YOUR NAME: _____

RCS ID: _____

Your RCS ID is the first part of your RPI e-mail address

Principles of Software Quiz 3

Feb. 20, 2020

10 points total

Question 1. (4pts) Consider the specifications below. The *argument* is an integer.

- Spec A: returns: an integer $\geq$ its *argument*
- Spec B: returns: a positive non-zero integer $\geq$ its *argument*
- Spec C: returns: $-argument^3$
- Spec D: returns: $argument^3$

The return statements from implementations are as follows:

- Impl 1: `return abs(arg);` _____
- Impl 2: `return arg * 2;` _____
- Impl 3: `return abs(arg * arg * arg);` _____

For each implementation, fill in the blanks above by indicating which specifications it satisfies. If it does not satisfy any of the specs, write "None". Letters may be used more than once.

Question 2. (2pts) Consider specifications A and B below.

```
Spec A:                          Spec B:
requires: arg > 0                requires: arg >= 0
returns: 0 <= result < 10        returns: 0 <= result <= 10
```

(a) A is stronger than B.
(b) B is stronger than A.
(c) Neither is A stronger than B nor is B stronger than A.

Question 3. (2pts) Consider specifications A and B below.

```
Spec A:                 Spec B:
requires: arg > 0       requires: none
returns: log(arg)       returns: log(arg) if arg > 0 and arg is not Double.POSITIVE_INFINITY,
                                 Double.POSITIVE_INFINITY if arg is Double.POSITIVE_INFINITY,
                                 Double.NEGATIVE_INFINITY if arg == 0,
                                 Double.NaN if arg < 0 or arg is Double.NaN
```

(a) A is stronger than B.
(b) B is stronger than A.
(c) Neither is A stronger than B nor is B stronger than A.

Question 4. (2pts) The ADT design methodology

(a) Enables reasoning about correctness of implementation.
(b) Bridges the gap between problem domain and implementation.
(c) Helps hide implementation detail from clients.
(d) All of the above.