While first approaching the problem we decided to make some conclusions about what the score would have to equal to win with zero turns left.
If the score was greater than or equal to 1, you win and if it was less than or equal to 0 you lost. We later used these as our base cases.
We also made the conclusion that because a high score does not matter, you only have to use quarters when the absolute value of score is greater than the amount of turns left,
in order to have a more likely shot of making your score positive before your turns run out.

The approach we decided to take first to solve the problem was to use a recursion function in Python.
We knew we had to have a base case and so we used an if statement setting the values of all scores when turns left equaled 0 to a certain amount.
Our recursive step was to use the else statement to call the same function but with score = score-1 or score +1 for dimes and for score = score-2 or score + 2 for quarters,
and to have that run through the function until it reached our base case. This part of the process did not work for us.
Due to our group's lack of experience with Python, we decided to take what we had already figured out and put it into an excel file.

We again knew we had to have a base case. Using our conclusions from before, at turn 0 we set all scores that are less than or equal to 0 equal to 0% (0) and all scores that are
greater than or equal to one equal to 100% (1).
For dimes the algorithm 0.5*(s-1,t-1)+0.5(s+1,t-1) was implemented because with s, t you had a 50% chance of getting s-1,t -1 and a 50% chance of getting s+1, t-1.
For quarters the same algorithm was implemented except with the score-2 and score +2, so it looked like this 0.5*(s-2,t-1)+0.5(s+2,t-1).
If we set each cell equal to these algorithms, which we did at first, it would play a game of just dimes and just quarters, which is not what our game is.
Instead, to play the game using dimes and quarters when it is valuable to use both, we used this algorithm: MAX(0.5*(s-1,t-1)+0.5(s+1,t-1), 0.5*(s-2,t-1)+0.5(s+2,t-1)) in each cell.
This gave us the larger percentage of winning, but what we wanted was: should we flip a dime or quarter?
We printed this out on a second sheet of our excel file using an if statement that printed a 0, indicating that you should flip a dime, and that the dime's percentage was larger

or printed a 1, indicating that you should flip a quarter and that the quarter's percentage was larger. If the dime and quarter's percentages were equal, the statement printed a 0,
because it did not matter if you flipped a dime or a quarter in that instance.

Some patterns that we recognized were that if you center the excel file at score = 0, there is a lot of symmetry to be found, in a pyramid shape.