

# Assignment 3 — Mario-Style Platformer

## Specification & Scoring Rubric

**Goal.** Build a 2D platformer (Mario-style or your own theme) that demonstrates **smooth scrolling, basic combat, items/power-ups, a boss encounter, audio, and a usable menu**—using **Cocos2d, Pygame, PySDL2**, or any engine that you're familiar with.

### 1) Technical baseline

- 1 **Language/engine:** Python with Pygame/PySDL2, Cocos2d, or anything; pick one and stick to it.
- 2 **Target resolution:** **1280×720 (recommended); support other 16:9 sizes.**
- 3 **Frame rate:** Aim for **60 FPS**; degrade gracefully.
- 4 **Controls (minimum):** Left/Right (or Up/Down if vertical), Jump, Action/Attack, Pause/Escape.
- 5 **Physics:** **Simple gravity & collision with platforms/tiles** are sufficient.

### 2) World & camera (3 pts total)

- 1 **Map size  $\geq 4\times$  screen area (1 pt):** Example: 5120×720 (horizontal) or 1280×2880 (vertical). Player can traverse beyond a single screen.
- 2 **Scrolling on one axis (2 pts):** Horizontal or vertical camera follow; clamp at world edges; **avoid jitter via smoothing or tile-aligned** steps.

### 3) Core interactions (3 pts total)

- 1 **Enemy defeat (1 pt):** **At least one** enemy vulnerable to a specific tactic (e.g., jump-stomp) with visual/audio **feedback** and removal/state **change**.
- 2 **Breakable containers (1 pt):** Crates/**blocks that break** via jump/attack and **spawn items**; **update collision boxes** after breaking.
- 3 **Coin collection (1 pt):** **Coins with pickup sound** and on-screen counter; persist count across the level.

### 4) Special objects (2 pts total)

- 1 **Boss (1 pt):** Distinct enemy **with HP, patterns, a telegraphed weak phase, and a clear win condition**. Show boss HP; provide hit feedback.
- 2 **Star (1 pt):** Temporary **power-up (~5–10 s)** granting invulnerability/speed with **unique** visual and jingle; **show timer/icon**.

### 5) Audio & menu (2 pts total)

- 1 **Audio (1 pt):** **Looping BGM** per level; **SFX for jump, coin, crate break, enemy hit/defeat, star pickup, pause, confirm**. Options for volume preferred.

- 2 **Menu (1 pt):** Main Menu with New Game, Options, About, Exit; Options includes at least Music/SFX volume; About shows team, credits, controls.

## 6) Game structure & UX

States: Splash (optional) → Main Menu → Gameplay → Pause → Win/Lose → Back to Menu.

Recommended: simple checkpoints; HUD shows Lives/HP, coins, optional timer, star/buff indicator, and (for boss fights) boss HP.

## 8) Scoring rubric (10 pts)

Category	Points
Map & movement	3
Interactions (enemy/boxes/coins)	3
Special objects (boss + star)	2
Audio & menu	2

## 9) Bonus ideas

- 1 Multiple enemy defeat methods (e.g., stomp and projectile; parry; lures).
- 2 Environmental puzzles that require moving objects to progress (bridges, numbered tiles, pressure plates).
- 3 Polish: particle effects, camera shake, squash-and-stretch, animation blending, save/load.
- 4 Accessibility: color-blind safe UI, remappable keys.

## 10) Deliverables & submission

- 1 Source code + README.md (how to run, controls, engine version).