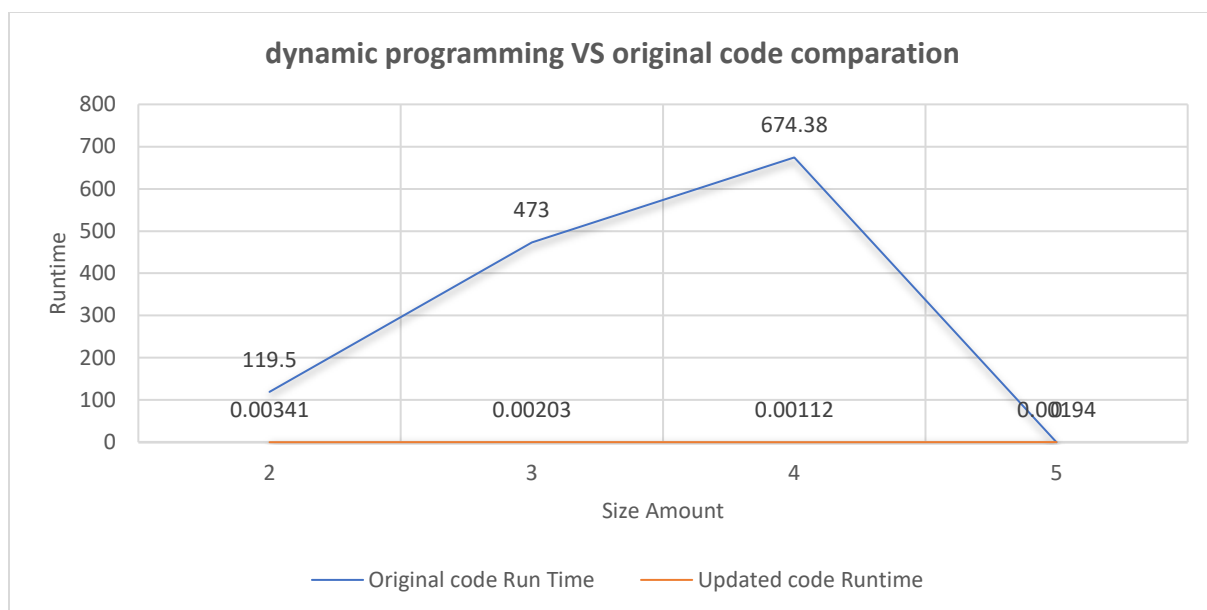


	Original code		Optimize code		
Size Amount	Coins	Run Time	Size Amount	Coins	Runtime (s)
65	1, 5	119.5	65	1, 5	0.00341
65	1, 5, 10	473	65	1, 5, 10	0.00203
65	1, 5, 10, 25	674.38	65	1, 5, 10, 25	0.00112
65	1, 5, 8, 10, 25	Too long	65	1, 5, 8, 10, 25	0.00194
65	1, 5, 8, 10, 15, 25	Too long	65	1, 5, 8, 10, 15, 25	0.00299
65	1, 5, 7, 8, 10, 12, 15, 25	Too long	65	1, 5, 7, 8, 10, 12, 15, 25	0.00498
65	1, 5, 7, 8, 10, 12, 15, 20, 25	Too long	65	1, 5, 7, 8, 10, 12, 15, 20, 25	0.000998



My updated programming algorithm to solve the change-making problem. Num_coins take three parameters: the amount of change we want to make, a list of valid coin values, and the min number of coins for each value.

For my updated code, in this loop in line 6, we consider using all possible coins to make change for the amount specified by cents. Also, it keeps track of the coins used by remembering the last coin we add for each entry. If I know the last coin which were added, my code can subtract the value of the coin. Then we get the previous amount. We can keep tracing back until we get to the beginning.