**Titanic Survival Analysis Report**

**1. Introduction**

The Titanic dataset provides information on passengers aboard the Titanic, including their survival status, class, age, gender, and embarkation port. This analysis aims to uncover key factors affecting survival rates and present findings in a structured manner.

**2. Data Cleaning & Preprocessing**

* Missing values in the dataset were handled appropriately.
* Age groups were categorized as **Below 25** and **25+** for comparative analysis.
* Categorical variables such as embarkation ports (C, Q, S) were encoded for analysis.
* Passenger Class (Pclass) was used as a primary factor in survival rate assessment.

**3. Key Findings**

**3.1 Survival Rate by Passenger Class**

| **Class** | **Survival Rate** |
| --- | --- |
| 1st Class | **63%** |
| 2nd Class | **47%** |
| 3rd Class | **24%** |

* **Insight:** Higher-class passengers had a significantly higher chance of survival.
* **Reason:** 1st-class passengers had better access to lifeboats.

**3.2 Survival Rate by Gender**

| **Gender** | **Survival Rate** |
| --- | --- |
| Female | **74%** |
| Male | **18%** |

* **Insight:** Females had a much higher survival rate.
* **Reason:** "Women and children first" protocol was followed during evacuation.

**3.3 Survival Rate by Embarkation Port**

| **Port** | **Survival Rate** |
| --- | --- |
| C (Cherbourg) | **50.6%** |
| Q (Queenstown) | **2.6%** |
| S (Southampton) | **19.72%** |

* **Insight:** Passengers from **Cherbourg (C)** had the highest survival rate.
* **Reason:** More **1st-class passengers** boarded from Cherbourg.

**3.4 Age-Based Survival Rate**

| **Age Group** | **Survival Rate** |
| --- | --- |
| Below 25 | **55%** |
| 25+ | **30%** |

* **Insight:** Younger passengers had a higher survival rate than older ones.
* **Reason:** Younger passengers may have been given priority in lifeboats.

**4. Visualizations**

* **Pivot Tables & Charts** were created to represent survival distributions.
* **Bar charts & pie charts** were used for easy interpretation of class, gender, and age-based survival.

**5. Conclusion & Recommendations**

**Who Was Most Likely to Survive?**

✅ **1st Class passengers** had the highest survival rate. ✅ **Females** had a significantly higher survival rate than males. ✅ **Passengers under 25** had better survival chances than older passengers. ✅ **Passengers who embarked from Cherbourg (C)** had a better chance of survival.

**Who Had the Lowest Survival Rate?**

❌ **3rd Class males** had the lowest survival rate. ❌ **Older passengers (25+)** were less likely to survive. ❌ **Passengers from Queenstown (Q) had the lowest survival rate.**

**Recommendations**

* Future safety measures on ships should ensure **equitable lifeboat access** across all classes.
* Emergency response plans should consider **age and mobility factors** when prioritizing rescue.
* Historical learnings from Titanic can be applied to **modern maritime safety protocols**.

**6. Next Steps**

* Conduct further analysis on **family size impact on survival rates**.
* Explore **machine learning models** to predict survival likelihood.
* Visualize data with **interactive dashboards** using Power BI or Tableau.

**End of Report**