Assignment 8:

Installation

1. Open a command prompt in the folder, and type 'pip install –r requirements.txt' to make sure that all the dependencies are installed
2. To run the file, on a command prompt type 'python light_switches.py'

Explanation

1. **What is the state space?**

   The Statespace is I = {000, 001, 010, 011, 101, 110, 111}

   where eg 110 means switches one and two are on, and three is off.

   Equations that display probabilities

   x001 = x010 = x100,

   x011 = x101 = x110.

   x000 = 1 + (1/3)x001 + (1/3)x010 + (1/3)x100 = 1 + X001,

   x001 = 1 + (1/3)x000 + (1/3)x011 + (1/3)x101 = 1 + (1/3)x000 + (2/3)x011,

   x011 = 1 + (1/3)x001 + (1/3)x010 = 1 + (2/3)x001

   it takes on averge 10 passes to hit state 111 from 000

2. **Give a graphical representation of the Markov chain describing this process**

   The attached program generates the graphical representation of the Markov Chain describing the process.