**Lead Deduplication & Email Validation Tool**

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**Submission for:** Caprae Capital – AI Readiness Challenge  
**Project Duration:** ~5 hours

**Approach**

The goal was to improve lead generation data quality by building a lightweight, easy-to-use tool that cleanses uploaded contact data by:

* Removing duplicates
* Validating email formats
* Presenting results in a streamlined, user-friendly UI

I opted for a functionally focused approach (Quality First) to build a high-impactfeature within the time limit.

**Model Selection**

This version of the tool does not use a machine learning model but leverages:

* Regex pattern matching for email validation
* Rule-based filtering for deduplication  
  This choice was intentional to ensure speed, simplicity, and reliability within 5 hours.

**Data Preprocessing**

1. Input is a user-uploaded .csv file with leads.
2. Data is read using pandas, and rows with duplicate emails are dropped.
3. Each email is tested using a regular expression:

python

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r"^[\w\.-]+@[\w\.-]+\.\w{2,4}$"

This checks for proper structure: username@domain.extension.

**Performance Evaluation**

As this tool uses rule-based logic, performance is measured by:

* % of emails flagged as valid (manual spot-check for correctness)
* Clean UI/UX in previewing and downloading cleaned leads
* Successfully removing all duplicate entries by email

The tool correctly handled all edge cases in sample test data including:

* Invalid email endings (e.g., @invalid)
* Duplicate domains and names
* Empty fields

Instead of building a complex AI model, this tool delivers real-world impact by solving a core B2B sales pain point: bad lead data. It’s scalable, easy to integrate, and requires zero training — ideal for lean teams and startups.