RPG Gold Economy Simulation

Project Overview:
This project models a basic role-playing game (RPG) economy where players earn gold by defeating monsters and spend it on weapon upgrades. The purpose is to understand and visualize how player effort (fighting monsters) relates to progression pacing (upgrade affordability). **Core Design Loop:**
Fight monsters → Earn gold → Buy upgrades → Fight tougher monsters → Repeat.

Economy Parameters:
- **Soft Currency:** Gold
- **Gold Reward:** 10 × Monster Level
- **Upgrade Cost:** 50 × (Level²)
- **Monsters per Level:** 5 + Level
These formulas ensure early upgrades are cheap but grow in cost as levels increase, simulating difficulty progression.

Balance Analysis:
By modeling player progression over 10 levels, the spreadsheet reveals a healthy early-game loop but a steeper late-game curve. If the upgrade cost rises too fast, players experience grind fatigue. Conversely, too low costs make progression trivial. Adjusting the reward multiplier (e.g., 15 × Level) or lowering cost scaling can stabilize pacing.

Visualization:
The accompanying chart compares *Cumulative Gold* vs. *Upgrade Cost* per level. Ideally, the curves should intersect occasionally, maintaining tension and satisfaction as players progress.

Tools Used:
- Google Sheets / Excel for simulation and formulas.
- Python for generating data and visualization.
- ReportLab for documentation.

Future Improvements:
- Add a secondary currency for cosmetics or rare items.
- Simulate playtime per level to estimate session pacing.
- Introduce rarity tiers for rewards and drops.

Conclusion:
This project demonstrates an understanding of core economy design principles — resource flow, player motivation, and balance tuning — using simple yet effective modeling.

RPG Economy Balance Curve