Consider the task of building an electronic sand glass to act as a timer.
At the press of a button, six LEDs should be on and, at predetermined intervals, each would switch off until they all are off. An extra LED will then be on, to signal that the time was up.
Another button can be used to pause the timer.

Using the supplied material please assemble the following schematic:

LED	Colour
1	green
2	green
3	yellow
4	yellow
5	red
6	red
7	other
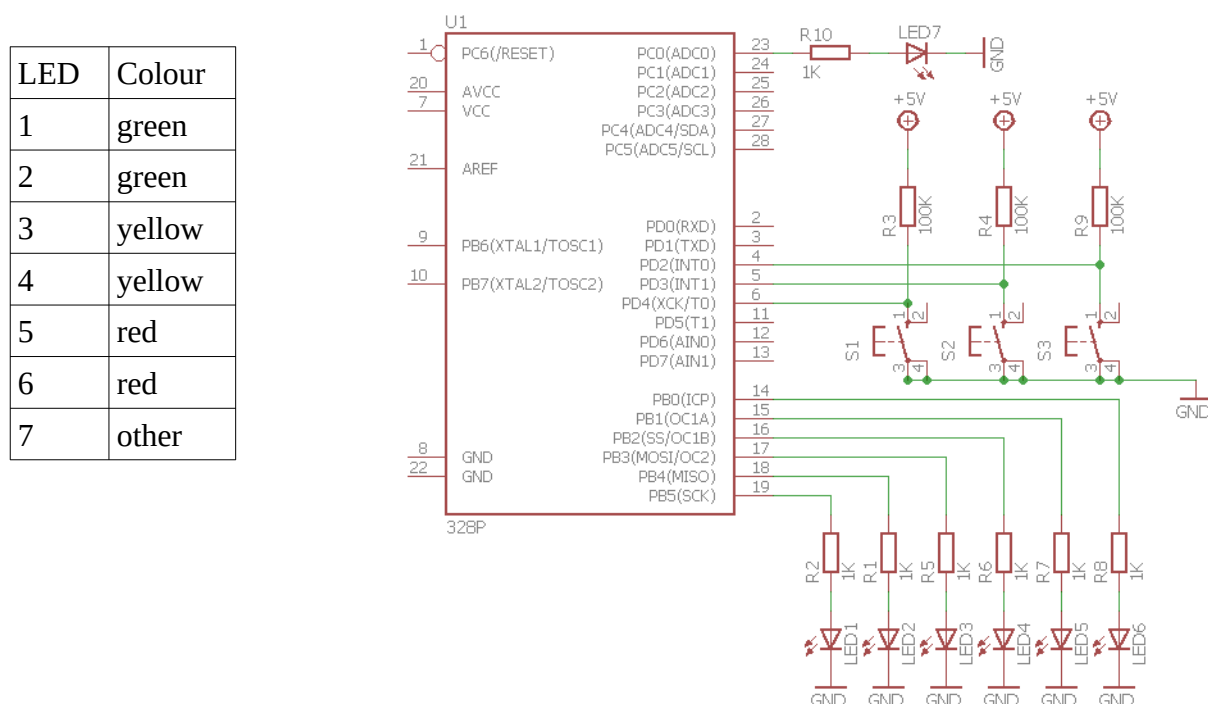
To map the Arduino board pins to the microcontroller pins you can use the image Arduino Uno Pinout.
You can use the supplied Timer library (Timer Library).
Use also the included serial communication library to help debug your program.

LAB1A

Use S1 to reset the timer and S2 to pause/continue it.
The interval between each LED going off should be 2 seconds.
Use the serial port to report each button reading and the current state for each State Machine.

Draw the state machines to implement the desired behaviour and implement them.
They should be in the final report.
The final report must also include a schematic of this circuit built without resorting to an Arduino board.

LAB1B

S3 should change the interval between each LED going off. Each press rotates between 1, 2, 4 and 8 seconds for the interval. When it is changed, use LED7 to present the current interval. Store the current interval in non volatile memory.

For the second half of each interval, the LED that is going to be off must blink.

When the timer is paused the currently lit LEDs must blink.

If S2 is "double clicked" the timer should gain an extra interval (one LED up).

LAB1C

Repeat LAB1B without using the timer library. Use **only** the hardware **Timer1**.