to the description. The first two are completed as examples.

| True if int variables a and b, are greater than zero and a is also less than b | \((a > 0) && (b > 0) && (a < b)\) |
| For 3 int variables, a, b, and c, the result value is the quotient of the sum of a and b divided by c | \((a + b) / c\) |
| False if an int variable, a, has a value between 0 and 5, inclusive | \!(a>=0 \text{ and } a<=5)\ |
| True if an int variable, a, is evenly divisible by b, but is not evenly divisible by c | \((a \% b == 0) \&\& (a \% c !=0)\) |
2. Write ActionScript code that uses the Math.random and Math.round methods to simulate rolling a 6-sided die. It randomly generates a number between 1 and 6 and sets an integer variable called die1 to that value.

```actionscript
die1 = Math.round(Math.random() * 5 + 1);
```

3. Write a while loop that rolls a pair of dice \( n \) times and counts how many of the pairs are two of a kind, i.e., the same value. For example, if when the dice are rolled, the two dice are a 5 and a 5, that’s two of a kind; if the two dice rolled are a 5 and a 3, that is not two of a kind.

Display the results in the output window via a trace statement. Use your answer from the last question for rolling the dice. Assume that \( n \) is an integer variable that has already been given a positive value, which could be any positive integer.

```actionscript
var die1:int;
var die2: int;
var numEqual: = 0;
var i = 1;

while (i<=n)
{
    die1 = Math.round(Math.random()* 5 +1);
    die2 = Math.round(Math.random()* 5 +1);

    if(die1 == die2)
    {
        numEqual++;
    }

    i++;
}

Trace("The number of 3 of a kind is: "+ numEqual);
```
4. Assume you are implementing a poker game that includes a tutorial section on how to analyze the value of poker hands and their likelihood of occurring. Part of the implementation of that tutorial will require writing a while loop to calculate the value \( n! \) (n factorial). The formula for \( n! \) is:

\[
0! = 1 \\
n! = (n)(n-1)(n-2)(n-3) \ldots (3)(2)(1)
\]

For example, \( 4! = (4)(3)(2)(1) = 24 \), so if \( n = 4 \), your while loop would calculate 24.

Assume that an int variable, \( n \), already has a value and is greater than or equal to 0.

```javascript
var num = 2;
var nFactorial = 1;

while(num <= n)
{
    nFactorial = nFactorial * num;
    num ++;
}
```

5. Below is an array of the names of all the players in a game, arranges according to their ranks, with the first-place player in the first position in the array, the second-placed player in the second position, etc.

```javascript
```

a) Use a statement to add "Franz", the loser, to the end of the list.

```javascript
playerList.push("Franz");
```

b) Write a for loop to display each player's name and rank in the output window.

```javascript
for(var i = 0; i<playerList.length; i++)
{
    trace("Player name: ") + playerList[i] + "Player rank: " + i);
}
```
c) Assume that a player’s name has been read into a variable from an input text field. Write a for loop that finds the player in the array and displays their rank in the output window. Note: don’t forget to consider the situation where the player’s name does not exist in the array!

```javascript
var outputString = "Player does not exist!";

for(var i = 0; i<playerList.length; i++)
{
    if(playerList[i] == inputName)
    {
        outputString = "Player rank is" + String(i);
    }
}

trace(outputString);
```

6. Create an array filled with 5 words. Write a loop that goes through your array and displays each word at odd numbered indices (starting from 1) in the output window. Do this using if/else branching.
(BONUS): Write a while loop that goes through your array and displays each word only once and at random. Note: this question would never appear on a test, but it is good practice for learning how to think like a programmer!