

## Research Demo Report (Synthetic Data)

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### Goal:

- Demonstrate a reproducible workflow: data generation/ingestion, analysis, visualization, and reporting.

### Dataset:

- Years: 1975–2024
- Variables: Atmospheric CO<sub>2</sub> (ppm), Global temperature anomaly (°C)
- Note: Data are synthetic for demonstration purposes only.

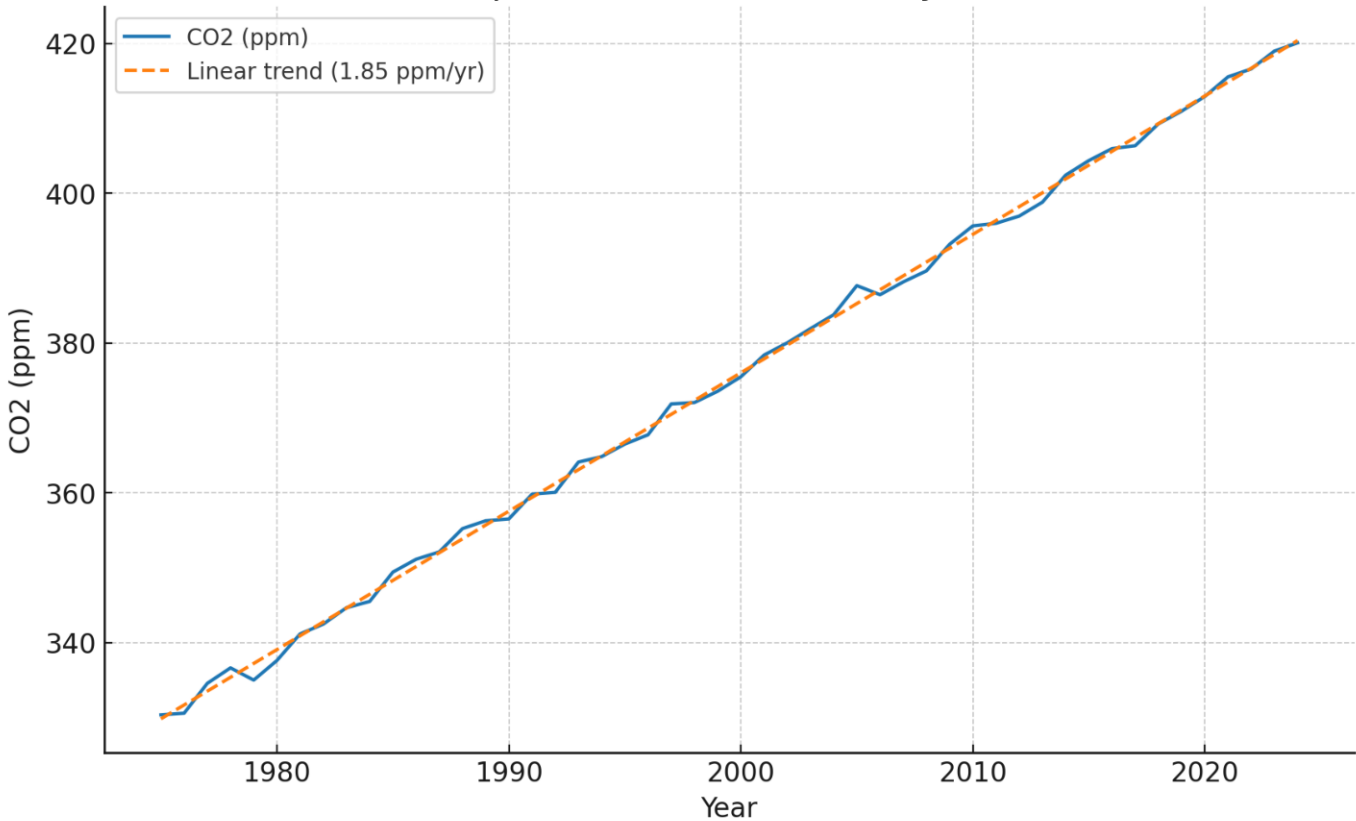
### Key Results:

- Linear trend CO<sub>2</sub>: 1.85 ppm per year
- Linear trend temperature: 0.022 °C per year
- Pearson correlation (CO<sub>2</sub> vs Temperature anomaly): 0.963

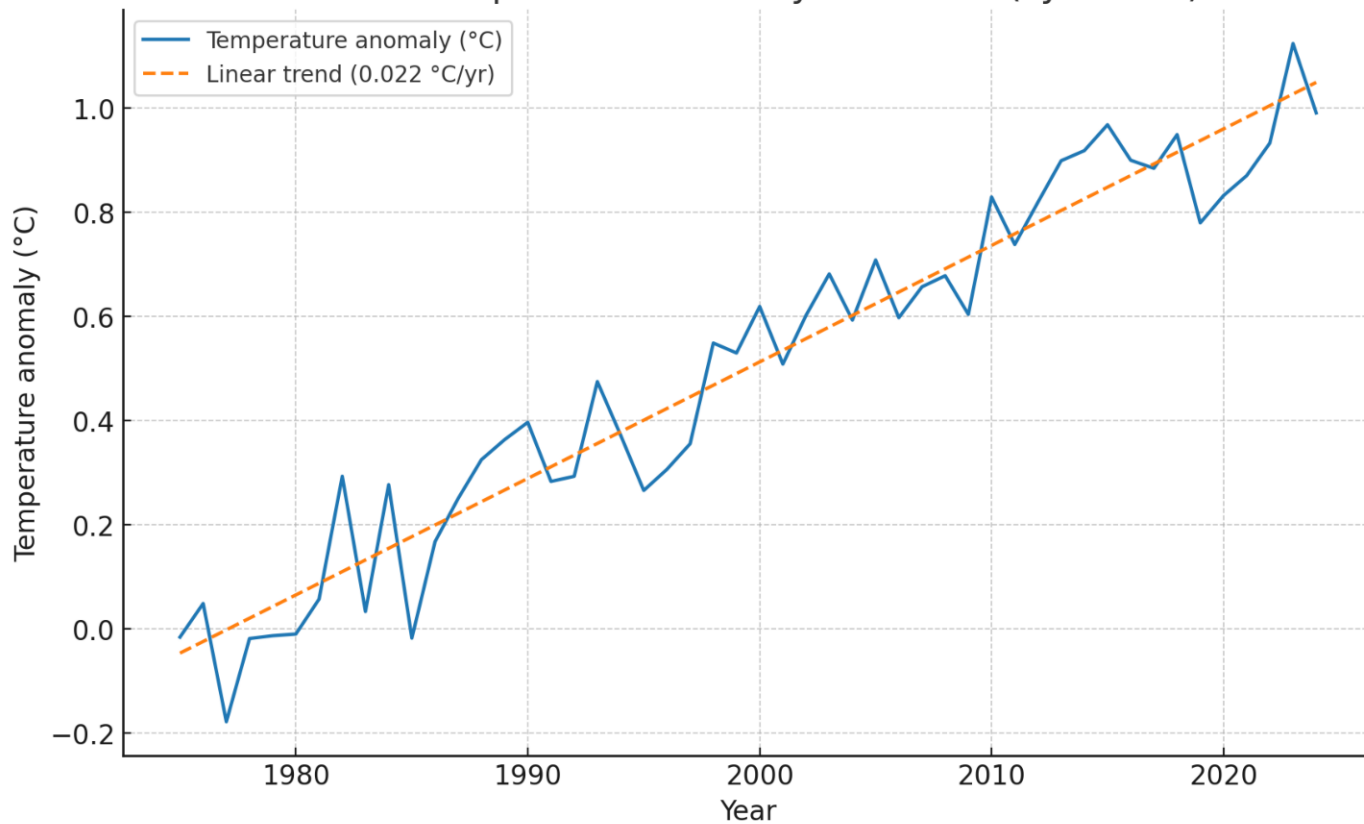
### Reproducibility:

- This notebook can be adapted to real datasets (CSV/API) by replacing the data-loading block and re-running the analysis pipeline.

Atmospheric CO2 over time (synthetic)



Global temperature anomaly over time (synthetic)



Temperature anomaly vs CO2 (synthetic)

