1. Using a Raspberry Pi Pico design an electronic sand glass to act as a timer. In the end, present a small report with the final schematic, the projected finite state machines and the description of the corresponding software implementation.

At the press of a button, five LED from a RGB LED strip should be on and, at predetermined intervals, each would switch off until they all are off. When the predefined time is up all will then fast blink with the red colour.
The timer should be be able to be paused, also the remaining time should be able to be increased while counting down.

The buttons **Sgo**, **Sup** and **Sdown** should be connected to GPIO pins GP2, GP3 and GP4. All buttons should connect their pin to GND when pressed.
The LED strip must be powered by the 5V line and GP6 used for the communication.
Use the serial port to report each button reading, all LED state and the current state for each State Machine.

The next steps go from a simple setup to a more complex one.

a) Use **Sgo** to reset the timer and **Sdown** to pause/continue it.
The default interval between each LED going off should be 2 seconds.
When the timer is paused the currently lit lights must blink.

b) If **Sup** is clicked, the timer should gain an extra interval (one LED up).

c) If there is a long press in **Sup** (pressed for more than 3 seconds) then it should enter configuration mode. Another **Sup** long press should exit the configuration mode and stores the current configuration.
Only one LED must be blinking to signal that it entered configuration mode. Each LED will be associated with a different item to be configured. A **Sup** press changes the item being configured.
Option to be configured:

d) Timer time. (LED1 blinking) Change the interval between each LED going off. Each **Sdown** press, rotates between 1, 2, 5 and 10 seconds for the interval. When it is changed, use the last LED to present the current interval. (turn on LED for the defined interval)

e) Counting effect. (LED2 blinking) The LED that is going to be switched off, will:

* Switch off by the end of its interval.
* For the second half of its interval, the LED must blink.
* Fades out from 100% in the beginning to 0% in the end of the interval.

Each **Sdown** press rotates between these modes, LED5 exemplifies the mode.

f) Counting colour. (LED3 blinking) Choose the default LED colour. The user should be able to chose the colours: violet, blue, cyan, green, yellow, orange or white. LED5 exemplifies the colour.

g) Idle effect. If the timer is idle for more than 30 seconds it should show an idle effect on the LED strip. For the idle effect you can use your imagination to design it...