Coding Explanation: Rack and Pinion with (higher end)servo motor - horizontal- 2 + pressure sensor

1. Import libraries

```
import time
from adafruit_crickit import crickit
```

- `time` → used for delays.
- `crickit` → to control motor and read input sensors (limit switches & pressure sensor).

---

2. Seesaw object

```
ss = crickit.seesaw
```

Shortcut for accessing Crickit input pins.

---

3. Pin setup

```
L1 = crickit.SIGNAL1   # Limit switch 1 (fully open)
L2 = crickit.SIGNAL8   # Limit switch 2 (fully closed)
P1 = crickit.SIGNAL5   # Pressure sensor
```

- `L1` → detects **door fully open**.
- `L2` → detects **door fully closed**.
- `P1` → detects **pressure (obstruction / someone pressing sensor)**.

```
ss.pin_mode(L1, ss.INPUT_PULLDOWN)
ss.pin_mode(L2, ss.INPUT_PULLDOWN)
ss.pin_mode(P1, ss.INPUT_PULLDOWN)
```

All pins set as **inputs with pulldown resistors**.

---

4. Motor control functions

```
STOP_VALUE = -0.05
```

Stops motor drift.

```
def motor_stop():
    crickit.continuous_servo_1.throttle = STOP_VALUE
    print("Motor STOP")
```

Stops motor.

```
def motor_reverse():   # opening
    crickit.continuous_servo_1.throttle = -0.7
    print("Motor FORWARD (OPENING)")
```

Opens door.

```
def motor_forward():   # closing
    crickit.continuous_servo_1.throttle = 0.7
    print("Motor REVERSE (CLOSING)")
```

Closes door.

---

5. Start stopped

```
motor_stop()
```

---

6. Main Loop

```
while True:
```

Runs continuously.

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a) Wait for pressure sensor

```
if ss.digital_read(P1):
    print("Pressure detected → opening door")
    motor_reverse()
```

If pressure detected → start **opening door**.

---

b) Keep opening until fully open

```
while ss.digital_read(L1) == 1:
    time.sleep(0.01)
```

Door keeps opening until **L1 switch** (fully open) is triggered.

---

c) Once open → start closing

```
print("Door fully open → start closing")
motor_forward()
```

Door starts closing automatically.

---

d) Safety during closing

```
while True:
    if ss.digital_read(P1):   # SAFETY REVERSE
        print("Pressure detected while closing → reopen immediately")
        motor_reverse()
        break  # break closing loop → reopen again
```

If **pressure is detected while closing →**

- Motor reverses (opens immediately).
- Prevents accidents (safety feature).

```
if ss.digital_read(L2) == 0:   # fully closed
    print("Door fully closed → stop")
    motor_stop()
    break
```

If **door is fully closed** → stop motor.

---

7. Final short delay

```
time.sleep(0.05)
```

Small delay to avoid excessive CPU usage.