
Flicking Lights with GUI

You bought a new house. You need an electrician to set some lights for you with some switches. But.....the electrician made many mistakes. He associated some switches to lights in other rooms, meaning the switch operates the lights connected to this switch, and other lights in the house. He left all the lights ON. When you want to go to sleep you need to switch OFF the lights. Hmmm!

Task

1. Write a report showing your understanding analysis of this problem and what are the properties of the circuit to be sure that even if switches are connected to more than one light, we will be able to switch off all the lights. And other cases, what is the maximum of lights to be able to switch. To somehow ease the task, you can assume all the lights are ON at the start. You should discuss, solutions where some lights are OFF and other ones are ON.
2. The set of circuit will be defined by two lines: first line defining the lights with letters, and second line a set of edges. For examples circuit :
A B C D
AC AD BD CA
This means we have four lights. The edge AC means the switch controlling the light A controls the light C too and so on.
3. Develop a GUI where:
 - (a) the user can type in two lines as defined above.
 - (b) one button to load and visualise the circuit in user friendly manner.
 - (c) one button to solve the circuit step by step.
 - (d) one button to generate the list of buttons to push to either turn off all the lights or the maximum number of lights
 - (e) the GUI should allow the user to press the lights and see their effect on other lights.

(Pair)