donmumina / **phase_1_project**

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Phase_1_project

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Public repository · Forked from learn-co-curriculum/dsc-phase-1-project-v3

1 Branch | 0 Tags | Go to file t | Go to file | Add file | Code

This branch is 7 commits ahead of `learn-co-curriculum/dsc-phase-1-project-v3:master` .

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donmumina Aircraft Risk Analysis Recommendations — cda1e35 · 9 minutes ago

data	Aircraft Risk Analysis Recommendati...	19 minutes ago
.gitignore	add .gitignore and init repo	2 years ago
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README | License

**README: Aircraft Risk Analysis Project

**Project Overview

This project analyzes aviation incident data to identify the safest aircraft models for a company entering the aviation business. The analysis focuses on risk metrics across operational factors to support data-driven investment decisions.

**Project Details • Student Name: Michael Mumina Kasimu • Pace: Part Time • Project Review Date: 27/07/2025 23:59:59 • Instructor: Fidelis Wanalwenge • Blog Post URL: [To be added]

***Project Structure text project/

├***data/*** │ ├Aviation_Data.csv # Raw dataset │ ├***cleaned_data.xlsx # Cleaned dataset*** │ └cleaned_data_Metrics.xlsx # Calculated risk metrics ├*** analysis.ipynb # Jupyter notebook with full analysis └*** README.md # This file

***Key Analysis Steps

1. **Data Preparation

   • Loaded and cleaned aviation incident data • Handled missing values in critical fields (Make, Model, Injuries, Damage) • Filtered relevant columns for analysis

2. ***Risk Metrics Calculation

Developed three core safety metrics:

****Fatality Risk: Fatalities per incident ****Damage Risk: Probability of severe damage ****Overall Risk: Weighted composite score (0-100 scale)

3. **Operational Analysis

Examined three key operational factors: ****Engine Type: Distribution among safest aircraft ****Phase of Flight: When incidents occur ****Purpose of Flight: Primary use cases

4. **Visualization

Created multiple visualizations including:

```
- Safety score comparisons
- Operational factor distributions
- Interactive treemaps of phase/make risk
- Fatality rate scatter plots
```

**Key Findings

```
1. Safest Aircraft: Boeing 787 ranked safest based on metrics
2. Engine Types: Turbofan/jet engines dominate safest models
3. High-Risk Phases: Takeoff, maneuvering and landing account for 72% of incidents
4. Avoid: Piston engines and amateur-built aircraft showed higher risks
```

**Recommendations

```
1. Prioritize: Turbofan/jet aircraft (Cessna 208, Pilatus PC-12)
2. Training Focus: Takeoff/landing procedures
```

```
3. Avoid: Models with Overall Risk score > 65
4. Consider: FAR Part 135 certified aircraft for stricter standards
```

**How to Use

```
1. Run analysis.ipynb to reproduce analysis
2. Review cleaned_data_Metrics.xlsx for complete risk scores
3. See visualizations for operational insights
```

**Technology Dependencies • Python 3.8+ • Pandas, Matplotlib, Seaborn, Plotly • Jupyter Notebook

**Contact

For questions, contact Michael Mumina Kasimu at donmumina@gmail.com

Releases

No releases published
Create a new release

Packages

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Languages

- **Jupyter Notebook** 100.0%