

Personal Productivity Suite

A Complete Developer-Grade Python Productivity Toolkit

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Project Overview

The **Personal Productivity Suite** is a multi-tool Python application designed to help users manage daily tasks efficiently.

This project was built as part of the **Developers' Arena Python Developer Internship (Month 1 – Task 1)**.

The suite includes:

-  Calculator
-  Notes Manager (JSON Storage)
-  Timer
-  File Organizer
-  Backup Manager
-  Unit Converter
-  Streamlit GUI Interface

The application follows **modular architecture, object-oriented programming, and persistent data storage** using JSON, text files, and CSV.

Objectives

1. Build a real-world Python project using **OOP, file handling, JSON persistence, and clean architecture**.
2. Provide both **CLI** and **GUI (Streamlit)** interfaces.
3. Demonstrate **modularity, error handling, and Python best practices**.

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4. Prepare a fully deployable GitHub-ready codebase.

Specifications

✓ Calculator

- Safe mathematical expression evaluation
- Prevents malicious expressions using `ast`
- Works with `+, -, *, /, %, parentheses, power, etc.`

✓ Notes Manager

- Create, edit, delete, search notes
- JSON-based persistent storage
- Export notes to `.txt`

✓ Timer

- Countdown timer
- Stopwatch functionality
- Logs history

✓ File Organizer

Automatically organizes files into categories:

- Images
- Videos

- 
- Documents
 - Audio
 - Archives
 - Others

✓ Backup Manager

- Creates timestamped project backups
- Restores backups

✓ Unit Converter

- Length (km ↔ m ↔ cm)
- Weight (kg ↔ g ↔ mg)
- Temperature (C ↔ F ↔ K)

✓ Streamlit GUI (gui.py)

- Sidebar menu for tool selection
- Fully working web UI
- Easy to use for non-technical users

Installation and Setup

Option 1 — Install using virtual environment (Recommended)

```
cd productivity-suite
python -m venv venv
venv\Scripts\activate      # Windows
```



```
source venv/bin/activate # Mac/Linux
```

Install required packages:

```
pip install -r requirements.txt
```

Option 2 — Run without venv

Simply install dependencies globally:

```
pip install -r requirements.txt
```

How To Run The Project

👉 Run CLI version

```
python main.py
```

👉 Run GUI (Streamlit) version

```
streamlit run gui.py
```

Project Structure

```
productivity-suite/
├── main.py
├── gui.py
├── requirements.txt
├── README.md
└── modules/
    ├── __init__.py
    ├── calculator.py
    ├── notes_manager.py
    ├── file_organizer.py
    └── backup.py
```

```
|   ├── timer.py  
|   ├── unit_converter.py  
|   ├── utils.py  
|   └── data/  
|       └── notes.json  
|   └── docs/  
└── tests/  
    ├── test_calculator.py  
    └── test_notes.py  
└── examples/  
    └── sample.txt
```

Module Explanation

🧩 calculator.py

- Uses `ast` for safe evaluation
- Exposes `evaluate_expr(expression: str)`
- Prevents execution of harmful Python code

📍 notes_manager.py

- Stores notes in `modules/data/notes.json`
- Supports add, edit, delete, search, export
- Auto-generates timestamps

📍 file_organizer.py

- Organizes files into folders based on extension

- 
- Uses dictionary-based mapping structure
 - Creates folders automatically

📌 **timer.py**

- Stopwatch and Countdown classes
- Uses threading-safe time loops
- Logs to `modules/data/timer_log.txt`

📌 **backup.py**

- Creates compressed `.zip` backups
- Stores them inside `/backups` folder
- Restore functionality included

📌 **unit_converter.py**

- Converts length, weight, temperature
- Clean function-based architecture

📌 **utils.py**

- Shared helper functions
- Safe input handling
- Path validation
- Timestamp generator

Technical Requirements

Requirement	Implemented	Where
Modular Architecture	✓	<code>modules/*.py</code>
JSON File Operations	✓	<code>notes_manager.py</code>
CSV File Handling	✓	Notes export + test logs
TXT File Handling	✓	Exports
Error Handling Everywhere	✓	All modules
Object-Oriented Design	✓	Timer, NotesManager
GUI Frontend	✓	<code>gui.py</code> using Streamlit
Unit Testing	✓	<code>tests/test_calculator.py</code> + <code>test_notes.py</code>
Clean Folder Structure	✓	Matching internship requirement

Troubleshooting Guide

! *ModuleNotFoundError: No module named "modules"*

Run from project root:

```
cd productivity-suite
python -m tests.test_calculator
```

! Streamlit not found

Install:

```
pip install streamlit
```

! Notes not saving

Delete corrupted file:

```
modules/data/notes.json
```

It will auto-regenerate.

Future Improvements

- Add SQLite database
- Add password-protected notes
- Add cloud backup
- Add AI reminder generator
- Add calendar integration

Image Proof

Modular testing

```
PS D:\productivity-suite> python -m pytest
=====
platform win32 -- Python 3.13.2, pytest-9.0.2, pluggy-1.6.0
rootdir: D:\productivity-suite
plugins: anyio-4.9.0
collected 2 items

tests\test_calculator.py .
tests\test_notes.py .

=====
2 passed in 0.10s
[ 50%]
[100%]

PS D:\productivity-suite> []
```

```
PS D:\productivity-suite> python main.py
=====
PERSONAL PRODUCTIVITY SUITE
=====

MAIN MENU:
1. Calculator Tool
2. Notes Manager
3. Timer & Stopwatch
4. File Organizer
5. Unit Converter
6. Backup & Restore
7. Exit

Enter your choice (1-7): 1

CALCULATOR MENU:
1. Evaluate Expression
2. View History
3. Back to Main Menu

Choice: 1
Enter expression (e.g. 2+3*sin(0.5)): sin(4)
Result: -0.7568024953079282

CALCULATOR MENU:
1. Evaluate Expression
2. View History
3. Back to Main Menu

Choice: 2
1. sin(4) = -0.7568024953079282

CALCULATOR MENU:
1. Evaluate Expression
2. View History
3. Back to Main Menu

Choice: 1
In 1 Col 8 Spaces: 4 HOME END PAGE [1] Python [2] 3.13.2 (venv)
```

```
=====
PERSONAL PRODUCTIVITY SUITE
=====

MAIN MENU:
1. Calculator Tool
2. Notes Manager
3. Timer & Stopwatch
4. File Organizer
5. Unit Converter
6. Backup & Restore
7. Exit

Enter your choice (1-7): 2

NOTES MANAGER:
1. View All Notes
2. Add New Note
3. Search Notes
4. Edit Note
5. Delete Note
6. Export Notes
7. Back to Main Menu

Enter choice: 1
ID: 1 | Title: Myself | created: 2025-12-12 13:34:52

Press Enter to continue...
```

```
Enter choice: 3
Search query: What is the content of 'MySelf' note ?
No matches.
```

```
=====
PERSONAL PRODUCTIVITY SUITE
=====

MAIN MENU:
1. Calculator Tool
2. Notes Manager
3. Timer & Stopwatch
4. File Organizer
5. Unit Converter
6. Backup & Restore
7. Exit

Enter your choice (1-7): 3

TIMER & STOPWATCH:
1. Start Timer (countdown)
2. Start Stopwatch
3. Back to Main Menu

Choice: 1
Enter seconds for countdown: 10
Time left: 3 secc
```

```
Choice: 2
Stopwatch started. Press Enter to stop.

Elapsed: 3.03 seconds

TIMER & STOPWATCH:
1. Start Timer (countdown)
2. Start Stopwatch
3. Back to Main Menu

Choice: 
```

```
=====
PERSONAL PRODUCTIVITY SUITE
=====

MAIN MENU:
1. Calculator Tool
2. Notes Manager
3. Timer & Stopwatch
4. File Organizer
5. Unit Converter
6. Backup & Restore
7. Exit

Enter your choice (1-7): 4

FILE ORGANIZER:
1. Organize a Folder by Extension
2. Preview Folder Contents
3. Back to Main Menu
```

```
=====
PERSONAL PRODUCTIVITY SUITE
=====

MAIN MENU:
1. Calculator Tool
2. Notes Manager
3. Timer & Stopwatch
4. File Organizer
5. Unit Converter
6. Backup & Restore
7. Exit

Enter your choice (1-7): 5

UNIT CONVERTER:
1. Length
2. Temperature
3. Weight
4. Back to Main Menu

Choice: 
```

```
=====
PERSONAL PRODUCTIVITY SUITE
=====

MAIN MENU:
1. Calculator Tool
2. Notes Manager
3. Timer & Stopwatch
4. File Organizer
5. Unit Converter
6. Backup & Restore
7. Exit

Enter your choice (1-7): 6

BACKUP & RESTORE:
1. Create Backup
2. List Backups
3. Restore Backup
4. Back to Main Menu

Choice: 2
backup_20251212_134249.zip

BACKUP & RESTORE:
1. Create Backup
2. List Backups
3. Restore Backup
4. Back to Main Menu

Choice: 1
```

```
BACKUP & RESTORE:
1. Create Backup
2. List Backups
3. Restore Backup
4. Back to Main Menu

Choice: 4

=====
PERSONAL PRODUCTIVITY SUITE
=====

MAIN MENU:
1. Calculator Tool
2. Notes Manager
3. Timer & Stopwatch
4. File Organizer
5. Unit Converter
6. Backup & Restore
7. Exit

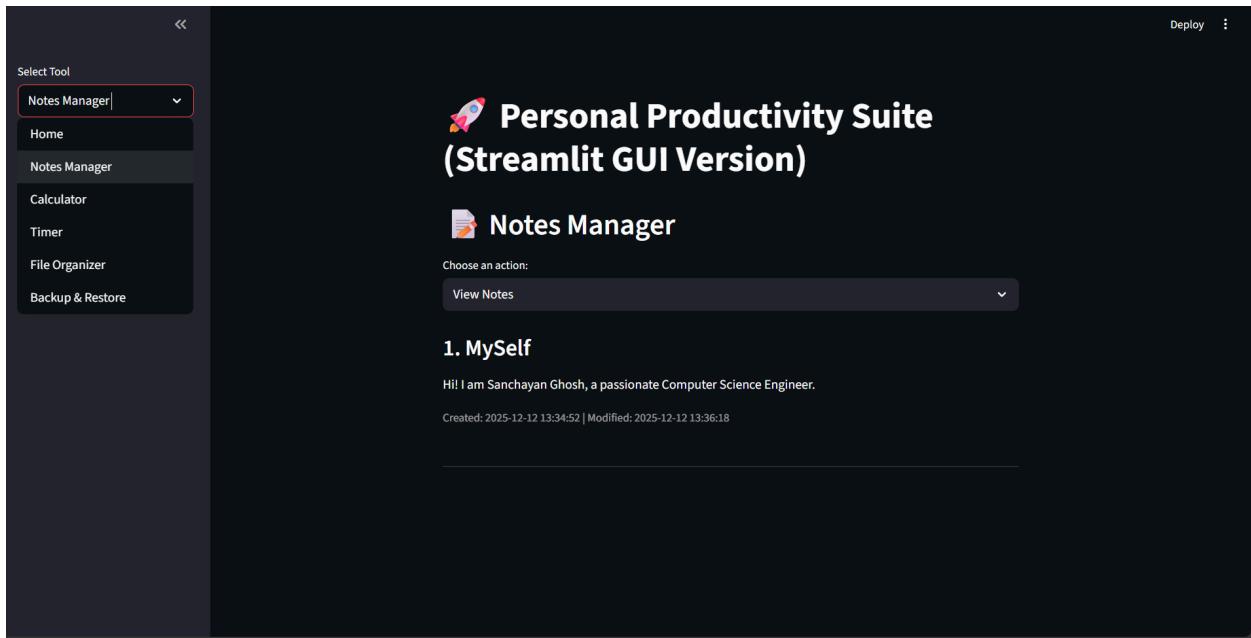
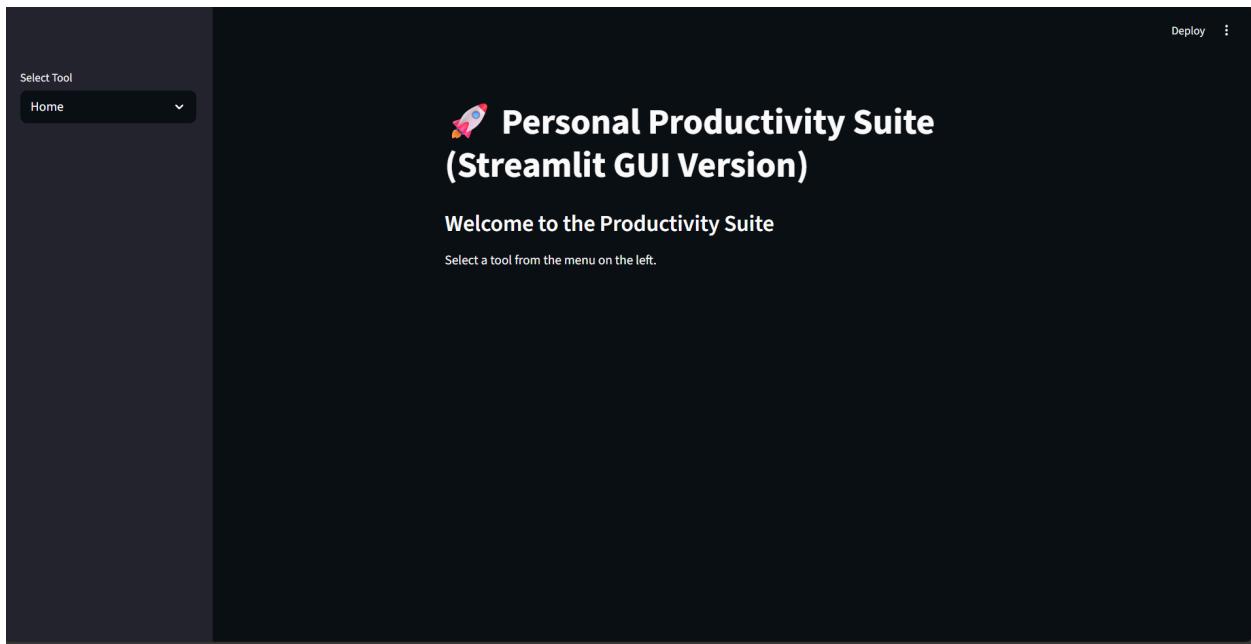
Enter your choice (1-7): 7
Goodbye! Have a productive day!
PS D:\productivity-suite>
```

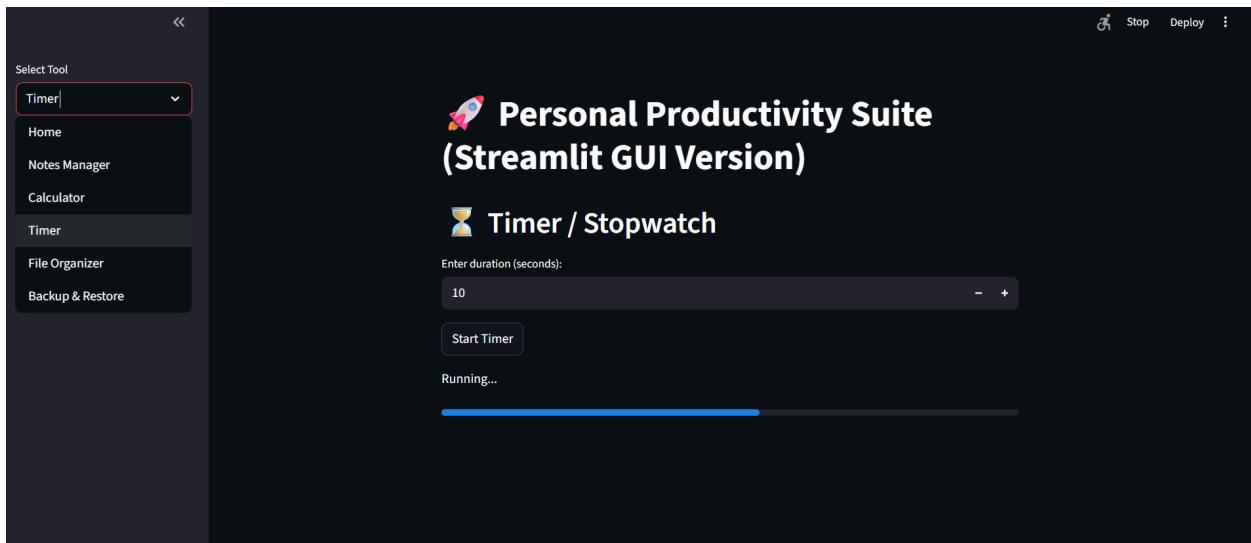
GUI interfaces

```
❖ PS D:\productivity-suite> streamlit run gui.py

You can now view your Streamlit app in your browser.

Local URL: http://localhost:8501
Network URL: http://192.168.10.5:8501
```





Conclusion

This project is a complete, professional-level Python tool demonstrating:

- Modular code
- Object-oriented design
- File handling (JSON, TXT, ZIP)
- GUI development
- Streamlit dashboard
- Unit testing
- Error handling best practices