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CS 362 -- Section 400
Assignment 4

Random Testing:

For my random tests, I borrowed heavily from my unit test code. However, I added input randomization as well. Since the village and great hall cards are so straightforward, all I could think to randomize was how many of them were used in a row. Since the hand started with 5 cards, I tested each randomly with 1-5 times, and made sure that the handCount stayed the same (-1 card for each played, and +1 card drawn for each played), and actions went up by 1 or 2 times the number of cards played for great hall and village, respectively. For adventurer, I first set a random number of players before initializing the game, and then I divided a random number of cards between the deck and discard of the current player, and then I put a random number of treasure in random places throughout the deck and discard. I then tested to make sure that it was still the correct player's turn, and finally I tested that the player got the correct number of coins.

Village and great hall passed all tests, but adventurer did not, which was to be expected, as I added a bug to that card that makes it draw 3 treasures instead of 2.

Code Coverage:

- Village: The village card is very simple, with only 3 statements and no branches. My test called each of the statements 620 times, easily achieving 100% statement coverage (and branch coverage by default).
- Great Hall: Since the great hall card's case has no branches, my test got full branch coverage by default. According to dominion.c.gcov, it also got full statement coverage, running each statement 572 times.
- Adventurer: For the adventurer card, my random test, which tested it 200 times, took almost no time (probably less than a second), and it achieved 100% statement and branch coverage. Pairs of branches were not covered very evenly compared to one another, but there was no branch that wasn't taken at all. Most statements were covered at least 200 times (more in the case of loops), but there was one line ("shuffle(currentPlayer, state)") that was only taken 20 times. Nonetheless, 200 tests was plenty to make sure that we got full statement coverage.

Unit vs. Random:

All of both my unit and random tests for adventurer, village, and great hall cards achieved 100% statement and branch coverage, but in the case of adventurer, more complex types of coverage such as path coverage, were probably higher in the unit tests, as the branches were run more evenly. As for the village and great hall cards, the random tests ran each many more times than the unit tests, so they were technically more thoroughly tested. However, since they are such straightforward cards, that most likely didn't change much, and it

could be changed in my unit test just by adding a loop around the whole test to make it run hundreds of times like the random tests did.