Requirements MicroWaveOven

Wednesday, October 29, 2025 9:44 PM

Example 9 — Microwave Oven (Idle / Cooking / DoorOpen / Done)

🎯 Goal

Model a microwave with 4 states and realistic user actions.

🧱 States

State	Meaning
Idle	Ready, door closed, nothing running
Cooking	Timer running, magnetron on
DoorOpen	Door opened (safety pause)
Done	Cooking finished, waiting for user

⚙️ Events

- openDoor()
- closeDoor()
- startCooking(int seconds)
- tick() – one second passes
- cancel() – stop early

🔐 Rules

Idle →

- startCooking(t) → if door closed and t > 0 → **Cooking** (Cooking for t seconds…)
- openDoor() → **DoorOpen** (Door opened)
- cancel() → (No effect)

Cooking →

- tick() → decrement remaining;
  if > 0 → <n> s left
  else → **Done** (Ding! Done.)
- openDoor() → **DoorOpen** (Cooking paused)
- cancel() → **Idle** (Cooking stopped)

DoorOpen →

- closeDoor() → **Idle** (Door closed)
- startCooking() → Cannot start: door open

Done →

- openDoor() → **DoorOpen** (Take food out)
- cancel() → **Idle** (Reset to ready)

✅ Acceptance tests

1️⃣ Normal cook

startCooking(3)
tick()
tick()
tick()
→

Cooking for 3 seconds…
2 s left

1 s left
Ding! Done.

2 Open door midway

startCooking(5)
tick()
openDoor()
closeDoor()
startCooking(2)
tick()
tick()
→

Cooking for 5 seconds…
4 s left
Cooking paused
Door closed
Cooking for 2 seconds…
1 s left
Ding! Done.

3 Cancel early

startCooking(5)
tick()
cancel()
→

Cooking for 5 seconds…
4 s left
Cooking stopped