

**Problem Statement: Day-1, June 17, 2019 (Monday)**

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**Aim:** To read the switch status, perform operation according to the read value and display on the corresponding LED.

**Description:** As we can see on the Aurum v1.3 board there is a socket for a 4- pin DIP switch (each switch is numbered) and 4-slots for LEDs, numbered 1, 2, 3 and 4.

**Tasks:**

1. If Switch-1 is ON, LED-1 should have the square wave of 50% duty cycle having frequency of 0.5Hz. If Switch-1 is OFF, LED-1 should not toggle.
2. If Switch-2 is ON, LED-2 should have the square wave of 50% duty cycle having frequency of 1Hz. If Switch-2 is off, LED-2 should not toggle.
3. Combine problem 1 and 2. If Switch-1 and Switch-2 both are ON, irrespective of other switches, all LEDs (LED 1-4) should glow (duty cycle 100%).
4. Now, we will include a scaling factor using other two switches. Switch-3 and Switch-4 will give us 4-different combinations. The frequency of the last 2-LEDs (LED-3 and LED-4) will be multiplied by the current setting of the switches. The operation should be:

Switch4	Switch3	Multiplication Factor
OFF	OFF	1
OFF	ON	2
ON	OFF	4
ON	ON	8

**Table 1: Switch-4 and Switch-3 operation**

Switch-4	Switch-3	Switch-2	Switch-1	LED-2	LED-1
OFF	OFF	OFF	ON	OFF	0.5Hz
OFF	ON	OFF	ON	OFF	1Hz
ON	OFF	OFF	ON	OFF	2Hz
ON	ON	OFF	ON	OFF	4Hz
OFF	OFF	ON	OFF	1Hz	OFF
OFF	ON	ON	OFF	2Hz	OFF
ON	OFF	ON	OFF	4Hz	OFF
ON	ON	ON	OFF	8Hz	OFF
X	X	OFF	OFF	OFF	OFF
X	X	ON	ON	ON	ON

**Table 2: Complete operation**

Note: These examples are set as a case of I/O interfacing. Therefore, it is necessary to understand the PORTs before proceeding any further.