CENG 461 Artificial Intelligence
Homework 1

Due date: 21.11.2021

Implementation:
You are expected to write a Python program which calculates the solution for the following Constraint Satisfaction Problem:

Jamie has sold several t-shirts through his online company to 4 customers: Dean, Ellison, Moore, Quinn, but his records got messed up. He knows that he has sold one of each color (purple, black, red, green) and size (6, 7, 8, 9) and he remembers the following details:
- Dean's shirt is 2 sizes larger than the purple jersey.
- Ellison's shirt is smaller than Quinn's jersey.
- The green jersey is 1 size smaller than the black shirt.
- The red shirt is either the size 8 jersey or Moore's jersey.
- The red jersey is 1 size smaller than the green shirt.

Your program should have a function, ***apply_arc_consistency***, to apply arc-consistency to a domain, based on a list of constraints.

Your program should have a function, ***find_var_mrv***, to select a variable using Minimum Remaining Values approach where alphanumerical order is used in case of a tie.

Your program should have a function, ***find_val_lcv***, to select a value for a variable using Least Constraining Value where alphanumerical order is used in case of a tie.

Your program should start by applying arc consistency and this should be repeated after each variable-value assignment. It should check if a solution is reached after each arc-consistency application and each variable-value assignment.

Your implementation should be generalizable to any other similar problems.

TIPS (not mandatory) :
1. You can formulate the problem using 8 variables and 17 constraints.
2. With that approach, it only takes 2 arc-consistency checks and 1 variable-value assignment to reach the solution.