Friedrich-Alexander-Universität
Technische Fakultät

FAU

Relationship between Specific Pollution Types and Population

METHODS OF ADVANCED DATA ENGINEERING

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Agenda

1. Introduction
2. Data Overview
3. Analysis
4. Analysis - Sector-Specific Pollution
5. Population Analysis
6. Conclusion

Introduction

Introduction

Motivation

- Increasing concern over climate change.
- Understanding the relationship between CO2 emissions, population, and their environmental impact.

Goal

- Analyse and visualize top countries by emissions.
- Explore top countries by population.
- Identify the overlap between top emission and population countries.
- Understand the environmental implications.

Data Overview

Data Overview

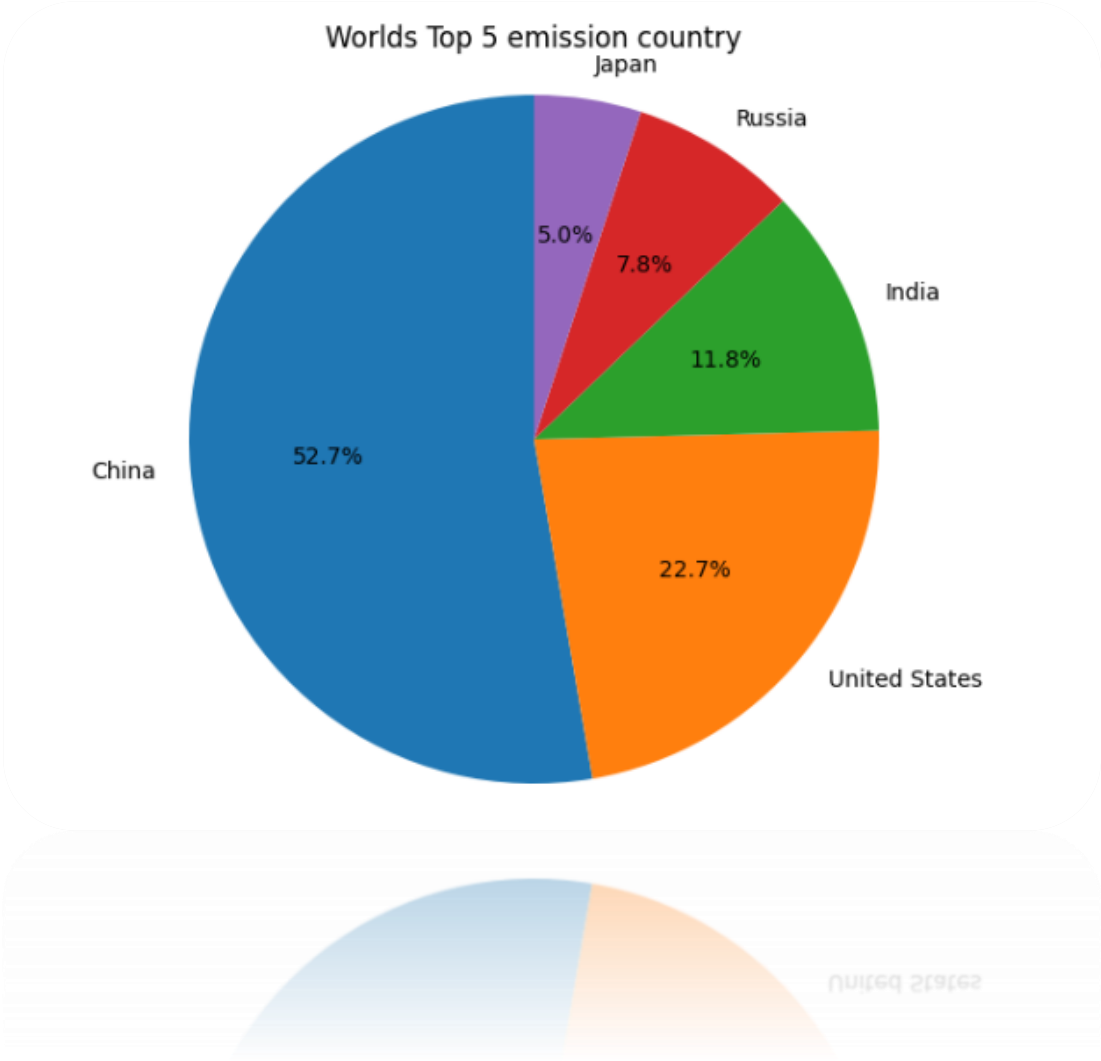
- **Data Sources**
  - Population Data
    - Kaggle - World Population Dataset
    - Data Type: CSV
  - Country-wise Emission Data
    - Kaggle - Global Fossil CO2 Emissions by Country
    - Data Type: CSV
- **Overview**
  - Total Pollution, Coal, Oil, Gas, Cement, Flaring, Other Sources.
  - Explore relationship between population size and pollution levels.

Analysis

Analysis

- **Top 5 Emission Countries (2020)**
  - China (52.7%)
  - United States (22.7%)
  - India (11.8%)
  - Russia (7.8%)
  - Japan (5.0%)

- **Pollution Categories**
  - Coal,
  - Oil,
  - Gas,
  - Cement, and
  - Flaring, Total.



Analysis - Sector-Specific Pollution

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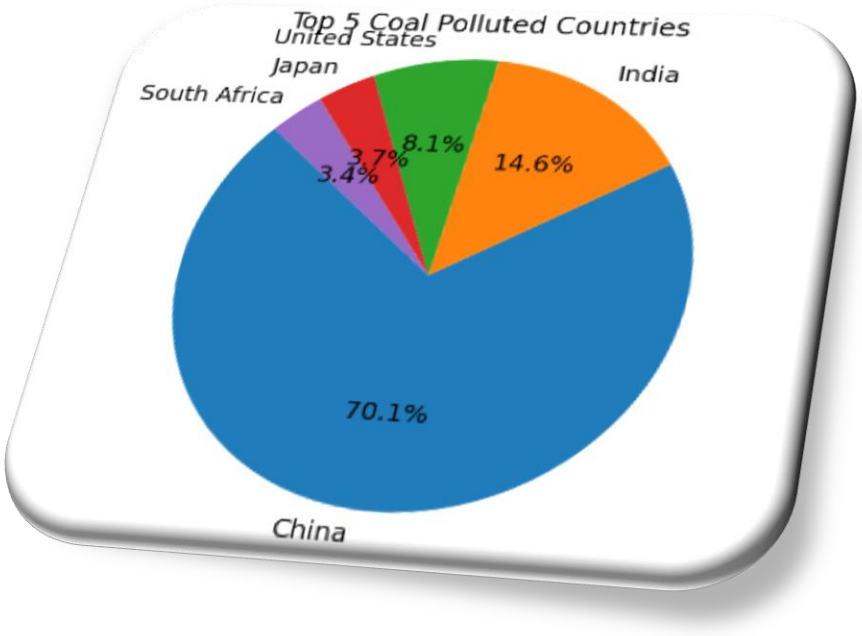
1. Coal Emissions:

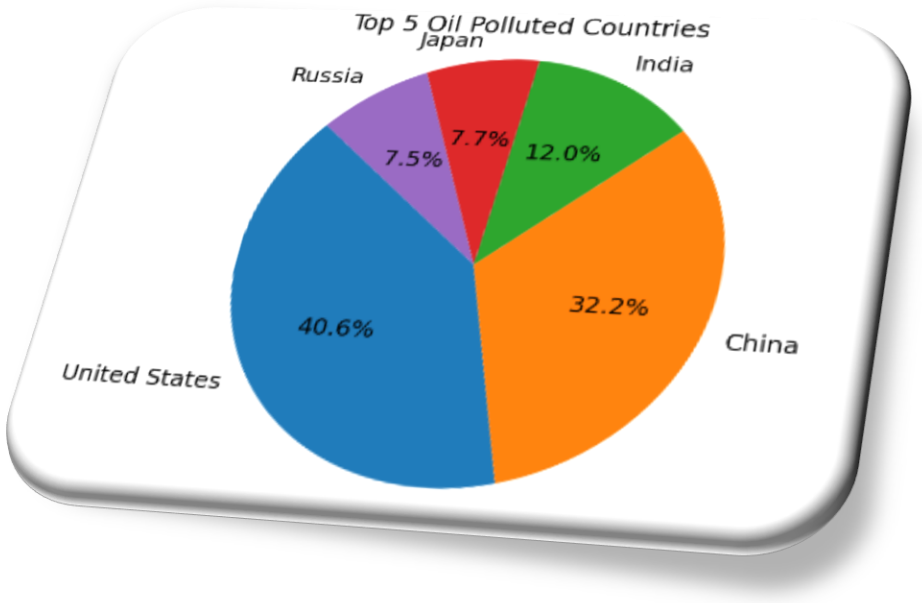
- China dominance due to heavy reliance on coal.
- Challenges in transitioning without compromising energy security.



Analysis - Sector-Specific Pollution

2. Oil Emissions:

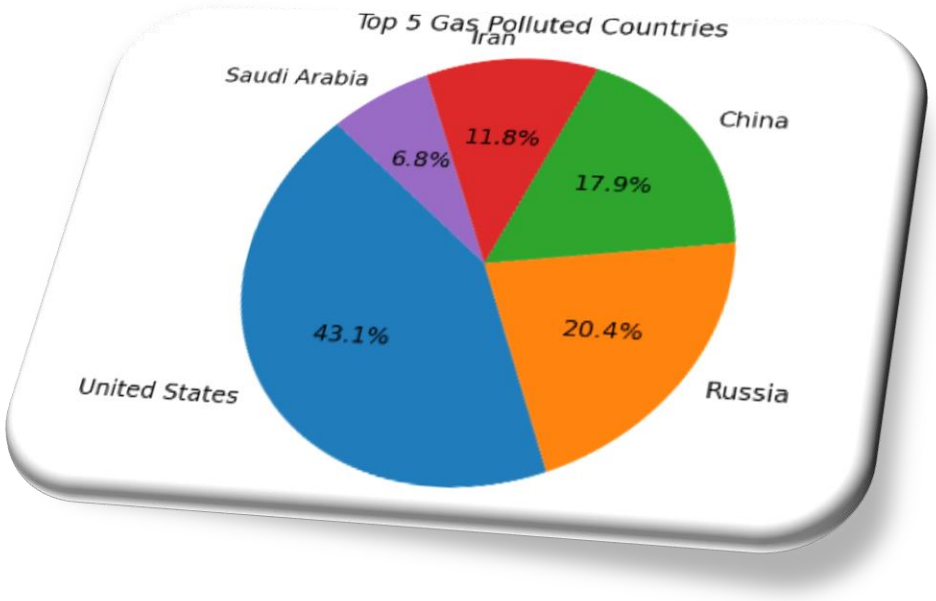
- U.S. influenced by vast transportation sector.
- Need for advancements in electric vehicles and renewable energy sources.



Analysis - Sector-Specific Pollution

3. Gas Emissions:

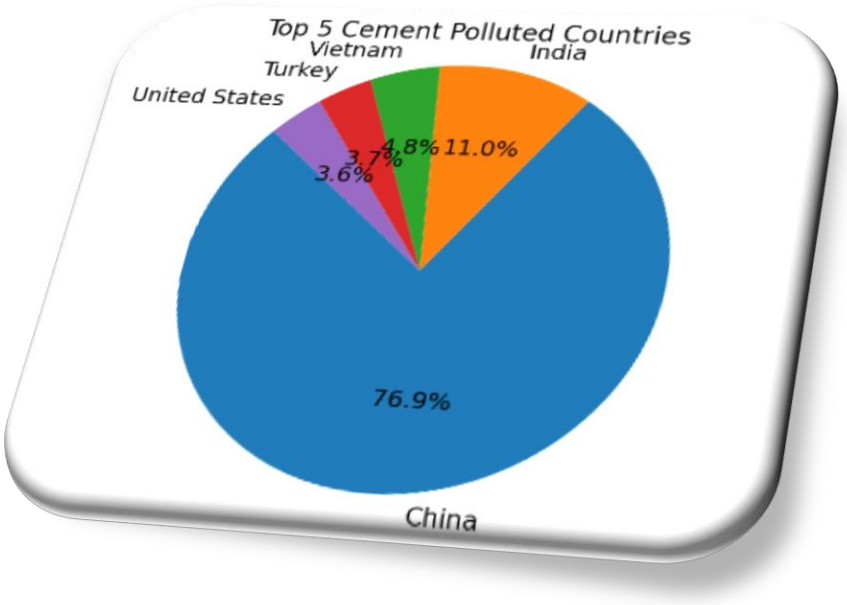
- U.S. relies on natural gas.
- Russia and China driven by energy demands.
- Emphasis on energy efficiency and renewable sources.



Analysis - Sector-Specific Pollution

4. Cement Emissions:

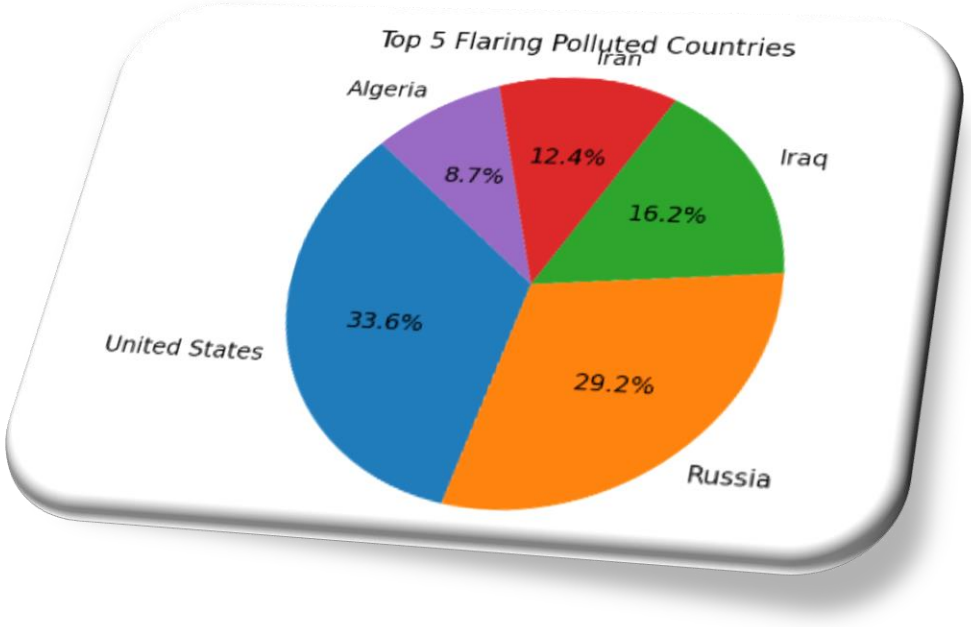
- China's dominance due to construction sector.
- Innovations in low-carbon cement needed.



Analysis - Sector-Specific Pollution

5. Flaring Emissions:

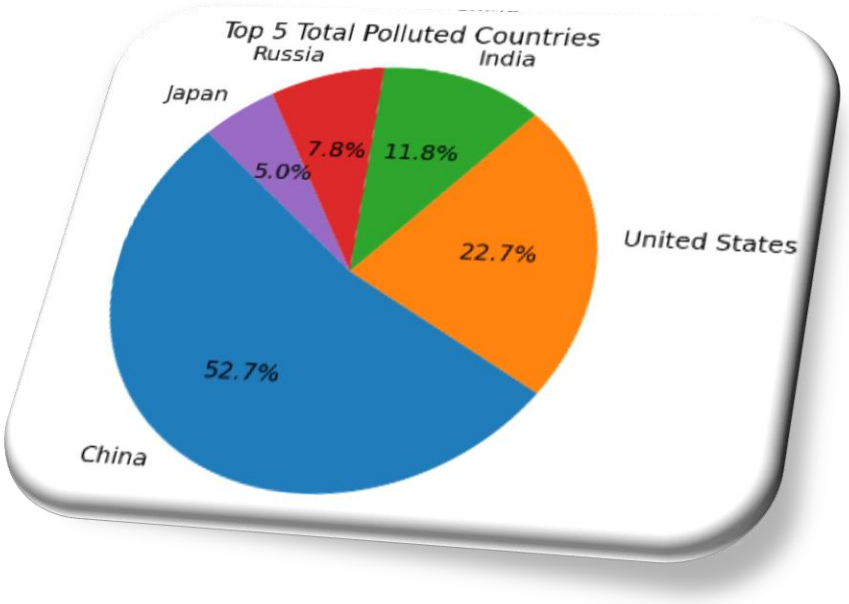
- U.S. and Russia lead due to oil and gas practices.
- Need for investments in infrastructure and regulations.



Analysis - Sector-Specific Pollution

6. Total Emissions:

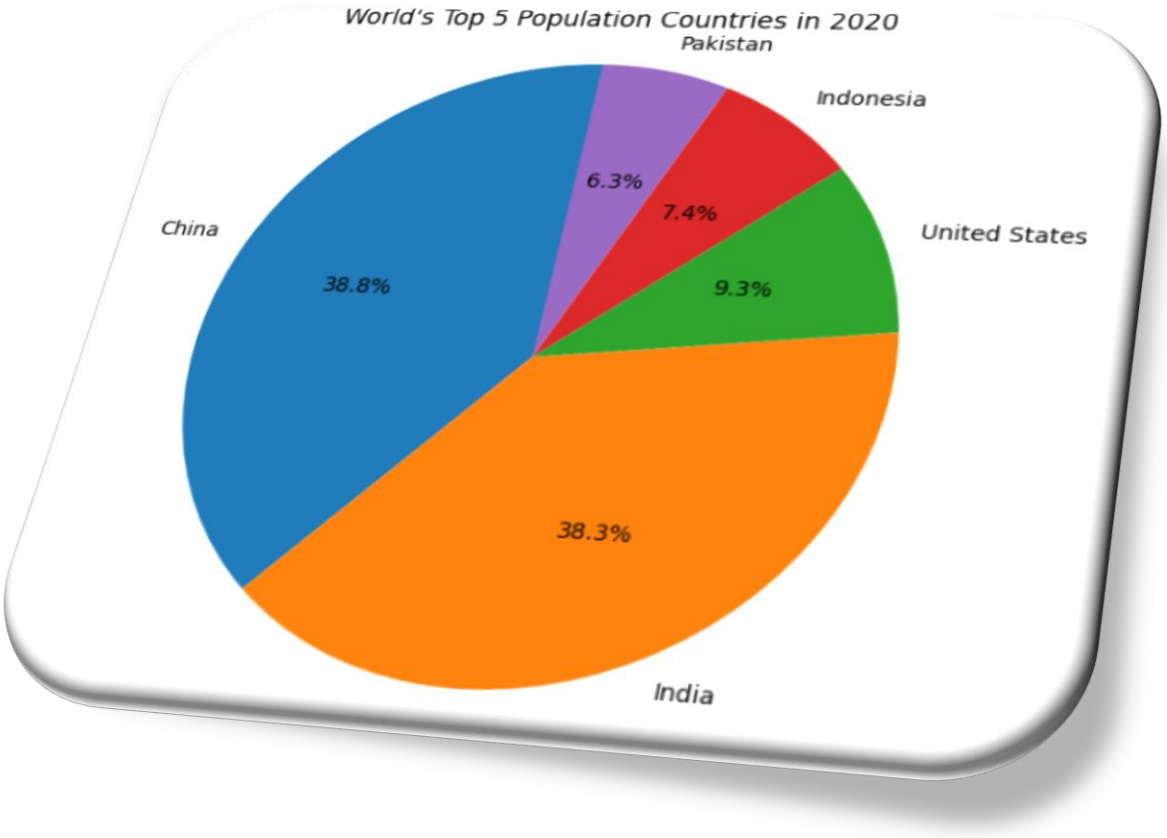
- China's lead underscores major energy consumption.
- Multifaceted approach needed involving policy, technology, and collaboration.



Population Analysis

Analysis - Sector-Specific Pollution

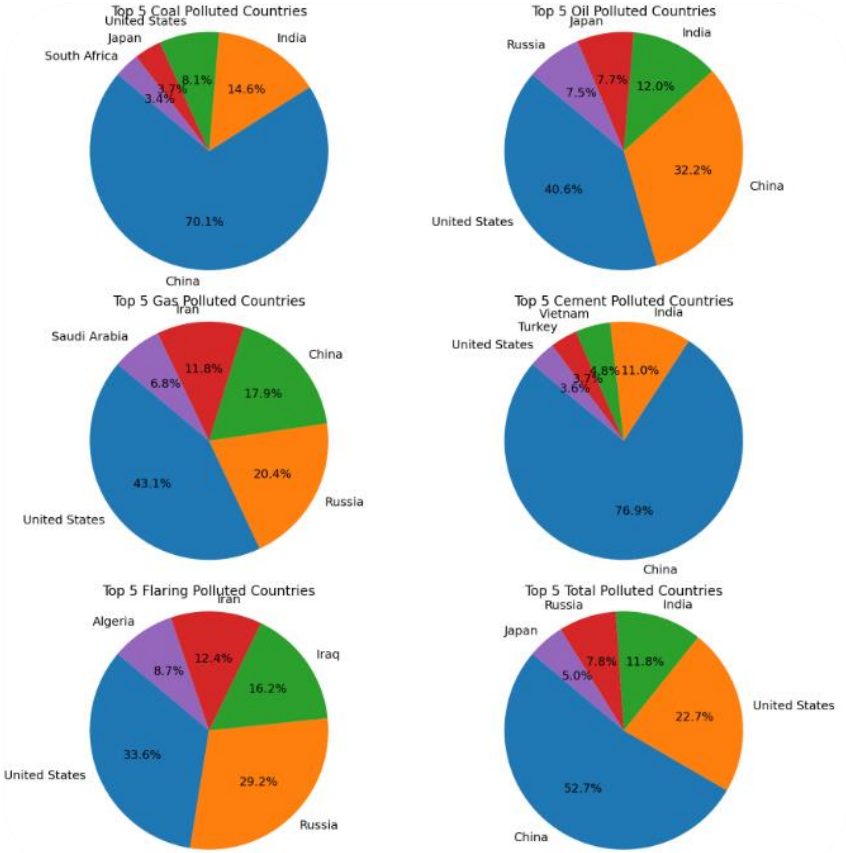
- **Top 5 Population Countries (2020)**
  - China,
  - India,
  - United States,
  - Indonesia,
  - Pakistan.



Analysis - Sector-Specific Pollution

➢ Analysis of Polluted Countries vs. Population

1. **Coal Pollution:**
   - China (70.1%), India (14.6%).
2. **Oil Pollution:**
   - United States (40.6%), China, India.
3. **Gas Pollution:**
   - United States (43.1%), Russia, China.
4. **Cement Pollution:**
   - China (76.9%), India, Vietnam.
5. **Flaring Pollution:**
   - United States, Russia, Iraq, Iran, Algeria.
6. **Total Pollution:**
   - China, India, United States, Russia, Japan.



Conclusion

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Key Points

- Intricate relationship between population, industrial growth, and environmental pollution.
- Larger populations and robust industrial sectors dominate pollution landscape.
- Consider per capita pollution metrics and broader context.
- Global effort needed for sustainable development and environmentally conscious policies.

Thank You
For your attention!