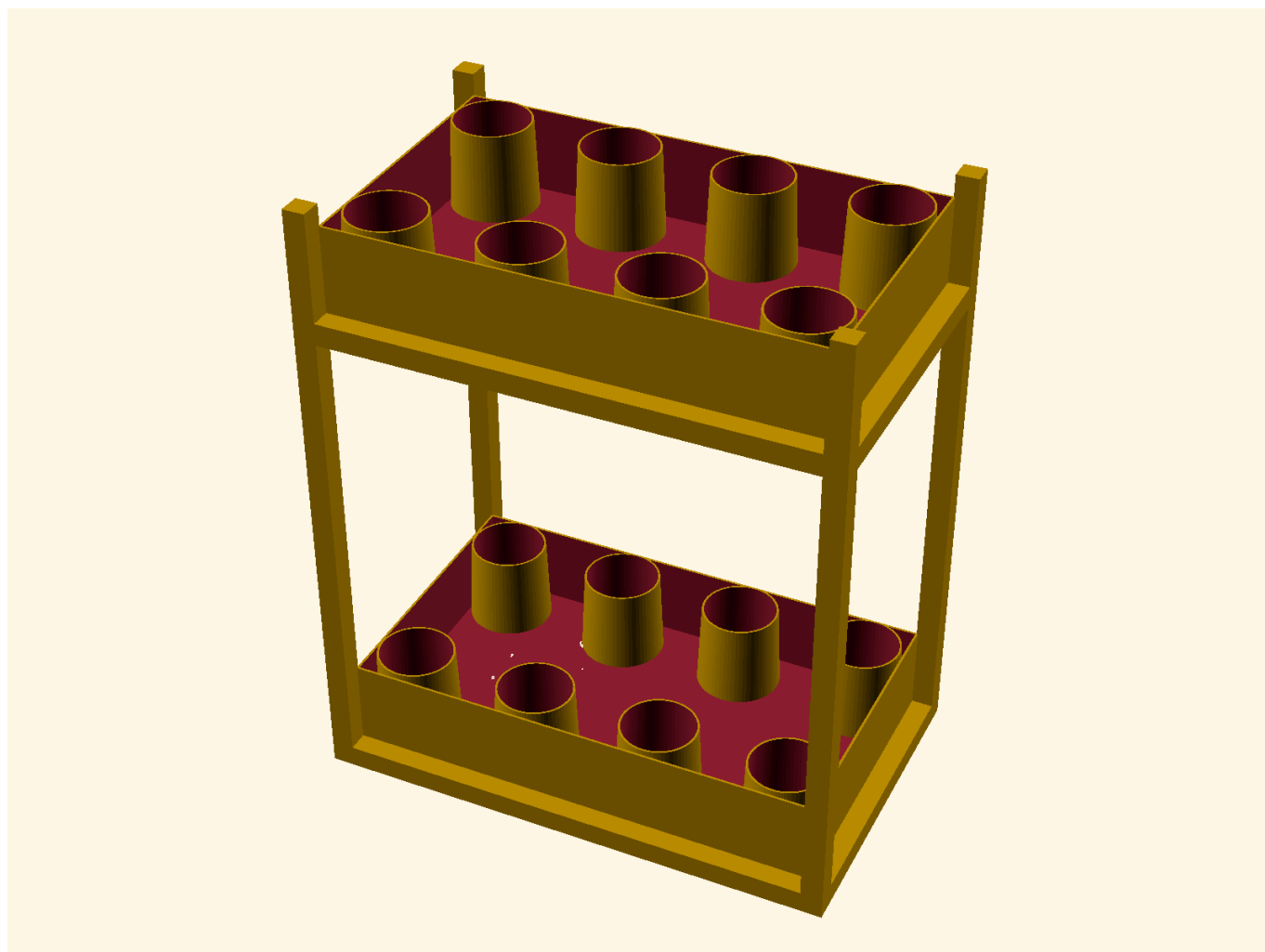


Window-Sill LED Grow Shelf – GridBeam Edition

Window-Sill LED Grow Shelf

GridBeam Edition (v4.1)



Modular indoor garden built from wood, light, and logic.

1 — What This Is

A **two-level herb garden** for any windowsill.

Built using the **GridBeam tri-joint system**.

Each tray holds eight pots; the top tray lights the lower one with **5 V LEDs**.

All parts are re-usable, screw-based, and repairable.

Size: 40×23×46 cm **Capacity:** 16 pots **Power:** 5 V DC

Skill: Beginner / Maker

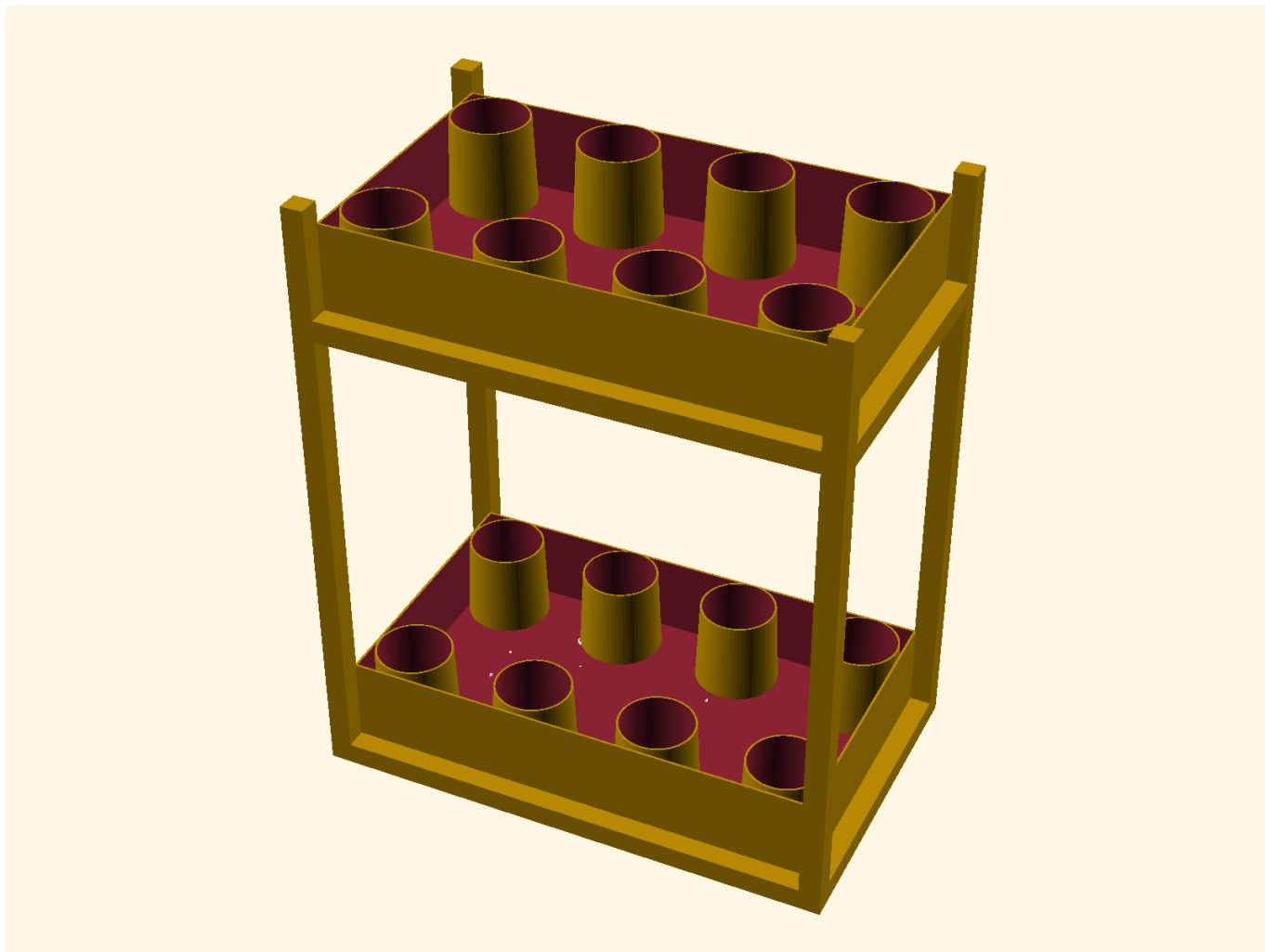


Figure 1: Rendered model

2 — Why GridBeam

Three beams meet at one node — X, Y, Z — forming a reusable tri-joint. GridBeam uses one beam profile, holes every 25 mm, and M5 bolts. It's fast, strong, and circular-economy friendly.

3 — Bill of Materials

Frame - 4 m of 18×18 mm pine/beech

- 4 × 400 mm (X), 4 × 230 mm (Y), 4 × 450 mm (Z)
- 24 × M5 bolts + nuts + washers

Trays & Pots - 2 × baking trays (39×23×7 cm)

- 16 × pots Ø 70 mm × H 80 mm
- Potting soil

Lighting - 1 m 5 V red/blue LED strip

- 5 V 2 A adapter, 22 AWG wire
- Heat-shrink, solder, digital timer, extension lead

4 — Tools

Saw / mitre box • Drill (5 mm) • Screwdriver or spanner

Solder iron • Heat-gun • Multimeter • Square • Tape • IPA cleaner

5 — Build the Frame

1. **Drill holes** every 25 mm on beam centerlines (Ø 5 mm).
2. **Bolt base corners:** X + Y + Z beams form each tri-joint (3 bolts).
3. **Add upper rails** 310 mm above lower tray.
4. **Seat trays** flat on beam tops (15 mm wall gap).

6 — Add Pots & Soil

Each tray holds 8 pots (2×4) with 35 mm gap from walls.

Fill with soil and herbs (basil, mint, thyme).

Cut drainage holes if using tetra packs.

7 — LED Wiring

1. **Cut strip** to fit tray underside (35 cm runs).
2. **Solder** red to +5 V, black to −; join segments with jumpers.
3. **Insulate** with heat-shrink; test polarity.
4. **Clean and stick** strip under upper tray; glue ends if needed.
5. **Power** via adapter → timer → wall.
Set timer: 12–14 h ON (winter) / 8–10 h ON (summer).

8 — Safety & Use

Keep electrics dry; route cables down rear post.

Tighten bolts monthly, trim plants weekly.

Optional: foil reflector or PWM dimmer.



LED Circuit Sketch

+5V Adapter → Timer → LED Strips

Red → +5 V Black → GND

Quote

> “Make it modular, make it honest, make it easy to rebuild.”