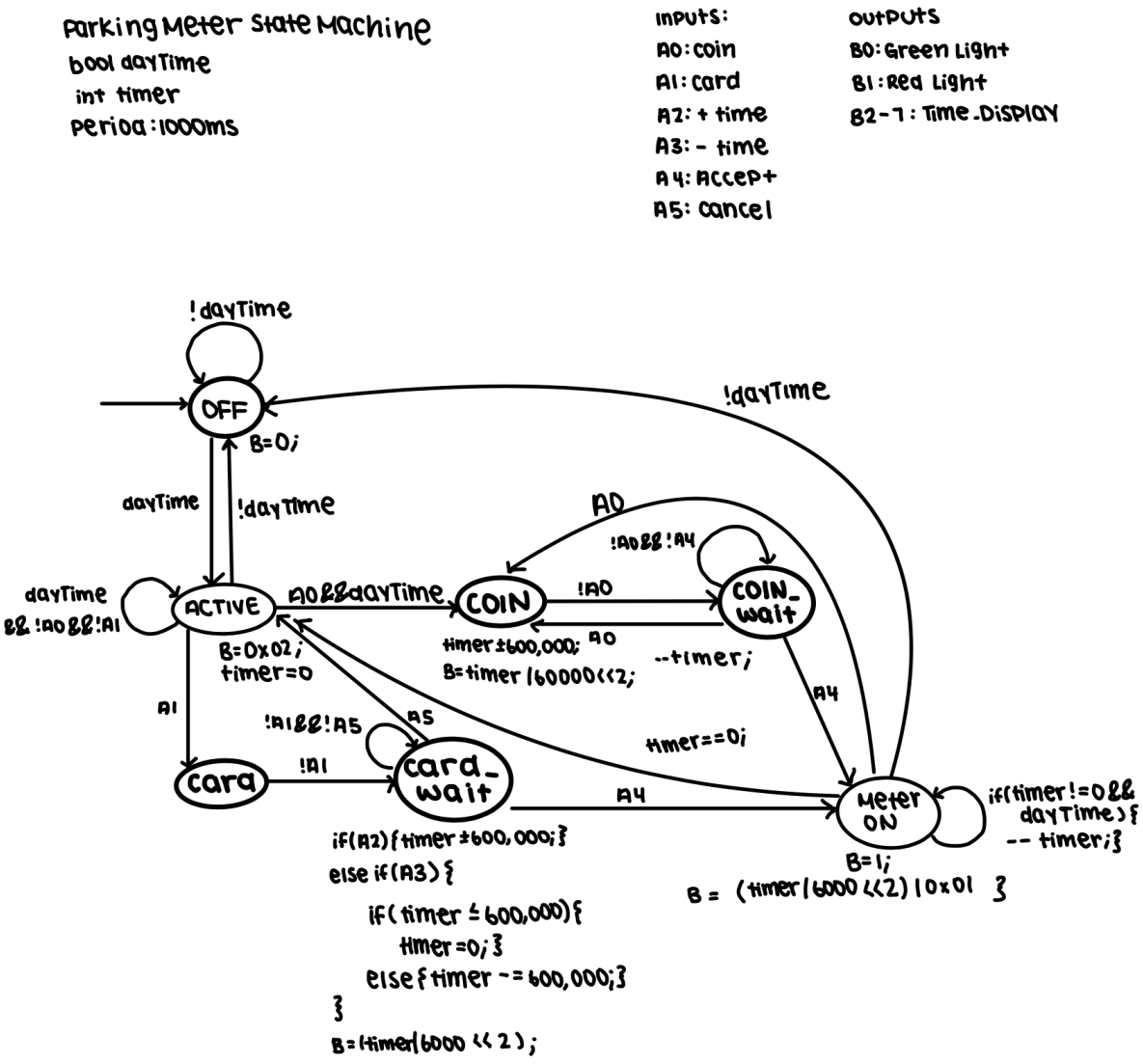
1. **Embedded System Description**

   A real-world embedded system that could be implemented using a state machine is a parking meter that charges $0.25 for 10 minutes. The parking meter is only active during the daytime. When not in use and it is during the day, the parking meter is red(B1) but not in use. When the meter detects a card(A0) or coins(A1) inserted, it will ignore other forms of payment during the process. When the user selected card payment, they will use the up(A2) and down(A3) buttons to choose how much time they want. Once they reach the desired amount, the user can either press cancel(A5) if they don't want to use it or press accept(A4) to turn on the meter. When the user chooses to pay with coins where only quarters are accepted, the meter screen will show how much time they have (B2-B7). The user will insert as much coins as they want and then press accept to start the meter in which case the light will turn green (B1) and the timer will start. When the timer reaches zero, it will return to its initial state and the light will turn red. However, if it is the end of the day, the meter will turn off. If the user wants to add more time, they simply have to pay with coins only.

2. **SM Diagram**



3. Testing Strategy

Cases that tested:

- When it is not daytime, the lights should be off and the meter should not be active.
- The user is able to add more time to the meter even when the meter is already in use using coins.
- The meter should not be able to read coins when the user already swipes the card.
- The up and down button should not work when coins are being inserted and do not change the time on the display.
- The meter should automatically enter the off state when it is the end of the day and the meter is still running.

- Lights should change colors when the meter is running and turn back to red when it is done.