
Intellectuals solve problems; geniuses prevent them. —Albert Einstein

PLEASE PRINT ALL PARTICIPANT NAMES ON TOP OF THE PAGE

Class, Section and Group# _____

Total Points (Out of 100 points) _____

Instruction:

1. Answer to the problem on a **PDF file (PDF file only)** and save it as HW#_YOUR-TEAM#.PDF
 2. Submit the **PDF** file to eLearning before the due date
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1. (54 points) **JUnit testing for facts**

- A. (36 points) Create and run JUnit tests for the method `search()` in the class `FactList.java`. Your tests must reach every return statement in the method (at least four tests). Submit, on paper, printouts of your tests and a screen shot showing that they ran.
- B. (9 points) Which part of each test addresses **observability**?
- C. (9 points) Which part of each test addresses **controllability**?

2. (36 points) **JUnit test flaw**

The Java method `removeDuplicates()` is designed to remove all duplicate strings in the object.

(Clarification: `removeDuplicates()` should retain the first instance, and remove subsequent duplicate instances of the string.)

The following JUnit test method for `removeDuplicates()` has a flaw that is **not syntactic**. That is, assume this test compiles and runs to completion.

In the test method, `words` is an instance of an object that stores strings in the order they are added. `words` has methods `add()`, `removeDuplicates()`, and `getFirst()`, which do exactly what you would expect from their names. You can assume that `words` has been properly instantiated and the `add()` and `getFirst()` methods have already been tested.

```
@Test
public void testRemoveDuplicates() {
    words.add("orange");
    words.add("apple");
    words.add("apple");
    words.add("banana");
    words.removeDuplicates();
    assertTrue("removeDuplicates method", words.getFirst().equals("orange"));
}
```

- A. (18 points) Describe the flaw in terms of the RIPR model. Be as precise, specific, and concise as you can. For full credit, you must use the terminology introduced in the book.
- B. (18 points) Rewrite the test method to correct the flaw. (You can add more methods such as `toString()` to the object)

3. (10 points) Other factors to be determined while grading such as team collaborations,....