**15-214 - Principles of Software Construction: Objects, Design, and Concurrency**
**Class Participation Sheet**
**Correctness and Hoare Logic**

**Andrew IDs: _____ _____**

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**Question 1.** Consider the following Hoare triples:

(A) { $z == y + 1$ } `x = z * 2;` { $x == 4$ }

(B) { $y == 7$ } `x = y + 3;` { $x > 5$ }

(C) { *false* } `x = 2 / y;` { *true* }

(D) { $y < 16$ } `x = 2 / y;` { $x < 8$ }

Which triples are invalid? What model (valuation of variables) witnesses the invalidity?

For which valid triples can you write a weaker precondition with the same postcondition?

For which valid triples can you write a stronger postcondition with the same precondition?

**Question 2.** Compute the weakest precondition in each case.

(A) { } `x = y * 2;` { $x == y * 2$ }

(B) { } `x = x + 3;` { $x == z$ }

(C) { } `x = x + 1; y = y * x;` { $y == 2 * z$ }

(D) { } `x = 0;` { $x == 1$ }

(E) { } `x = 0;` { *true* }

(F) { } `if (x > 0) then { y = x; } else { y = 0; }` { $y > 0$ }