Practical 4 — The Server-Room Fan

Assignment practice, Lesson 5. Simulate in Yenka first, then build it on the Uno. Answers go in the tables and on your hard copies.

The idea being tested

Build the engineer's design exactly as drawn, faults and all. Your tests find the faults. Your hard copies prove it.

Table 1 — the pins

Pin	2	3	6	7
Part	start switch (in)	stop switch (in)	warning LED (out)	fan motor (out)

The specification

i When **start** is pressed, the warning LED **flashes 3 times**: on 0.5 s, off 0.5 s.

ii Then the **fan runs**.

iii When **stop** is pressed, the **fan stops** and the sequence returns to the start.

The engineer's design

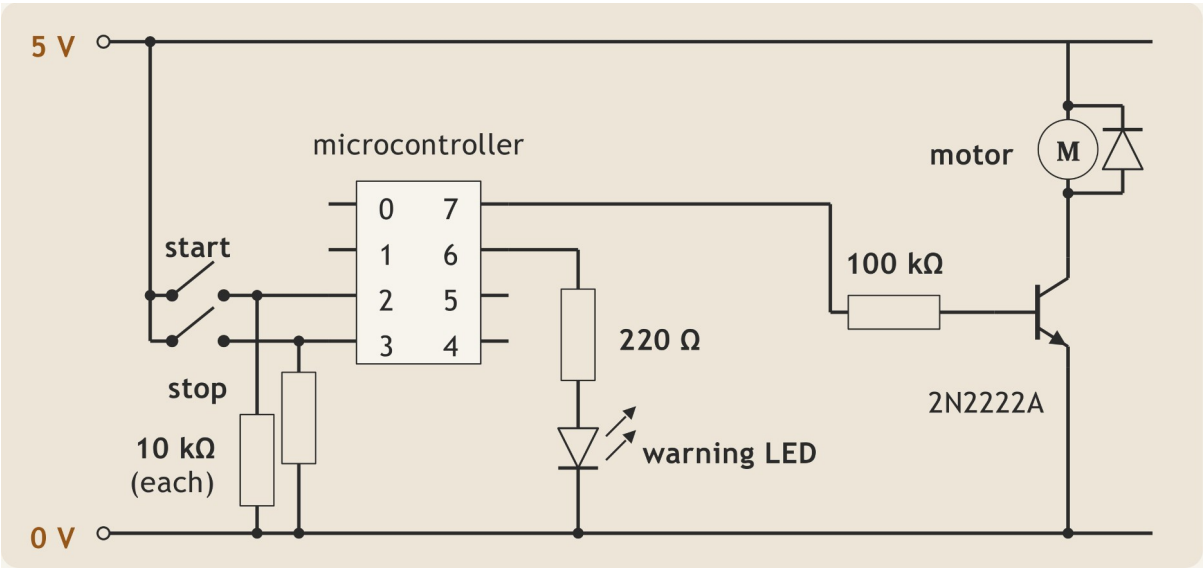


Figure 1 — the circuit

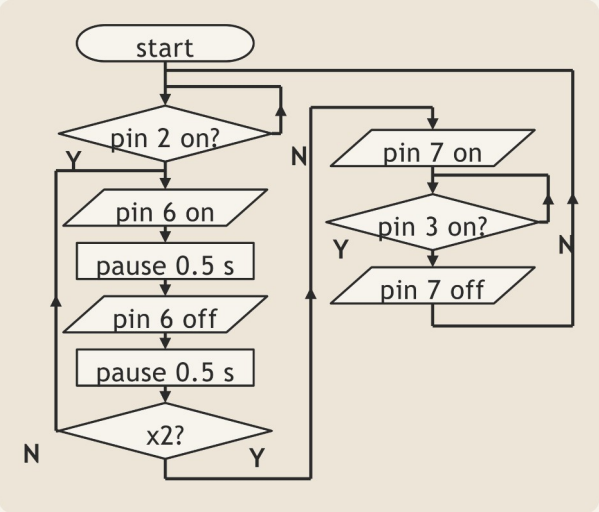


Figure 2 — the flowchart

4a **Simulate** the engineer's design in Yenka **exactly as shown**. **Produce** a **hard copy**: **Task 4a** at the top, your **name** at the foot.

4b **Produce** Arduino C++ that **matches** the flowchart exactly, **pin numbers** included. Typed or generated.

Testing

4c **Carry out** the three **planned tests** in order. **Complete** Table 2. **Amend** and **re-test** as you go. **[5]**

Table 2 — test, amend, re-test

Planned test	Expected result	Initial result	Planned amendment	Re-test result
1 Press start.				
2 Wait after the flashes.				
3 Press stop.				

4d **Produce** a **hard copy** of your **amended** simulation: **Task 4d** at the top, your **name** at the foot. **[2]**

4e **Complete** Table 3. For each specification point, **state** whether it is now **met**, and **justify** it from your tests. **[1]**

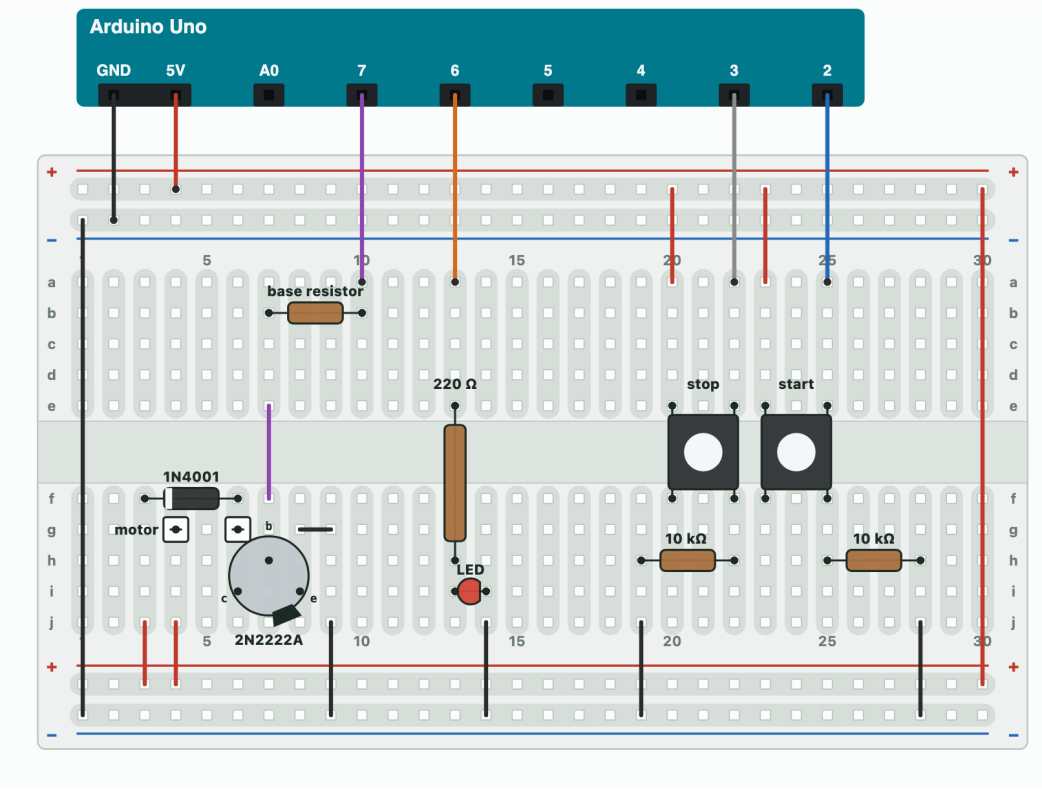
Table 3 — specification met?

Specification point	Met? Yes / No	Justification
i		
ii		
iii		

4f **Suggest** one **improvement** to the fan for the **technician** who looks after the server room. **Justify** it. **[2]**

Build it on the Uno

4g **Build** your **amended** fan on the Uno. **Check** the diode's **band** faces **5 V** before you plug in. **Run** the three tests again.



Base resistor: your amended value. Emitter: the leg by the tab.

Total: 16 marks