Exercises - Home project 2

Include all your reasoning steps, but only the neccesary ones.

Total points (10 + 2 Bonus)

PS: Ideally use NetworkX library that can save you a lot of effort, but do not use functions that already solve the problems for you.

(1) Make a program that generates a random graph G_1 with 30 vertices. (for instance using Erdos-Renyi procedure (look on the wiki/youtube)) (2 pts)

(2) Get the sequence of degrees of vertices from the graph G_1 and use some algorithm to generate a new graph with such a sequence G_2 (if there is not any other with such a sequence, generate another one) (2 points)

(3) Program the algorithm, which will generate some (you can choose but not identically, ideally with some randomness) graph G' isomorphic to graph G. Generate graphs G'_1 and G'_2 (isomorphic to G_1 and G_2 respectively) like this. (3 points)

(4) Program an algorithm that receives these four graphs as input and find out which pairs are isomorphic. The brute force method is also sufficient, but if you struggle, and do something more "sensible" you can get more points (Hint: heuristics). (3-5 points for this part)