*Exercise 2: Penalty Box (Game.cpp)*

***Explained***

***This exercise has us debug and correct the penalty\_box functionality within the same game. Running the code doesn’t result in any errors, but there is some curious behavior in regards to players purse amounts within the game. Also, players arbitrarily seem to be released from (and/or sent to) the penalty box without ever getting an answer wrong.***

* The first thing I realized in this code is that, when not updating main, we should make our **exercise\_2** branch based off of the **exercise\_1** branch to save having to do redundant work: “**git checkout -b exercise\_2 exercise\_1**”
* Secondly, I see that the branch name suggestion for exercise\_1 (ironically the exercise containing the spelling mistake), was purposely misspelled. ☺
* Next, before getting to the penalty box code I had to follow the behavior of the program line-by-line. The Game.add() function is the first stop, and the logic inside is a little off:

**Text

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The players() array is a vector (dynamic array) containing the names of all the players that have been added to the game one-by-one. The array starts off empty and on line 19 we add **only** player “chet”.

**Graphical user interface, text

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Because “chet” is currently our only player, the players() vector should have a size of 1 (as it does). The problem is that line 48, 49, and 50 assume that counting numbers in C++ will start at the number one. Therefore, the code instantiates the below listed respective arrays at position “1” instead of at position “0” as it should be. Remember, even though there is only one person in the array so far ,m in programming all counting starts at position 0. Essentially, this game is skipping the first player presumably causing all sorts of wonky behavior:

**Graphical user interface, text

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This next screenshot below, although not the next step in the code, is the reason why our player #1 “chet” always starts off in the penalty box. Specifically his “isPenaltyBox” position is set to true:

Graphical user interface, text

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We could actually correct this be removing the line above, but instead I’ll correct it by offsetting the players.size() values by “-1”:

Text

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We can now take out this useless line:

Text

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We can prove that this is correct by looking at the refactored output. Now the 1st player (“Chet”) does not have to start off (or subsequently come out of) the penalty box. Instead Pat rightly gets penalized for answering a question wrong:

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We now see that Pat is the first person to get sent to the penalty box and the first to get out (as it should be) since she is the only player to have answered wrong so far.

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The immediate round of regression tests performed afterwards will, of course, fail because we have made changes that alter out output in some situations yet we have not updated the tests themselves.

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To do proper regression testing on the new code, we must first re-write all of the tests to adhere to the new code.

Ah…! Tests still failed despite rewriting… Must do deeper debugging… but its 5:43pm…