**TITANIC EDA & RESEARCH IDEA PROPOSAL**

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🔎 **Comparative Study of Findings**

**Key Patterns or Trends Discovered**

* Survival rates were higher for women and children compared to men.
* Passengers in higher classes (1st class) had a significantly better chance of survival than those in lower classes.
* Younger passengers had higher survival rates compared to older ones.
* Fare and class were positively correlated with survival chances.

**Insights Gained from the Dataset**

* Gender, age, and socio-economic status played a crucial role in survival during the Titanic disaster.
* Women and children-first evacuation policy was visible in the survival data.
* Wealthier passengers had an advantage, revealing inequalities in safety measures.
* Data highlights the importance of structured evacuation policies in disaster management.

**Rationale Behind the Proposed Idea**

* The Titanic dataset shows clear bias in survival outcomes based on demographics and class.
* This insight can inspire research into developing **fair, efficient, and data-driven evacuation systems**.
* A predictive system could ensure both safety (prioritizing vulnerable groups) and fairness (not just wealth-based priority).

**Proposed Research / Innovation Idea**

**Problem / Opportunity**  
\* From the Titanic dataset analysis, we observed that gender, class, and age strongly influenced survival chances.  
In real-world transport systems (ships, airplanes, trains), emergency evacuation is often chaotic, and prioritization is not always fair or efficient.

This suggests an opportunity:  
 Can we use data-driven models to design safer and more efficient evacuation strategies?

**Proposed Idea**  
Develop a *Passenger Safety Prediction & Evacuation Support System*.

* Train a machine learning model on demographic + travel data (age, gender, class, ticket type, etc.) to predict survival likelihood during emergencies.
* Use these predictions to recommend optimized evacuation plans that balance both safety (children, elderly) and fairness (not just wealth/class).

**How an R&D Team Could Develop It**

* **Data Collection** – Gather data from multiple transport systems (ship manifests, airline data, past incident reports).
* **Model Training** – Use classification models (Logistic Regression, Decision Trees, Random Forest) to predict survival probability.
* **Simulation Tool** – Build software that simulates evacuation scenarios using real layouts of ships/airplanes.
* **Integration** – Connect the model with real-time passenger data systems (boarding lists, seat maps).
* **Ethical Design** – Ensure prioritization balances both safety (children, elderly) and fairness (not just rich/first-class).

**Validation / Testing**

* Run simulations on Titanic-like scenarios and compare predicted survival outcomes with historical records.
* Test the system on synthetic evacuation drills with volunteer participants.
* Compare results against traditional “women and children first” evacuation rules to check improvements in survival distribution.

**Titanic Dataset EDA (Exploratory Data Analysis)**

A graph with blue squares

AI-generated content may be incorrect.A graph of survival rate by class

AI-generated content may be incorrect.A graph of age distribution

AI-generated content may be incorrect.A graph with blue squares

AI-generated content may be incorrect.A diagram of a bar graph

AI-generated content may be incorrect.A screenshot of a graph

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