VENDING MACHINE WITH 7-SEGMENT DISPLAY USING ARDUINO

L. Kiran Kumar Reddy
levaku.fwc1@iiitb.ac.in

COMETFWC027 IITB Future Wireless Communication (FWC) ASSIGNMENT

July 06, 2025

Abstract

A vending machine uses two push buttons, P_1 and P_2, to select between two products. When a button is pressed, the price of the corresponding product is displayed on a 7-segment display:

- If no buttons are pressed, '0' is displayed, signifying "Rs. 0".
- If only P_1 is pressed, '2' is displayed, signifying "Rs. 2".
- If only P_2 is pressed, '5' is displayed, signifying "Rs. 5".
- If both P_1 and P_2 are pressed simultaneously, 'E' is displayed, signifying an "Error".

Truth Table

P_1	P_2	Displayed Output
0	0	0
0	1	5
1	0	2
1	1	E

Components

Component	**Value**	**Quantity**
Arduino Board	–	1
Jumper Wires	M-F	5
Push Buttons	–	1
Breadboard	–	1
USB Cable	–	1
Seven Segment	–	1

Setup

1. Connect push buttons P_1 and P_2 between Arduino digital pins (e.g., pins 2 & 3) and GND, enabling `INPUT_PULLUP` mode in code.
2. Connect each 7-segment segment pin (a–g) to separate Arduino digital pins through 220–330 Ω resistors; connect the display's common cathode to GND.
3. Write Arduino code to read button states, calculate segment outputs using your logic equations for '0', '2', '5', and 'E'.
4. Control the 7-segment segments with `digitalWrite()` to display the correct digit based on button combinations.

Implementation

1. Initialize pins for buttons (P_1, P_2) as `INPUT_PULLUP` and segment pins (a–g) as `OUTPUT` in `setup()`.

2. Read button states with `digitalRead()` in `loop()`, inverting logic if needed.

3. Compute each segment's on/off state using your logic equations based on P_1 and P_2.

4. Set segment pins with `digitalWrite()` to display the correct digit ('0', '2', '5', or 'E') on the 7-segment display.