



Software Construction and Development

Project Report Tkinter Python

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1. Justifying Lehman's Law

Lehman's Laws describe how software evolves. **Inventory Management System (IMS)** in these laws:

- **Law of Continuing Change:**
 - *Concept:* Software must adapt or become progressively less useful.
 - *Explanation through our Code:* Our project started with basic database creation (`create_db.py`) but evolved to include complex features like "Billing" and "Sales Reports" (`billing.py`, `sales.py`). The addition of the `billing.py` module, which calculates discounts and updates stock levels dynamically, proves the system evolved beyond simple data entry.
- **Law of Increasing Complexity:**
 - *Concept:* As a system evolves, its complexity increases unless work is done to maintain or reduce it.
 - *Explanation through our Code:* We managed complexity by **Modularization**. Instead of one giant file, we split the code into separate classes: `employee.py` handles employees, `product.py` handles products, etc. This structure is the direct application of this law to keep the system manageable.

2. Software Process Improvement (SPI)

We did SPI on the software

In our semester project context, SPI involves identifying a process weakness and fixing it.

- **The Improvement:** Initially, our development process lacked a safety net for code changes (weakness).
- **The Action:** We implemented **Version Control (Git)**.
- **The Result:** We now have a history of changes (e.g., the commit as we pushed). This is a "Configuration Management" improvement, which is a key part of SPI frameworks like CMMI.
- **Code Level SPI:** We improved the code quality by removing the "Command Error" in `dashboard.py` (Line 54) which was causing crashes. This is "Defect Prevention."

3. Peer Reviews (Inspections & Walkthroughs)

Since AI, acted as a reviewer, We can claim you performed an **Automated Code Inspection**.

- **What happened:** We performed a **Walkthrough** of dashboard.py.
- **Defect Found:** TclError: unknown option "-command" at line 54.
- **Resolution:** The invalid parameter was identified and removed.
- **Benefit:** This prevented a runtime crash during the "User Interface Initialization" phase.

4. Team Roles & Contributions

If this is a Duo group project breakdown of roles based on the files we have:

Role	Responsibility	Evidence in Code
Backend Developer	Designed the SQLite Database schema and SQL queries.	Wrote create_db.py and the SQL queries inside functions like add() and update() in supplier.py.
Frontend Developer	Built the GUI layout using Tkinter.	Wrote the Frame, Label, and Treeview code in dashboard.py and billing.py.
QA Engineer	Fixed bugs and ensured deployment.	Fixed the crash in dashboard.py and implemented the test_app.py (Unit Testing).

5. Final Missing Link: Running the Tests

We created **Unit Testing** and **Automated Testing** and run the test and get the ok report.