

# Drone Telemetry Dashboard – Short Explanation

## What I Built

I created a simple drone telemetry dashboard using Python and Tkinter. The program simulates basic drone flight data such as speed, altitude, battery level, and GPS location. The interface looks like a small control panel where all values update in real time.

The dashboard runs for 30 seconds and updates all values every 1 second as required.

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## How It Works

The program uses a loop that runs every second using Tkinter's `after()` function.

In each second:

- The speed increases at the beginning (acceleration), then stays around a cruise value (around 60 km/h), and finally slows down.
- The speedometer needle moves smoothly instead of jumping.
- The altitude changes slightly to simulate flight movement.
- The battery percentage decreases gradually over time.
- The GPS marker moves based on direction and speed.
- The latitude and longitude values update according to the movement.

After 30 seconds, the simulation stops automatically.

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## Design and Structure

I divided the program into small sections:

- A speedometer section (center panel)
- A GPS map section with North, South, East, and West indicators
- An altitude meter and battery bar on the left panel
- An update function that controls all value changes

Each part updates inside the same timed loop to keep everything synchronized.

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## Tools Used

- Python 3
- Tkinter (for GUI)
- Math module (for rotation and movement calculations)

- Random module (to simulate realistic changes)

No external libraries were used.

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## **Summary**

This project demonstrates GUI development, real-time data simulation, basic animation logic, and structured program design using core Python.