In this quiz we asked you to study some code and then answer some questions.

The intended functionality of the code is described in the comment block.

```
/* This method should compute the cost of a computer, as follows:
 * memory costs $10 per GB
 * processor costs $200 plus $50 for each GHz in speed
 * computer costs $500 plus memory cost plus processor cost
 */
```

This is what the code is supposed to do. The code given is incorrect. Your job is to explain what the bug is and try to fix it.

```
public int priceComputation(int memoryInGB, int processorSpeedInGHz) {
      int memoryCost = memoryInGB * 10;
      int processorCost = processorSpeedInGHz * 50;
      int computerCost = 500 + memoryCost + processorCost;
      return computerCost;
}
```

QUESTION 1: *priceComputation(3,2) should return 830. What does priceComputation(3,2) return?*

To solve this question we simulate calling the method with arguments 3 and 2.

To trace the execution of the method we start by assigning the parameters of the method, `memoryInGB` and `processorSpeedInGHz`, the corresponding argument values, 3 and 2. The parameters are given in the method header:

```
public int priceComputation(int memoryInGB, int processorSpeedInGHz)
```

Next, we carry out the instrutions inside the body of the method,

```
int memoryCost = memoryInGB * 10;
int processorCost = processorSpeedInGHz * 50;
int computerCost = 500 + memoryCost + processorCost;
return computerCost;
```

in the order given. First we evaluate the expression

```
memoryInGB * 10
```

Since the value of `memoryInGB` is 3, the expression has value 30. This value is assigned to the variable `memoryCost.`

Second we evaluate the expression

```
processorSpeedInGHz * 50
```

Since the value of `processorSpeedInGHz` is 2, the expression has value 100. This value is assigned to the variable `processorCost.`

Third we evaluate the expression

```
500 + memoryCost + processorCost
```

Since the value of `memoryCost` is 30 and the value of `processorCost` is 100, the expression has value 500 + 30 + 100 = 630. This value is assigned to the variable `computerCost,` and is the value returned by the method.

The answer to question 1 is therefore 630.

QUESTION 2: *In your own words, what is the error (or "bug") in the code?*

If we compare the specification for the method (the text in the comment block) and compare it to what the code actually computes, we can see a discrepancy. The specifications say,

```
processor costs $200 plus $50 for each GHz in speed
```

but the code computes,

```
int processorCost = processorSpeedInGHz * 50;
```

It looks like the code neglects to add in the $200 base charge. If we compare the expected answer, 830, to the actual answer that we got in question 1, 630, we see that there is a difference of exactly 200.

The “bug”, therefore, is that the computation of the processor cost has been implemented incorrectly.

QUESTION 3: *Fix the bug: rewrite the code so that it produces the correct result.*

To fix the bug we make sure that 200 is added to the cost of the processor, highlighted in red:

```
public int priceComputation(int memoryInGB, int processorSpeedInGHz) {
      int memoryCost = memoryInGB * 10;
      int processorCost = 200 + processorSpeedInGHz * 50;
      int computerCost = 500 + memoryCost + processorCost;
      return computerCost;
}
```