

Unit 05 Quiz – FRQ – Corrections

1. If there is an answer box, answer with the appropriate word or phrase. If there are lines below the question, answer each in complete sentences with proper grammar. Points will be given for neatness. Use the number of lines given to estimate the relative length of the answer required.

- a) If `numStudents` were changed to be a `public` field, how would the test code need to change so that it would continue to run with the same output? Explain why.

- b) If the `static` modifier were to be removed from the definition of method `getNumStudents`, how would the code need to change in order to continue to run and to be able to output the number of students?

- c) The class as written has no mutator method for `name` or `birthYear`. How are these fields initialized and how can they be subsequently modified?

- d) The **class declaration** is the first line of the class definition. Write the correct class definition for this quiz.

- e) A **field** is a variable defined at the top level within a class. Write the proper declaration of the field `name` of type `String` as specified in the quiz. This field should not be able to be accessed from outside the class.

- f) What word from the statement in (e) makes the field inaccessible from outside the class?

- g) An additional requirement for the `Student` class is that it maintains the maximum GPA from all the students. This only requires one value for the entire class. Write the definition of the field `maxGpa` that satisfies these requirements. Ensure it is `private`, and explicitly initialize its value to zero.

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- h) What word from the statement in (g) makes the definition create only one value for the class rather than one value per instance of the class?

- i) Write the correct method header for the three-parameter constructor

- j) Write the correct method header for the two-parameter constructor

- k) For the `Student` class, what is the type of variable returned by the constructor?

- l) To keep track of the number of students, we created the field `numStudents` that included the modifier `static` so that there is only one value for all instances of the class. Where do we need to increment the value of `numStudents` so that it keeps track of the number of instances of class `Student`?

- m) When setting a field in a constructor, it is common to see a statement similar to `this.gpa = gpa;`. Describe when and why statements like this example require the keyword `this`.

- n) A programmer wishes to include the student's school, so updates the `toString` method to take the school name as a parameter: `public String toString(String school)`. They then update the method to include the school name in the returned `String`. However, the test code no longer outputs any of the information about the student. Describe the reason why.

- o) On a separate piece of paper, write a corrected version of the `Student` class.