Shop Simulation: A Python Business Simulation Project

- Four-session project

- Build a text-based business simulation game in Python

- Assume the role of a shop owner

- Make strategic decisions regarding inventory, upgrades, and customer service

- Observe the progression of the business

- Apply and combine Python skills

What You'll Build: A Shop Simulation

Core Gameplay Loop

Daily business flow involves managing inventory, customers, and revenue.

Strategic decisions include prioritizing upgrades versus savings for business development.

Buy Inventory

Acquire stock

Serve Customers

Process orders

Earn Revenue

Generate income

Upgrade Equipment

Enhance tools

Final Product: A Complete Business Simulation

Multi-Day Progression

Day-night cycle. Tracks business development and progress.

Persistent Save System

JSON save/load. Retains game progress and statistics.

Detailed Analytics

Tracks revenue, sales, customer patterns, and upgrades.

Dynamic Pricing

Pricing adjusts based on market, skill, and upgrades.

Learning Paths: Challenge Levels

Two parallel learning tracks.

Identical game, different coding depth.

Paths can be switched anytime without penalty.

Normal Version

Core Python concepts:

- Variables, dictionaries, lists
- Functions, conditionals, loops
- Focus on logic and flow
- Clear, readable code

Extended Version

Object-oriented programming (OOP):

- Classes, objects, methods
- Inheritance and abstraction
- Professional software design
- Advanced analytics, error handling

Session 1: Core Business Concepts

Money

Starting Capital & Balance

Inventory

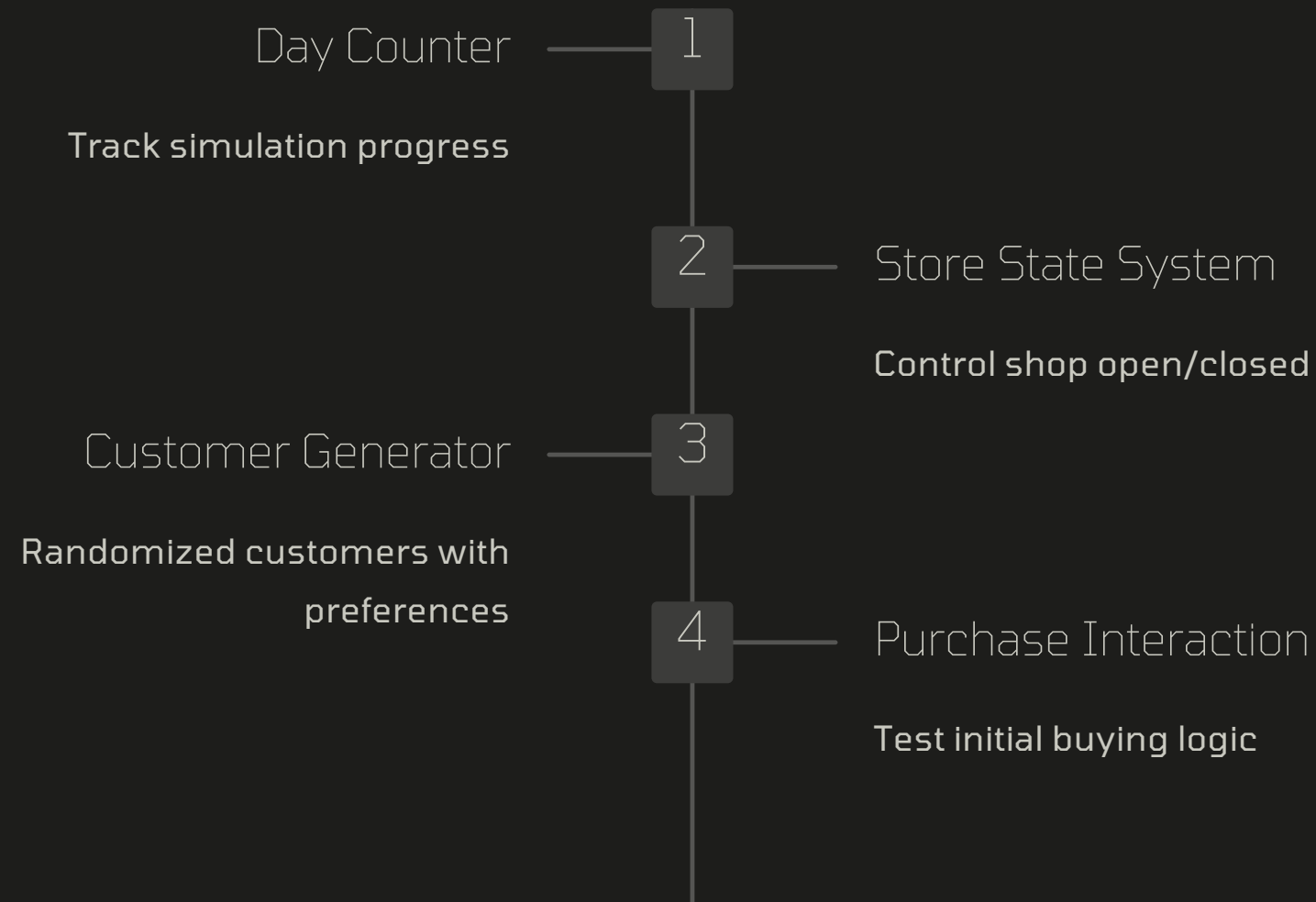Stock via Dictionary

Buy

Purchasing from Supply

Pricing

Dynamic Selling Prices

Extended Challenge: Shop class encapsulates state and implements buying methods, introducing OOP.

Session 2: Opening Your Doors to Customers

1 Day Counter

Track simulation progress

2 Store State System

Control shop open/closed

3 Customer Generator

Randomized customers with preferences

4 Purchase Interaction

Test initial buying logic

Extended Path: Create Customer class (name, budget, items). Shop class gains methods for opening, closing, and advancing days.

Session 3: Implementing Upgrades

Implement upgrades for business development.

 Coffee Machine

Enables new products and improves profit margins.

 Manager

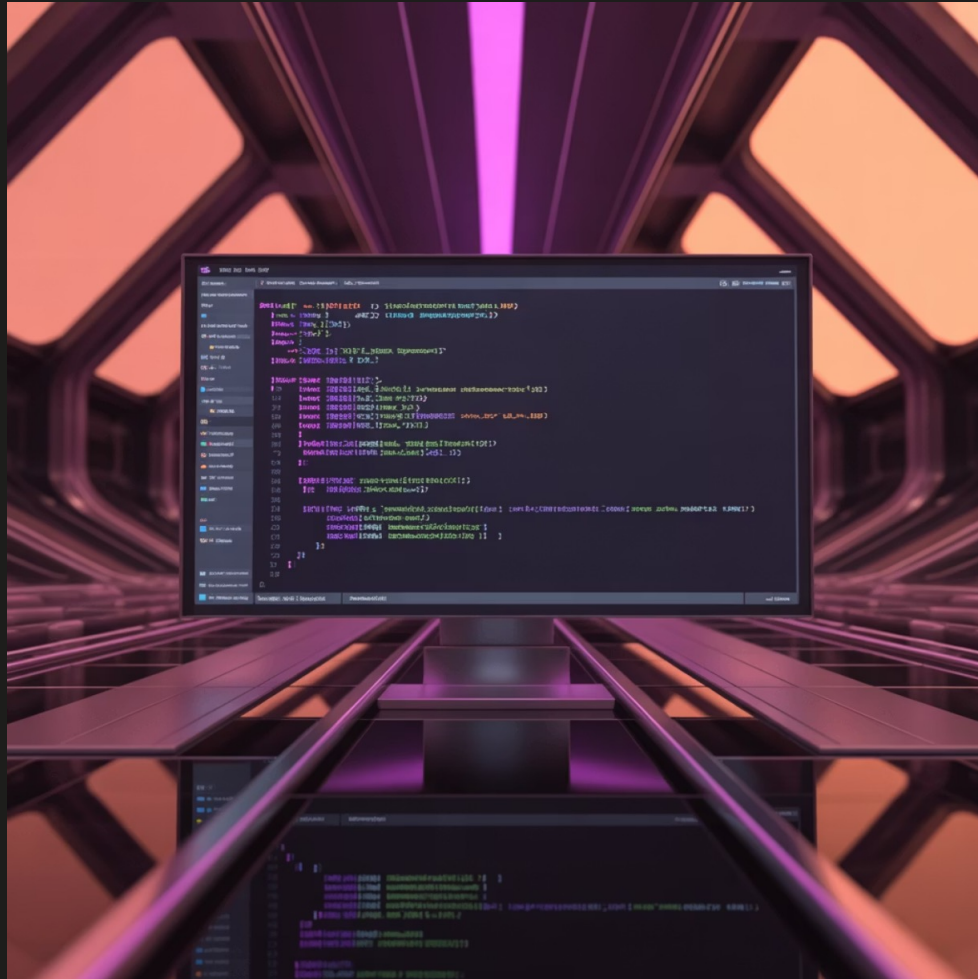Improves pricing strategies and operational efficiency.

 Store Decoration

Attracts different customer segments and increases transaction value.

Daily simulation logic: process customers, track sales, calculate revenue, analyze performance statistics.

> ▢ Extended Challenge: Build an Upgrade class hierarchy with base upgrade properties and specialized subclasses for each type. Implement a sales log that records every transaction with timestamps and details.

Session 4: Data Persistence and Code Refinement

1 JSON Save System

Implement persistent game state

2 Load Functionality
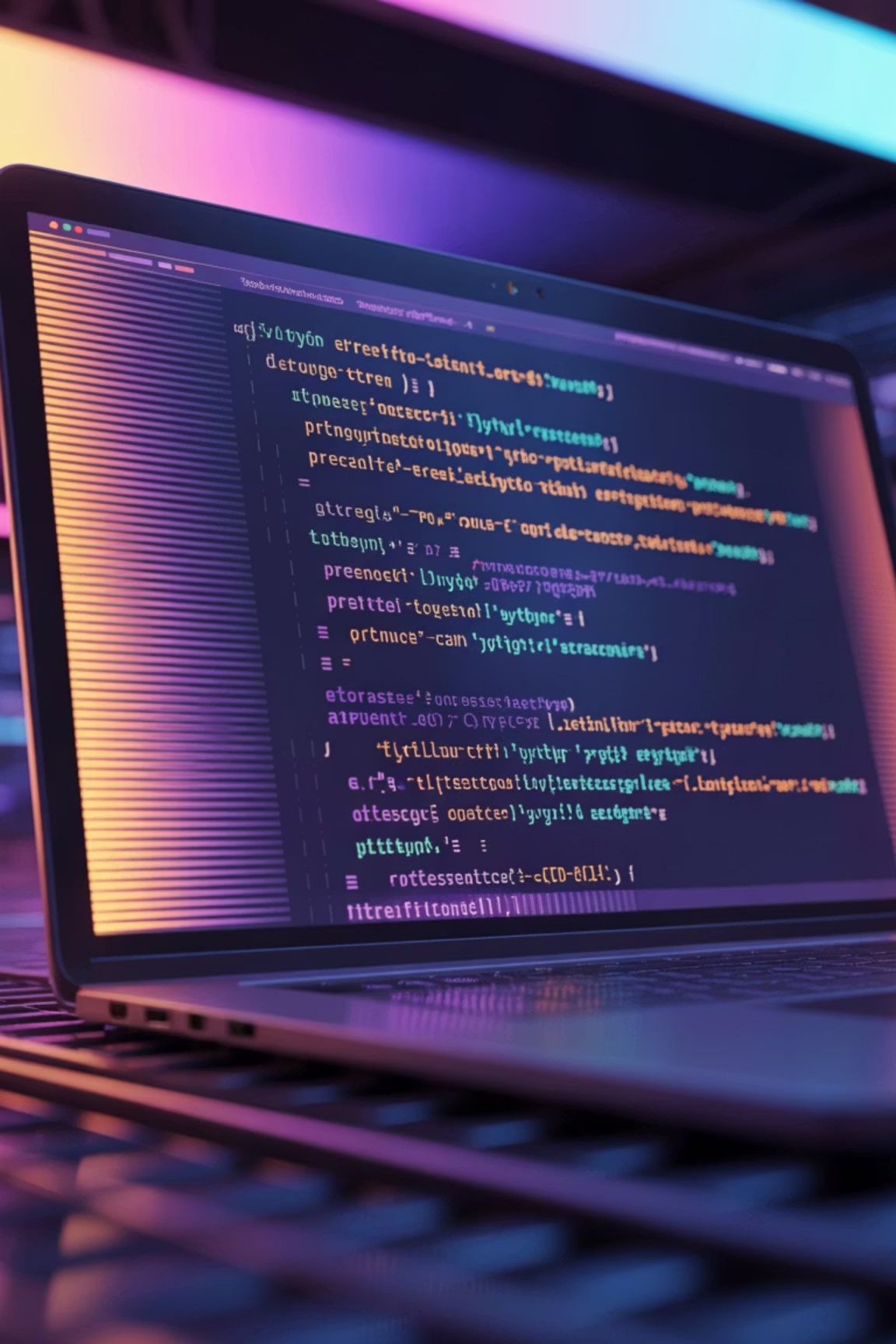
Integrate functionality to restore saved game data

3 Statistics Dashboard

Develop performance metrics and visualization tools

4 Code Refinement

Apply practices for clean, readable, and organized code

Key Skills and Learning Outcomes

10+
Core Concepts
Variables, functions, loops, conditionals, dictionaries, lists

4
Building Sessions
Progressive complexity, simple to sophisticated systems

100%
Practical Application
Concepts with clear purpose

Technical Skills

- Data structure design
- Function composition
- State management
- File I/O and JSON
- Random generation
- Formula implementation

Problem-Solving

- Deconstruct complex systems
- Debug multi-step processes
- Balance game mechanics
- Optimize code structure

Software Design

- Modular code organization
- Clean, readable syntax
- Professional practices
- Optional OOP patterns

Project: Business Simulation Development

This project applies Python skills to build a complete, playable simulation. Students will create a portfolio-worthy project and gain a deep understanding of software principles.

1 Session 1

Foundation: Money & Inventory

2 Session 2

Simulation: Days & Customers

3 Session 3

Gameplay: Upgrades & Sales

4 Session 4

Professional: Save & Statistics