Coffee Maker Quest

Joe Hagner and Mark Silvis

CS 1699 – Deliverable 2: Unit Testing and Code Coverage

When writing tests for Coffee Maker Quest, dependencies were the main source of any issues that we faced. There are some tests that have dependencies on other methods within the same class, which cannot be stubbed out. For example, the test for the method getSugar() in the Player class depends on the method hasAllItems() working correctly in order to pass. This is not ideal, since it means that the test is more brittle; however, we had no other way to check that sugar was acquired, as the Boolean variable that holds the state of sugar possession is private. There was also the issue of testing methods that return the same value via different branches. For example, the drink() method in the Player class returns true if the player has all three items (sugar, cream, and coffee) and false if the player is missing any one or more of the items. In order to ensure that the correct branches were taken we decided to test the console output by redirecting the print stream to a byte array output stream and checking that it contained the appropriate message(s), since the branches printed unique messages to the player.

We anticipate experiencing both of the issues we faced when testing code in the future. To avoid having too many dependencies within a class that cannot be mocked or stubbed it is important to write modularized object-oriented code. Breaking classes into smaller, more unique classes or subclasses will help prevent brittle tests such as our testGetSugar() test. Also, having methods that return unique error codes instead of simply Boolean values would help prevent having to write difficult tests that check console logs.

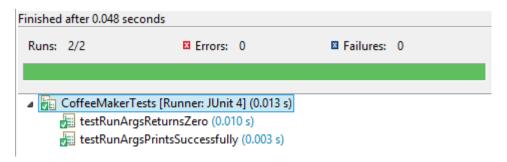
After running our tests, we had a total of five tests fail. Both testDoSomethingHelp() and testDoSomethingHelpLowercase(), which test the help command in the Game class's doSomething() method, failed because that command is not implemented. We manually failed

these tests because we knew beforehand that the command wasn't implemented. Our test testDoSomethingNorthLowercase() failed because the Game class's doSomething() method does not check for the lowercase letter "N", just the uppercase. The testMoveSouthNoDoor() and testMoveNorthNoDoor() tests failed because the House class's moveSouth() and moveNorth() methods, on which they are dependent, respectively, do not first check whether the room the player is in has the necessary door.

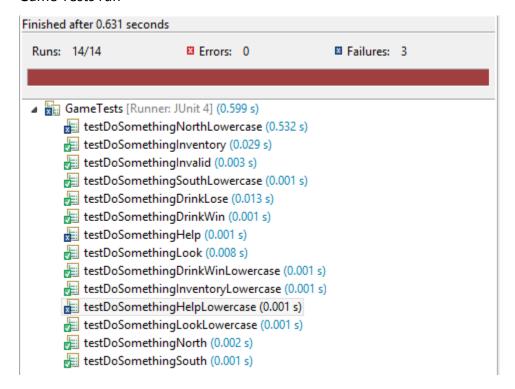
Repository is located here: https://github.com/markalan7/d2

Screenshots of executed unit tests

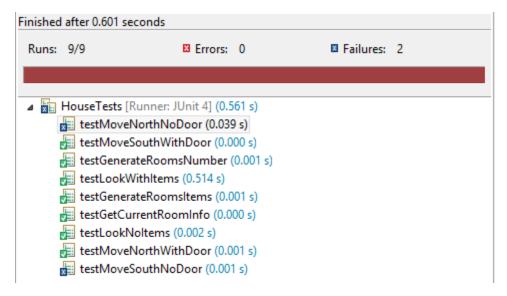
Coffee Maker Tests run



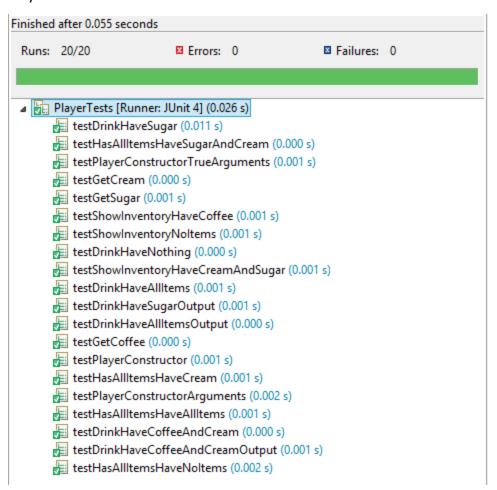
Game Tests run



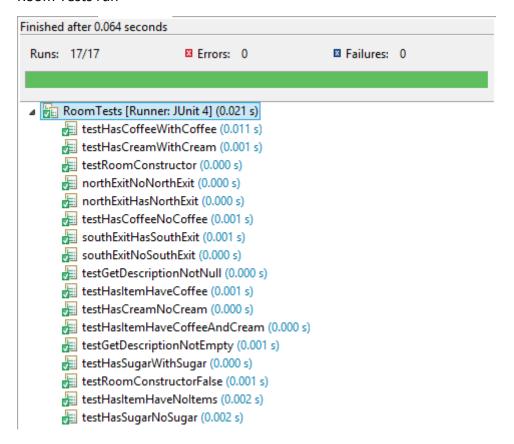
House Tests run



Player Tests Run



Room Tests run



Screenshots of coverage

Code coverage

| ment | | | C | overage | Covered Instructio | Missed Instructions | Total Instruction |
|-------|----------|-------------------------------|--|--------------------|--------------------|---------------------|-------------------|
| ڪ√ d2 | | | | 91.8 % | 2,660 | 237 | 2,8 |
| | | | | 90.9 % | 1,365 | 137 | 1,5 |
| 4 🖶 | com.labo | on | | 90.9 % | 1,365 | 137 | 1,5 |
| 4 | Game | .java | | 54.5 % | 73 | 61 | 1 |
| | ⊿ | ame | | 54.5 % | 73 | 61 | 1 |
| | | run() | | 0.0 % | 0 | 61 | |
| | | Game(Player, House) | | 100.0 % | 15 | 0 | |
| | | doSomething(String) | | 100.0 % | 58 | 0 | |
| 4 | | eMaker.java | I | 20.3 % | 14 | 55 | |
| | _ | offeeMaker | | 20.3 % | 14 | 55 | |
| | | main(String[]) | | 0.0 % | 0 | 50 | |
| | | runGameLoop(Player, House, | | 0.0 % | 0 | 5 | |
| | | runArgs(String) | | 100.0 % | 11 | 0 | |
| 4 | ☐ Playe | | _ | 90.6 % | 144 | 15 | 1 |
| | ⊿ G PI | | | 90.6 % | 144 | 15 | 1 |
| | | drink() | _ | 75.4 % | 46 | 15 | |
| | | Player() | <u>. </u> | 100.0 % | 12 | 0 | |
| | | Player(boolean, boolean, bool | - | 100.0 % | 21 | 0 | |
| | 0 | , , | | 100.0 % | 7 | 0 | |
| | 0 | 2 | | 100.0 % | 7 | 0 | |
| | 0 | , , , | H | 100.0 % 100.0 % | 7 | 0 | |
| | | hasAllItems() | - | 100.0 % | | 0 | |
| | | showInventory() | - | 96.8 % | 31 181 | 0 | 1 |
| 4 | ⊿ G H | | - | 96.8 % | 181 | 6 | 1 |
| | | look(Player, Room) | _ | 82.4 % | 28 | 6 | ı |
| | | House(int) | - | 100.0 % | 23 | 0 | |
| | | House(Room[]) | | 100.0 % | 21 | 0 | |
| | • | | _ | 100.0 % | 75 | 0 | |
| | • | | _ | 100.0 % | 20 | 0 | |
| | | moveNorth() | ī | 100.0 % | 7 | 0 | |
| | | moveSouth() | | 100.0 % | 7 | 0 | |
| 4 | D | • | _ | 100.0 % | 953 | 0 | 9 |
| | ⊿ G Ro | | | 100.0 % | 953 | 0 | 9 |
| | | Room(boolean, boolean, bool | <u> </u> | 100.0 % | 40 | 0 | |
| | | generateDescription() | ı | 100.0 % | 59 | 0 | |
| | | getAdjective() | | 100.0 % | 662 | 0 | 6 |
| | | getDescription() | | 100.0 % | 3 | 0 | |
| | | getNoun() | | 100.0 % | 158 | 0 | 1 |
| | 0 | - | _ | 100.0 % | 3 | 0 | |
| | 0 | | | 100.0 % | 3 | 0 | |
| | | hasltem() | | 100.0 % | 13 | 0 | |
| | | hasSugar() | | 100.0 % | 3 | 0 | |
| | | northExit() | | 100.0 % | 3 | 0 | |
| | | southExit() | | 100.0 % | 3 | 0 | |

Test coverage

| offeeMakerTests (1) (Feb 17, 2015 3:25:49 PM) | | | | | |
|---|----------|------------------|--------------------|---------------------|--------------------|
| Element | Coverage | | Covered Instructio | Missed Instructions | Total Instructions |
| ₫ 📴 dą̃ | | 91.8 % | 2,660 | 237 | 2.89 |
| ▶ | | 90.9 % | 1,365 | 137 | 1,50 |
| ▲ (♣ tests | | 92.8 % | 1,295 | 100 | 1,39 |
| △ ⊕ (default package) | | 92.8 % | 1,295 | 100 | 1,39 |
| ■ HouseTests.java ■ HouseTests | | 83.5 % 83.5 % | 330 330 | 65 65 | 39 39 |
| | | | | | |
| testMoveSouthNoDoor() | | 0.0 % | 0 | 32 | 3 |
| testGenerateRoomsItems() | - | 97.0 % | 32 | 1 | |
| clearOutputStream() | 1 | 100.0 % | 3 | 0 | |
| setOutputStream() | 1 | 100.0 % | 7 | 0 | |
| testGenerateRoomsNumber() | | 100.0 % | 13 | 0 | • |
| testGetCurrentRoomInfo() | 1 | 100.0 % | 11 | 0 | , |
| testLookNoltems() | | 100.0 % | 84 | 0 | |
| testLookWithItems() | | 100.0 % | 84 | 0 | |
| testMoveNorthWithDoor() | _ | 100.0 % | 43 | 0 | 4 |
| testMoveSouthWithDoor() | _ | 100.0 % | 45 | 0 | 4 |
| ■ GameTests.java | | 91.6 % | 361 | 33 | 39 |
| | | 91.6 % | 361 | 33 | 3 |
| testDoSomethingNorthLowercase() | | 0.0 % | 0 | 27 | |
| testDoSomethingHelp() | 1 | 0.0 % | 0 | 3 | |
| testDoSomethingHelpLowercase() | 1 | 0.0 % | 0 | 3 | |
| clearOutputStream() | 1 | 100.0 % | 3 | 0 | |
| setOutputStream() | | 100.0 % | 7 | 0 | |
| testDoSomethingDrinkLose() | | 100.0 % | 38 | 0 | |
| testDoSomethingDrinkWin() | | 100.0 % | 38 | 0 | |
| testDoSomethingDrinkWinLowercase() | | 100.0 % | 38 | 0 | |
| testDoSomethingInvalid() | | 100.0 % | 28 | 0 | |
| testDoSomethingInventory() | | 100.0 % | 29 | 0 | |
| testDoSomethingInventoryLowercase() | | 100.0 % | 29 | 0 | |
| testDoSomethingLook() | | 100.0 % | 31 | 0 | |
| testDoSomethingLookLowercase() | | 100.0 % | 31 | 0 | |
| testDoSomethingNorth() | | 100.0 % | 27 | 0 | |
| testDoSomethingSouth() | | 100.0 % | 27 | 0 | - |
| testDoSomethingSouthLowercase() | | 100.0 % | 27 | 0 | |

| OffeeMakerTests (1) (Feb 17, 2015 3:25:49 PM) | | | | | |
|--|----|------------|--------------------|---------------------|--------------------|
| Element | Co | overage Co | Covered Instructio | Missed Instructions | Total Instructions |
| ■ PlayerTests.java | | 99.4 % | 307 | 2 | 30 |
| | | 99.4 % | 307 | 2 | 30 |
| testShowInventoryHaveCreamAndSugar() | | 96.2 % | 25 | 1 | 2 |
| testShowInventoryNoltems() | | 96.7 % | 29 | 1 | 3 |
| clearOutputStream() | 1 | 100.0 % | 3 | 0 | |
| setOutputStream() | | 100.0 % | 7 | 0 | |
| testDrinkHaveAllItems() | | 100.0 % | 11 | 0 | 1 |
| testDrinkHaveAllItemsOutput() | | 100.0 % | 19 | 0 | • |
| testDrinkHaveCoffeeAndCream() | | 100.0 % | 11 | 0 | |
| testDrinkHaveCoffeeAndCreamOutput() | | 100.0 % | 19 | 0 | |
| testDrinkHaveNothing() | | 100.0 % | 11 | 0 | |
| testDrinkHaveSugar() | | 100.0 % | 11 | 0 | |
| testDrinkHaveSugarOutput() | | 100.0 % | 19 | 0 | |
| testGetCoffee() | | 100.0 % | 13 | 0 | |
| testGetCream() | | 100.0 % | 13 | 0 | |
| testGetSugar() | | 100.0 % | 13 | 0 | |
| testHasAllItemsHaveAllItems() | | 100.0 % | 11 | 0 | |
| testHasAllItemsHaveCream() | | 100.0 % | 11 | 0 | |
| testHasAllItemsHaveNoItems() | | 100.0 % | 11 | 0 | |
| testHasAllItemsHaveSugarAndCream() | _ | 100.0 % | 11 | 0 | |
| testPlayerConstructor() | - | 100.0 % | 9 | 0 | |
| testPlayerConstructorArguments() | _ | 100.0 % | 12 | 0 | |
| testPlayerConstructorTrueArguments() | _ | 100.0 % | 12 | 0 | |
| testShowInventoryHaveCoffee() | _ | 100.0 % | 18 | 0 | |
| | 1 | 100.0 % | 48 | 0 | |
| | | 100.0 % | 48 | 0 | |
| clearOutputStream() | | 100.0 % | 3 | 0 | |
| setOutputStream() | _ | 100.0 % | 7 | 0 | |
| testRunArgsPrintsSuccessfully() | | 100.0 % | 17 | 0 | |
| testRunArgsReturnsZero() | | 100.0 % | 13 | 0 | |

| CoffeeMakerTests (1) (Feb 17, 2015 3:25:49 PM) | | | | | |
|---|----------|---------|--------------------|---------------------|--------------------|
| Element | Co | verage | Covered Instructio | Missed Instructions | Total Instructions |
| ▲ 🔁 dã | | 91.8 % | 2,660 | 237 | 2,89 |
| | | 90.9 % | 1,365 | 137 | 1,50 |
| | | 92.8 % | 1,295 | 100 | 1,39 |
| | | 92.8 % | 1,295 | 100 | 1,39 |
| | | 83.5 % | 330 | 65 | 39 |
| J GameTests.java | | 91.6 % | 361 | 33 | 39 |
| D PlayerTests.java | | 99.4 % | 307 | 2 | 30 |
| CoffeeMakerTests.java | 1 | 100.0 % | 48 | 0 | 4 |
| RoomTests.java | _ | 100.0 % | 249 | 0 | 24 |
| | | 100.0 % | 249 | 0 | 24 |
| clearOutputStream() | | 100.0 % | 3 | 0 | |
| northExitHasNorthExit() | | 100.0 % | 13 | 0 | 1 |
| northExitNoNorthExit() | | 100.0 % | 13 | 0 | 1 |
| setOutputStream() | = | 100.0 % | 7 | 0 | |
| southExitHasSouthExit() | | 100.0 % | 13 | 0 | 1 |
| southExitNoSouthExit() | | 100.0 % | 13 | 0 | • |
| testGetDescriptionNotEmpty() | | 100.0 % | 17 | 0 | • |
| testGetDescriptionNotNull() | | 100.0 % | 17 | 0 | 1 |
| testHasCoffeeNoCoffee() | | 100.0 % | 13 | 0 | 1 |
| testHasCoffeeWithCoffee() | _ | 100.0 % | 13 | 0 | 1 |
| testHasCreamNoCream() | | 100.0 % | 13 | 0 | 1 |
| testHasCreamWithCream() | | 100.0 % | 13 | 0 | 1 |
| testHasItemHaveCoffee() | | 100.0 % | 13 | 0 | 1 |
| testHasItemHaveCoffeeAndCream() | | 100.0 % | 13 | 0 | 1 |
| testHasItemHaveNoItems() | | 100.0 % | 13 | 0 | 1 |
| testHasSugarNoSugar() | | 100.0 % | 13 | 0 | 1 |
| testHasSugarWithSugar() | | 100.0 % | 13 | 0 | 1 |
| testRoomConstructor() | | 100.0 % | 14 | 0 | 1 |
| testRoomConstructorFalse() | | 100.0 % | 14 | 0 | 1 |