Step-by-Step Beginner Guide: Deploying a Zero-Cost ML API on Render

Prerequisites: - GitHub account - Render account (free) - Python 3.8+ locally, pip, and optional Docker Day 1: Local setup 1. Clone the repo. Run `python -m pip install -r requirements.txt`. 2. Run `python train.py` to create model.joblib. 3. Run `uvicorn app:app --reload --host 0.0.0.0 --port 8000` and test locally using curl or Postman. Day 2: Push to GitHub & Deploy on Render 1. Create a GitHub repo and push all files. 2. On Render, create a new Web Service and connect to the GitHub repo. 3. Set Build Command: `pip install -r requirements.txt` 4. Set Start Command: `uvicorn app:app --host 0.0.0.0 --port 10000` 5. Select Free instance. Deploy and wait for the live URL. Day 3: Validate, Test & Report 1. Use curl to run multiple concurrent requests and observe Render logs. 2. Capture screenshots of the Render dashboard and logs showing cold-starts or request spikes. 3. Prepare submission: one-page proposal, architecture PNG, and final report docx.