
Lights On To Off

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. To somehow ease the task, you can assume all the lights are ON at the start.
2. Once you find the assumptions of the circuit and the general solution, write a simulation where you read a set of circuit for a file, and you show the steps in a user friendly way to solve this problem in a short number of steps.
3. 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.

Relates to Objectives

1.1, 1.2, 1.3, 1.4, 2.2, 2.4, 2.6, 2.9, 2.10, 3.1, 3.2, 3.3, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8

(2 points, Pair)