Task list

Task	Notes / Done	SP
Design simulation state machine	Diagram + unit test transitions	2
Implement physics stepper for vertical motion (Rust, fixed, delta t)	Ball position/velocity updates correctly for Earth-g	3
Wire Run/Pause button (text toggles, disables at end)	UI reflects state within 50 ms	1
Wire Run/Pause button (text toggles, disables at end)	UI reflects state within 50 ms	1
Reset button & “R” hot-key	Restores initial state, clears timer	1
Display live t, y, v read-outs	Text updates every frame, freezes on pause	2
Smoke-test + CI workflow (cargo test, lint, WASM build)	Green pipeline on push	1
Add slider component (range -20…+20 m/s, live tooltip)	Debounce <= 50ms	2
Add numeric input (two-way bound to slider, clamps to range)	Invalid text -> reverts	2
Draw velocity arrow gizmo on ball	Length - v_0 updates live	1
Persist v_0 across resets	Reset uses last chosen v_0	1
Unit/property tests (clamping, negatives)	Edge cases pass	1
Implement g store + presets (Earth, Moon)	UI radio- buttons/segmented control	1
Custom g input (- 20…+20 m/s^2, validation)	Out-of-range inline error	2
Hook g into physics stepper	Trajectory visibility different per g	1
Ensure g updates on next	Spec confirmed	1

Reset only (not mid-flight)		
Snapshot/visual tests for Earth vs moon	CI pass	1
Responsive layout (sidebar controls + canvas)	Looks good >= 320 px	2
Performance budget (>= 60 fps on mid-tier laptop)	Profile + fix > 5 ms frames	3
Basics docs & demo page (README gifs)	Ready for coursework submission	2