CS302 No If Ands Or Buts

The goal of this exercise is to practice using boolean operators as well as if and switch statements.

1.) Heads or Tails

Write a code fragment that displays “heads” or “tails” depending on the state of a coin object.

Given:

```java
class Coin {
    private boolean state;
    public Coin () { ... }
    // flip() - does a randomized flip of the coin
    public void flip() { ... }
    // isHeads returns true if the current state is heads and false otherwise
    public boolean isHeads() { ... }
}
```

Complete the code fragment given:

```java
Coin coin = new Coin();
coin.flip();
if ( coin.isHeads() )
    System.out.println("heads");
else
    System.out.println("tails");
```

2.) On Vacation

Trace the code fragment shown above for each combination of vacation activities and complete the table showing the grade received.

Given:

```java
class Vacation {
    public Vacation() { ... }
    public static boolean willStudy() { ... }
    public static boolean getSleep() { ... }
}
```

```java
int grade = 100;
if ( Vacation.willStudy() )
    if ( Vacation.getSleep() )
        grade = grade - 5;
    else
        grade = grade - 75;
```

Trace the code fragment shown above for each combination of vacation activities and complete the table showing the grade received.

<table>
<thead>
<tr>
<th>willStudy()</th>
<th>getSleep()</th>
<th>grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>true</td>
<td>true</td>
<td>95</td>
</tr>
<tr>
<td>true</td>
<td>false</td>
<td>25</td>
</tr>
<tr>
<td>false</td>
<td>true</td>
<td>100</td>
</tr>
<tr>
<td>false</td>
<td>false</td>
<td>100</td>
</tr>
</tbody>
</table>
3.) Politics

Given:
```java
class Gallop {
    public static final int BUCHANAN = 0; // Independent
    public static final int GORE = 1; // Democrat
    public static final int BUSH = 2; // Republican
    public static final int NADER = 3; // Independent
    
    public int pollVoters() { ... } // returns winner’s number
}
```

(a) Write an if statement that prints “Democrat Wins”, “Republican Wins”, “Independent Wins”, or “Other Wins” based on the results of the Gallop poll.

```java
int president = Gallop.pollVoters();
if (president == Gallop.GORE) {
    System.out.println("Democrat Wins");
} else if (president == Gallop.BUSH) {
    System.out.println("Republican Wins");
} else if (president == Gallop.BUCHANAN || president == Gallop.NADER) {
    System.out.println("Independent Wins");
} else {
    System.out.println("Other Wins");
}
```

(b) Rewrite the code fragment above using a switch statement.

```java
int president = Gallop.pollVoters();
switch (president) {
    case Gallop.GORE:
        System.out.println("Democrat Wins");
        break;
    case Gallop.BUSH:
        System.out.println("Republican Wins");
        break;
    case Gallop.BUCHANAN:
    case Gallop.NADER:
```
System.out.println(“Independent Wins”);
break;
default:
    System.out.println(“Other Wins”);
}
4.) Divide By Zero (or not?)

Write a single if-else statement that divides someNumber by divisor if and only if the divisor is not zero. Your expression should return true only if the result of the division is 11.

```java
if ( divisor != 0 && someNumber/divisor == 11 )
    return true;
else
    return false;
```

5.) Your Input is Requested

Assume: a MainWindow (mw) and InputBox (in) already exist for your use:
```
if (in.getInteger("Enter 1st digit") == 3 && in.getInteger("Enter 2nd digit") == 9 &&
in.getInteger("Enter 3rd digit") == 1 && in.getInteger("Enter 4th digit") == 7 )
```

Trace the above code and record how many digits are requested and the final value of the conditional expression, if the combination you try is:

(a) 7592 ______ 1 ______ false
(b) 3976 ______ 3 ______ false
(c) 3914 ______ 4 ______ false
(d) 4917 ______ 1 ______ false
(e) 3917 ______ 4 ______ true