Extra Credit

Name:_____

The following is from an old riddle. There is a special suite of rooms designed with light switches in an odd way. Our goal is to turn off all of the lights.

There are 25 rooms in the suite arranged in a square of five rooms by five rooms. As below where each number corresponds to a room.

1	2	3	4	5
6	7	8	9	10
21	22	13	14	15
16	17	18	19	20
21	22	23	24	25

The light switches operate in an odd way. If you switch the light switch in any room it toggles the lights in the adjacent room. For example

- assuming all of the lights are on and you switch the switch in room 1 the lights in room 2 and 6 are turned off and there is no other change in the status of the lights.
- or assuming all of the lights are on and you switch the switch in room 18 the lights in rooms 13, 17, 19 and 23 are all turned off and there is no other change in the status of the lights.

1. Assuming all of the lights are on please advise me on how to turn off all of the lights. Hint this is a linear algebra class so probably linear algebra is involved. You may use a computer to do row reduction, just state where you used technology.
2. Assuming all of the lights in even number rooms are on please advise me on how to turn off all of the lights.