**SingleGame**

**Test Case 1**: Hint()

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| **Rules/Constraints** | **Valid Equivalence Classes** | **Invalid Equivalence Classes** |
| hint must guess a single letter | 1. guess is a single letter that is part of the solution word  2.guess is a single letter that isn’t part of the solution word | 3. guess is a special character  4.guess is a number |
| hint must guess a letter that’s part of the solution word | 5. guess is a letter part of the solution word | 6. guess is not part of the solution word |
| hint can’t guess the same letter twice | 7. guess is a unique letter that hasn’t been guessed yet | 8. hint guessed a letter that has already been guessed |
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Assume that theWord = “I’ll-be-Testing”

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| **Test value** | **Test equivalence # mapping** |
| ‘T’ | 1,5,7 |
| ‘-’ | 3 |
| ‘9’ | 4 |
| ‘y’ | 6, 7 |
| ‘t’ | 8 |

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| **Operation** | **Purpose** | **Changed Object State** | **Expected result** |
| SingleGame game = new SingleGame(); | Test instantiation of a new SingleGame object | badGuessNum=0;  wordLetters = new SinglyLinkedList<String>();  guessedLetters = new SinglyLinkedList<String>();  theWord = dic.receiveNextWord();  //for Testing purposes theWord //is hardcoded  theWord = “I’ll-be-testing”  wordLetters = {I, L, b, e, t, s, I, n, g}  toString() = \*’\*\*-\*\*-\*\*\*\*\*\*\* |  |
| game.hint() | Test hint functionality | guessedLetters has a random letter of the word added to it  For this example it’ll be “T”  guessedLetters = ‘T’  toString()=\*’\*\*-\*\*-t\*\*t\*\*\* |  |
| game.hint() | Test hint functionality a second time | guessedLetter has a random letter from wordLetter added to it, but not the same one.  For this example it’ll be “e”  guessedLetters = ‘t,e’  toString()=\*’\*\*-\*\*-te\*t\*\*\* |  |
| game.hint() | Test hint() with a special character | guessLetter has nothing added to it, and randomize another index of theWord(), then guessLetter again |  |
| game.hint() | Test hint with a number | guessLetter has nothing added to it, and randomize another index of theWord(), then guessLetter again |  |
| game.hint() | Test hint with a letter that isn’t in the word | guessLetter has nothing added to it, and randomize another index of theWord(), then guessLetter again |  |
| game.hint() | Test hint with a a letter that’s already been guessed | guessLetter has nothing added to it, and randomize another index of theWord(), then guessLetter again |  |

**Test Case 2:** getGuessesLeft () and guessLetter(char guess)

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| **Rules/Constraints** | **Valid Equivalence Classes** | **Invalid Equivalence Classes** |
| guess in guessLetter must be a char | 1. guess is a char | 2. guess is any other data type (String, char, object, int, double, ect…) |
| guess must be a letter, upper or lower case | 3. guess is a letter, upper Case  4.guess is a char, lower Case | 5. guess is a number  6. guess is a special character other than - or ‘ |
| Can only guess a letter when the game is not over | 7. Game is not over | 8.Game is over |
| Can only guess a letter that hasn’t already been guessed | 9. guess is a letter that hasn’t been guessed | 10. guess is a letter that has already been guessed |

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| **Test value** | **Test equivalence # mapping** |
| ‘C’ | 1, 3, 9 |
| ‘e’ | 1, 4, 9, 10 |
| “letter” | 2 |
| ‘9’ | 5 |
| ‘\*’ | 6 |

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| **Operation** | **Purpose** | **Changed Object State** | **Expected result** |
| SingleGame game = new SingleGame(); | Test instantiation of a new SingleGame object | badGuessNum=0;  wordLetters = new SinglyLinkedList<String>();  guessedLetters = new SinglyLinkedList<String>();  theWord = parentGame.receiveNextWord();  //for Testing purposes theWord //is hardcoded  theWord = “Test” |  |
| game.getGuessesLeft() | test getGuessesLeft() |  | 6 |
| game.guessLetter (‘C’) | Test guessLetter functionality with a wrong letter | badGuessNum=1  guessedLetters={C} | false |
| game.getGuessesLeft() | test getGuessesLeft() |  | 5 |
| game.guessLetter (‘e’) | Test guessLetter functionality with a correct letter | guessedLetters={e, C} | true |
| game.getGuessesLeft() | test getGuessesLeft() |  | 5 |
| game.guessLetter(‘9’) | test guessLetter with a char that is a number | guessedLetters has nothing added to it | false  new IllegalArgumentException thrown |
| game.guessLetter(‘\*’) | test guessLetter with a char that is a special Character | guessedLetters has nothing added to it | false  new IllegalArgumentException thrown |
| game.guessLetter(‘e’) | test guessLetter with a letter that has already been guessed | guessedLetters has nothing added to it | false |

**Test Case 3:** toString()

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| **Rules/Constraints** | **Valid Equivalence Classes** | **Invalid Equivalence Classes** |
| when a letter is guessed, all instances of it in the solution word must be displayed | 1.All letters are displayed in the word | 2.Only one of two letters are displayed |
| toString() must return a string | 3.returns a string | 4.returns any other data type (String, char, object, int, double, ect…) |
| toString() must display all the guesses letters that are also part of the solution word | 5.toString() contains all the letters that are part of the solution word | 6. There is a guessed letter that is not shown in toString() |

Assume that theWord = “Test”

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| **Test value** | **Test equivalence # mapping** |
| “Test” | 1, 3 |
| 9 | 4 |
| “T\*\*T” | 2 |
| “\*e\*\* | 6. |

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| **Operation** | **Purpose** | **Changed Object State** | **Expected result** |
| SingleGame game = new SingleGame(); | Test instantiation of a new SingleGame object | badGuessNum=0;  wordLetters = new SinglyLinkedList<String>();  guessedLetters = new SinglyLinkedList<String>();  theWord = parentGame.receiveNextWord();  //for Testing purposes theWord //is hardcoded  theWord = “Test”  wordLetters={T,e,s,t} |  |
| game.toString() | test toString () when there are no correct letters guessed |  | \*\*\*\* |
| game.guessLetter (‘t’) | Test guessLetter functionality with a correct letter | guessedLetters={t} |  |
| game.toString() | test toString() when some letter has been guessed |  | T\*\*t |
| game.guessLetter(‘e’) | Making sure that the ‘t’s stay and don’t dissapear | guessedLetters={e,t} | Te\*t |

**Test Case 4 :** containsStars()

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| **Rules/Constraints** | **Valid Equivalence Classes** | **Invalid Equivalence Classes** |
| containsStarts() must return true if the solution word still contains stars, or false if it does not | 1. returns true or false | 2. returns null or any other data type (String, char, object, int, double, ect…) |

Assume that theWord = “Test”

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| **Test value** | **Test equivalence # mapping** |
| “\*\*\*\*” | 1, 2 |
| “T\*\*\*” |  |
| “” |  |
| “Test” |  |

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| **Operation** | **Purpose** | **Changed Object State** | **Expected result** |
| SingleGame game = new SingleGame(); | Test instantiation of a new SingleGame object | badGuessNum=0;  wordLetters = new SinglyLinkedList<String>();  guessedLetters = new SinglyLinkedList<String>();  theWord = parentGame.receiveNextWord();  //for Testing purposes theWord //is hardcoded  theWord = “Test”  wordLetters={T,e,s,t} |  |
| game.toString() | test toString () when there are no correct letters guessed |  | \*\*\*\* |
| game.containsStars() | Test containsStars() with the word only contatining stars |  | true |
| game.guessLetter (‘E’) | Test guessLetter functionality with a correct letter | guessedLetters={E} |  |
| game.containsStars() | Test containsStars() with the word containing some stars |  | true |
| game.guessLetter (‘T’) | Test guessLetter functionality with a correct letter | guessedLetters={T, E} |  |
| game.guessLetter (‘S’) | Test guessLetter functionality with a correct letter | guessedLetter has ‘S’ added  guessedLetters={S, T, E} |  |
| game.containsStars() | Test containsStars() with the word containing no stars |  | false |

**Test Case 5:** isGameOver()

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| **Rules/Constraints** | **Valid Equivalence Classes** | **Invalid Equivalence Classes** |
| isGameOver() must return a boolean | 1. returns a boolean | 2.returns any other data type (Use null) (String, char, object, int, double, ect…) |
| isGameOver() must return true if numbadGuesses is greater or equal to 6 | 3.returns true | 4. false |
| isGameOver() must return true if containsStarts() is false | 5.returns true | 6.returns false |
| isGameOver() must return false if neither of the two above conditions are met | 7.returns false | 8.returns true |

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| **Test value** | **Test equivalence # mapping** |
| true | 1, 3, 5, 8 |
| false | 4, 6, 7 |
| null | 2 |
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| **Operation** | **Purpose** | **Changed Object State** | **Expected result** |
| SingleGame game = new SingleGame(); | Test instantiation of a new SingleGame object | badGuessNum=0;  wordLetters = new SinglyLinkedList<String>();  guessedLetters = new SinglyLinkedList<String>();  theWord = parentGame.receiveNextWord();  //for Testing purposes theWord //is hardcoded  theWord = “Test”  wordLetters={T,e,s,t} |  |
| SingleGamr game2 = new SingleGame() | Test instantiation of a new SingleGame object | badGuessNum=0;  wordLetters = new SinglyLinkedList<String>();  guessedLetters = new SinglyLinkedList<String>();  theWord = parentGame.receiveNextWord();  //for Testing purposes theWord //is hardcoded  theWord = “Test”  wordLetters={T,e,s,t} |  |
| game.isGameOver() | Test isGameOver() when game is not over |  | false |
| game.guessLetter (‘A’) | Test guessLetter functionality with a correct letter | guessedLetter={A}  badGuessNum=1 |  |
| game.guessLetter (‘B’) | Test guessLetter functionality with a correct letter | guessedLetter={B, A}  badGuessNum=2 |  |
| game.guessLetter (‘C’) | Test guessLetter functionality with a correct letter | guessedLetter={C, B, A}  badGuessNum=3 |  |
| game.guessLetter (‘D’) | Test guessLetter functionality with a correct letter | guessedLetter={D, C, B, A}  badGuessNum=4 |  |
| game.guessLetter (‘Z’) | Test guessLetter functionality with a correct letter | guessedLetter={Z, D, C, B, A}  badGuessNum=5 |  |
| game.guessLetter (‘F’) | Test guessLetter functionality with a correct letter | guessedLetter={F, D, C, B, A}  badGuessNum=6 |  |
| game.isGameOver() | Test isGameOver() when the game is over and loss | gameWon=false; | true |
| game2.isGameOver() | Test isGameOver() when game is not over |  | false |
| game2.guessLetter(‘T’) | Test guessLetter functionality with a correct letter | guessedLetter={T} |  |
| game2.guessLetter(‘E’) | Test guessLetter functionality with a correct letter | guessedLetter={E, T} |  |
| game2.guessLetter(‘S’) | Test guessLetter functionality with a correct letter | guessedLetter={S, E, T} |  |
| game2.isGameOver() | Test isGameOver() when game is over and won | gameWon=true | true |

**Player**

**Test Case 6:** incWins() and incLosses(), and instantiation using Both Player Constructors

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| **Operation** | **Purpose** | **Changed Object State** | **Expected result** |
| Player p1 = new Player(); | Test instantiation of a new Player object | timesPlayed =0;  playerName=”Anonymous”;  wins = 0; | a new blank player is created with the default name “Anonymous” |
| Player p2 = new Player(“Noah”); | Test instantiation of a new Player object | playerName = “Noah”  wins = 0;  timesPlayed =0; | a new blank player is created with the name of “Noah” |
| p1.incWins() | Test incWins() | wins=1  timesPlayed=1 |  |
| p2.incLosses() | Test incLosses() | timesPlayed = 1 |  |
| p2.getLosses() | Test getLosses() |  | 1 |
| p1.getWins() | Test getWins() |  | 1 |

**Test Case 7**: getPlayerName() and setPlayerName(name)

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| **Rules/Constraints** | **Valid Equivalence Classes** | **Invalid Equivalence Classes** |
| name must be a string | 1. name is a String | 2. name is any other data type (char, object, int, double, boolean ect…) |
| name must not be empty or set to null | 3. name length is >=0 | 4. name length is <0  5. name is null |
| getPlayerName must return a String | 6.Get playerName returns a string | 7.getPlayerName returns any other data type (String, char, object, int, double, boolean ect…) |

For mapping and testing for the name, see Test Case # , addPlayer(String player)

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| **Test value** | **Test equivalence # mapping** |
| SEE TEST CASE #10 , addPlayer(playerName) | 1, 2, 3, 4, 5 |
| “true” | 6 |
| “W” | 7 |

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| **Operation** | **Purpose** | **Changed Object State** | **Expected result** |
| Player p1 = new Player(); | Test instantiation of a new Player object | timesPlayed =0;  playerName=”Anonymous”;  wins = 0; | a new blank player is created with the name “Anonymous” |
| Player p2 = new Player(“Noah”); | Test instantiation of a new Player object | playerName = “Noah”  wins = 0;  timesPlayed =0; | a new blank player is created with the name of “Noah” |
| p2.getPlayerName() | Test getPlayerName |  | Noah |
| p1.setPlayerName(“Tristan”) | Test setPlayerName(name) | wins=1  timesPlayed=1  playerName =”Tristan” |  |
| p1.getPlayerName() | Testing getPlayerName |  | Tristan |

**ScoreBoard**

**Test Case 8**: gamePlayed(name, winLoss)

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| **Rules/Constraints** | **Valid Equivalence Classes** | **Invalid Equivalence Classes** |
| name must be a string | 1. name is a String | 2. name is any other data type (Boolean, char, object, int, double, ect…) |
| name must not be empty or set to null | 3. name length is >=0 | 4. name length is <0  5. name is null |
| winLoss must be a boolean | 6. winLoss is a boolean | 7. winLoss is any other data type (use null) (String, char, object, int, double, ect…) |

For mapping and testing for the name, see Test Case # , addPlayer(String player)

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| **Test value** | **Test equivalence # mapping** |
| SEE TEST CASE #10 , addPlayer(playerName) | 1, 2, 3, 4, 5 |
| “true” | 6 |
| “W” | 7 |

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| ScoreBoard board = new ScoreBoard(); | Test instantiation of a new ScoreBoard | players = new DoublyLinkedList<>() | A new Scoreboard window is created |
| players.add(new Player(“Noah”) | Test adding a new Player to players | a new Player is created with the name “Noah” and is added to players |  |
| board.gamePlayed(“Noah”, true) | Test gamePlayed(name, winLoss) with a Player that already exists, and a win | The Player Noah has a win added |  |
| board.gamePlayed(“Tristan”, true) | Test gamePlayed(name, winLoss) with a Player that does not exist, and a win | a new Player is created with the name “Tristan”, and added to players. The Player “Tristan” has a win added |  |
| board.gamePlayed(“Tristan”, false) | Test gamePlayed with a player that exists, and a loss | the Player “Tristan” has a loss added |  |
| board.gamePlayed(“Abbi”, false | Test gamePlayed(name, winLoss) with a Player that does not exist, and a loss | a new Player is created with the name “Abbi”, and added to players. The Player “Abbi” has loss added |  |
| board.gamePlayed(“Abbi”, “W”); | Test gamePlayed with an Illegal Data type for winLoss |  | IllegalArgumentException |

**Test Case 9**: sortScoreboard()

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| **Rules/Constraints** | **Valid Equivalence Classes** | **Invalid Equivalence Classes** |
| sortScoreboard must sort alphabetically by name a DoublyLinkedList of type Player | 1.Sorts a DoublyLinkedList of type player by name aphabetically | 2. Does not sort alphabetically by name |

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| **Test value** | **Test equivalence # mapping** |
| players = {Noah, Tristan, Abbi} | 1 |
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| ScoreBoard board = new ScoreBoard(); | Test instantiation of a new ScoreBoard | players = new DoublyLinkedList<>() | A new Scoreboard window is created |
| board.gamePlayed (“Noah”, true); | Test adding a new Player to players | a new Player is created with the name “Noah” and is added to players, also has a win added  players = {“Noah”} |  |
| board.gamePlayed (“Tristan”, true); | Test adding a new Player to players | a new Player is created with the name “ Tristan ” and is added to players  players = {“Noah”, “Tristan”} |  |
| board.gamePlayed (“Abbi”, true); | Test adding a new Player to players | a new Player is created with the name “ Abbi ” and is added to players  players = {“Noah”, “Tristan”, “Abbi”} |  |
| board.sort() | Testing sort method | players = {“Abbi”, “Noah”, “Tristan”} |  |

Dictionary

**Test Case 10:** Default constructor and nextWord()

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| Dictionary dic = new Dictionary() | Test instantiation of a new Dictionary | allWords = {//all words in dictionary.txt file} | A new Dictionary is created |
| dic.nextWord() | Test nextWord() | allWords = {//all words except for the word returned by nextWord()} | currentWord |
| //Imagine reaching the end of the file by doing dic.nextWord() n amount of times |  |  |  |
| dic.nextWord() | Test nextWord() when allWords is empty | allWords ={} | Out of words, reloading file |
| dic.nextWord() | Test nextWord() | allWords = {//all words except for the currentWord} | currentWord |

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| **Rules/Constraints** | **Valid Equivalence Classes** | **Invalid Equivalence Classes** |
| nextWord() must return a String | 1.returns a String | 2.returns any other data type (int, boolean, double, object, null, ect…) |
| nextWord() must delete the word It returns from allWords | 3. Deletes the word it returns | 4. Does not Delete the word it returns |