**Laboratory 4**

Variant 4 – Survival prediction model in Titanic Crash

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Lab group 105

*Group 9 – Aditya Kandula, Martyna Wielgopolan*

1. Introduction

The goal is to build models that can predict whether a given passenger survived the Titanic shipwreck, based on various features such as age, sex, ticket class, fare paid etc...This task uses real data collected from passengers aboard the RMS Titanic:

* **Demographics**: Age, sex, and passenger class (Pclass)
* **Travel Details**: Fare, number of siblings/spouses or parents/children aboard, embarkation port
* **Survival status**: The target variable (0 = did not survive, 1 = survived)

The objective is to explore and clean the dataset, engineer relevant features, and apply machine learning models to accurately predict survival. Two models — **Logistic Regression** and **Random Forest** — are trained, validated using cross-validation, and compared based on performance metrics like accuracy, precision, recall, and F1-score.

By analysing model behaviour and the importance of individual features (e.g. gender), this task provides both practical insights into model interpretability and technical training in machine learning pipeline from data preprocessing to model evaluation.

1. Implementation
2. Discussion
3. Conclusions