# Simon Game

## [expert]

Have you ever played Simon? The rules are simple: two (or more) lights activate in a random sequence, then you must repeat that sequence back through a matching pair of buttons. Decide which button is for the “red” light and which one is “green”, then program a game of Simon.

### Helpful hints:

* Before you start coding, write out the different things the program needs to do on a piece of paper
* <https://www.arduino.cc/en/Reference/Random> could be useful for making a sequence
* <https://www.arduino.cc/en/Reference/Array> might help store data
* Decide how long the game can be. I recommend length 10 sequences.

### Further extensions:

* Can you make the lights blink faster as the sequence gets longer?
* When I push a button, can you trigger the appropriate light for feedback?
* What should happen when the player wins? When they lose?

# Day/night traffic lights

## [medium]

At night, when the traffic dies down, many traffic lights change to simply flash yellow, warning cars to be cautious. This prevents people from waiting at a red light when no other cars are near the intersection. Can you make your traffic light do this? Every thirty seconds, it should change to flashing yellow.

### Helpful hints:

* Think about where in your code should check for this condition. Is it the exit condition of a loop? An *if* statement? Something else?
* <https://www.arduino.cc/en/Reference/Millis> allows explicit timers, if you want.

### Further extensions:

* What if a pedestrian pushes the button? Does the night mode still activate after exactly 30 seconds?
* In the real world, traffic lights often aren’t turned on at exactly sunrise. How would you calibrate the system to know when night comes?