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POLITEKNIK BRUNEI

SCHOOL OF INFORMATION AND COMMUNICATION TECHNOLOGY

DA4310 – DATA SCIENCE

Assignment One: Dashboard Application

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Submitted by

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Contents

Introduction

The sinking of the RMS Titanic in 1912 remains one of the most tragic maritime disasters in history, prompting ongoing fascination and analysis (*Report With Individual Authors References*, n.d.). In this report, we delve into an exploration of the Titanic dataset, sourced from the Titanic beginners' competition on Kaggle (*Report by a Government Agency*, n.d.). The dataset is derived from the Titanic test file and the associated gender_submission, skillfully combined into a comprehensive CSV file. The purpose of this report is to leverage the dataset's insights, allowing for the creation of a dashboard application that aids in visualizing and understanding the factors influencing survival on the Titanic.

Problem Statements

Our analysis begins with a meticulous identification of the key problem statements inherent in the dataset. By scrutinizing the provided data, we aim to uncover patterns and factors that influenced the survival or demise of passengers aboard the Titanic (*Report by a Government Agency*, n.d.). This investigation is underpinned by clear and valid evidence extracted from the dataset, providing a robust foundation for our subsequent analyses.

Aims and Objectives

The overarching aim of our dashboard application is to enhance the understanding of the Titanic dataset, striving for accuracy levels exceeding 70% (*Report by a Government Agency*, n.d.). To achieve this, we outline three specific objectives: to identify influential variables affecting survival rates, to visualize these insights through comprehensible charts, and to empower users to make informed predictions with a potential accuracy of 100%.

Application Overview

This study envisions a dashboard application that is a useful tool for observing the details of the Titanic dataset. Using an easy-to-use interface, users may peruse the content and get important insights into the dynamics of survival and death during the tragic expedition. The purpose, organization, and goals of the application are outlined in this paper, which also provides the foundation for a detailed analysis of the dataset and its implications.

Main Dashboard

In this part, we'll take you on a visual tour of our Main Dashboard, going over each significant visualization in depth. We will give detailed descriptions of each dashboard component, accompanied by screenshots, to help you understand their value.

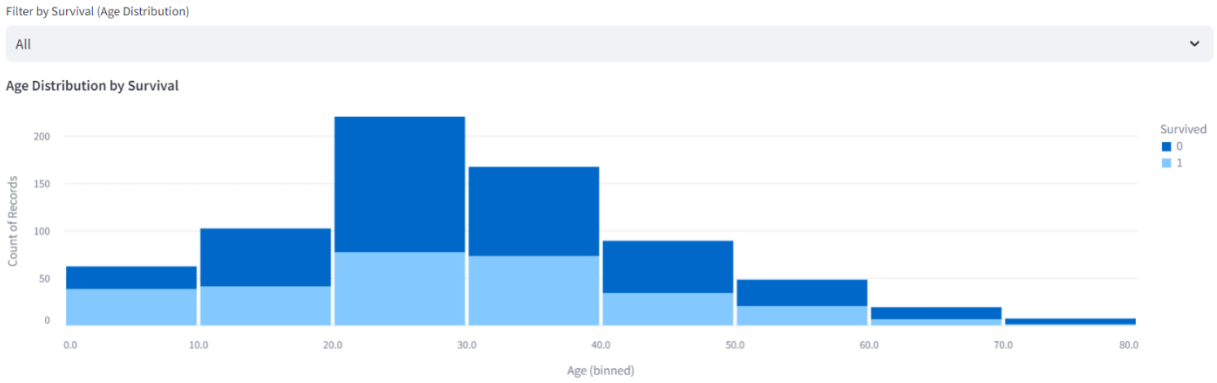


Figure 01 bar chart of age distribution by survivability

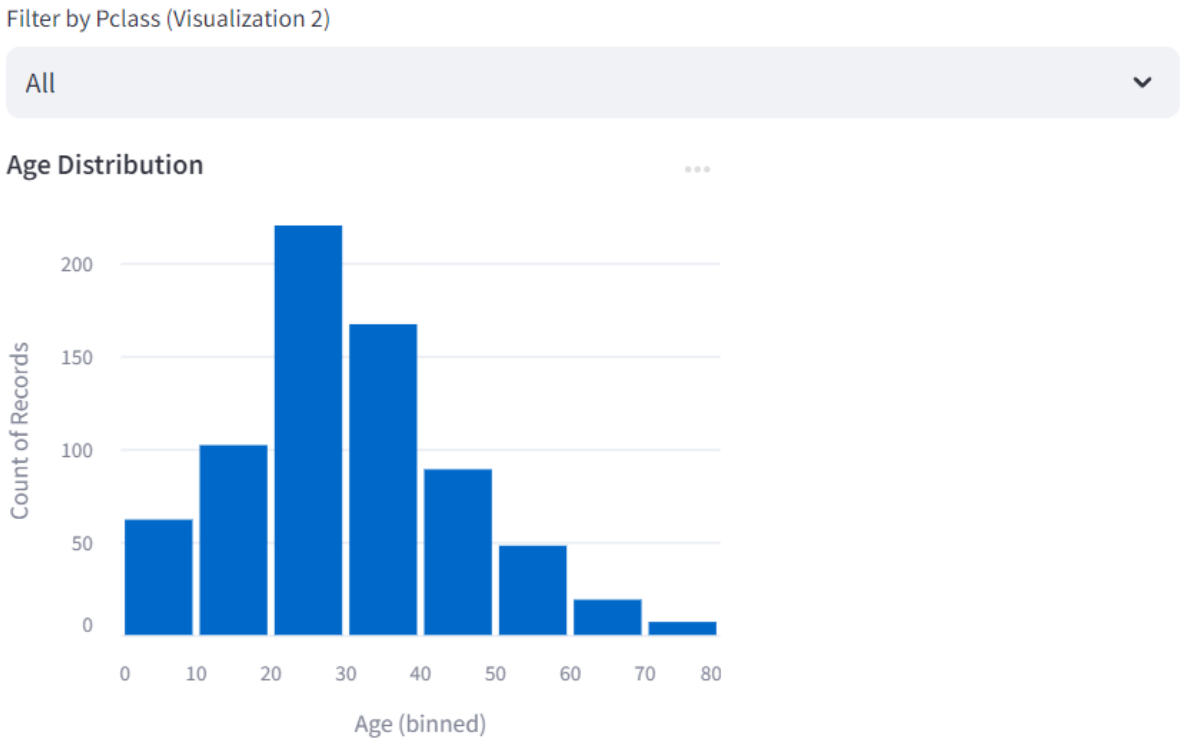


Figure 02 shows a bar chart for age distribution on ticket class

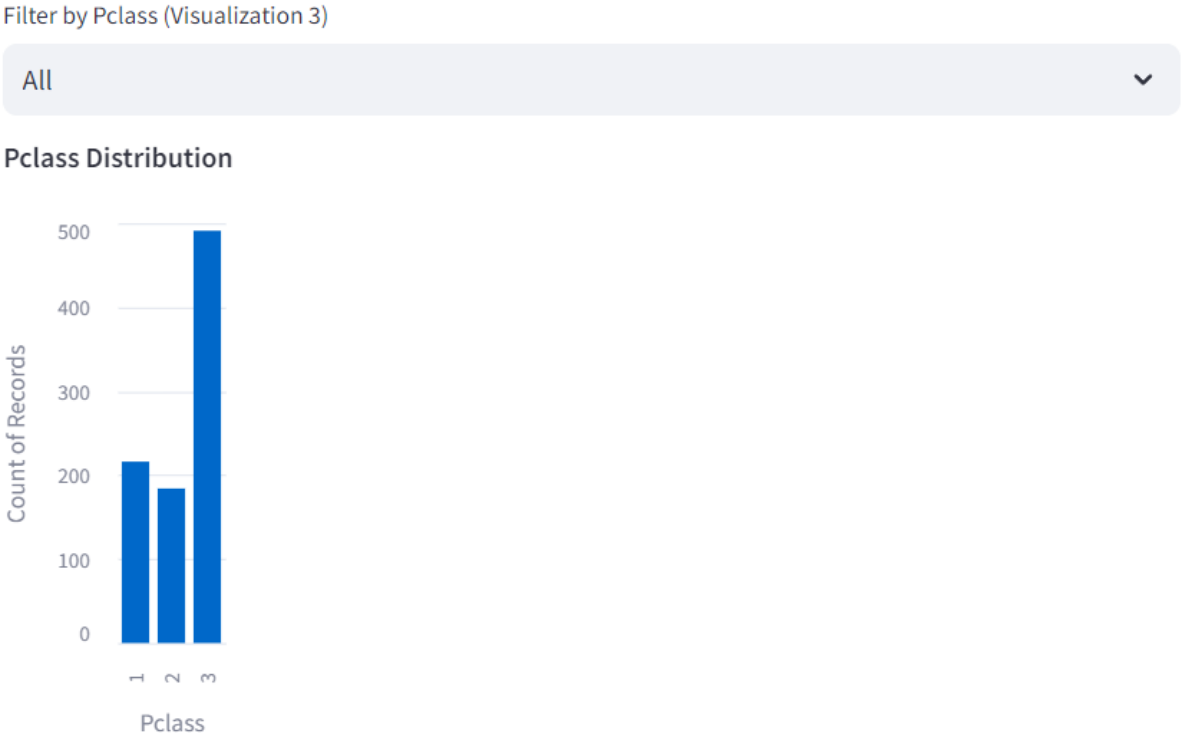


Figure 03 shows a bar chart for the survivability of different ticket classes

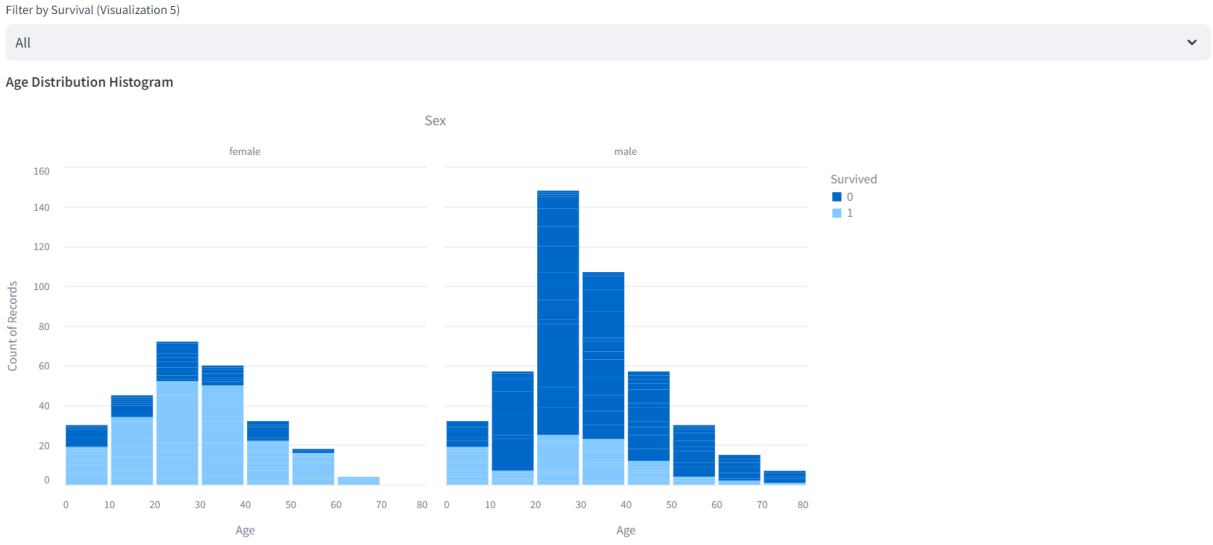


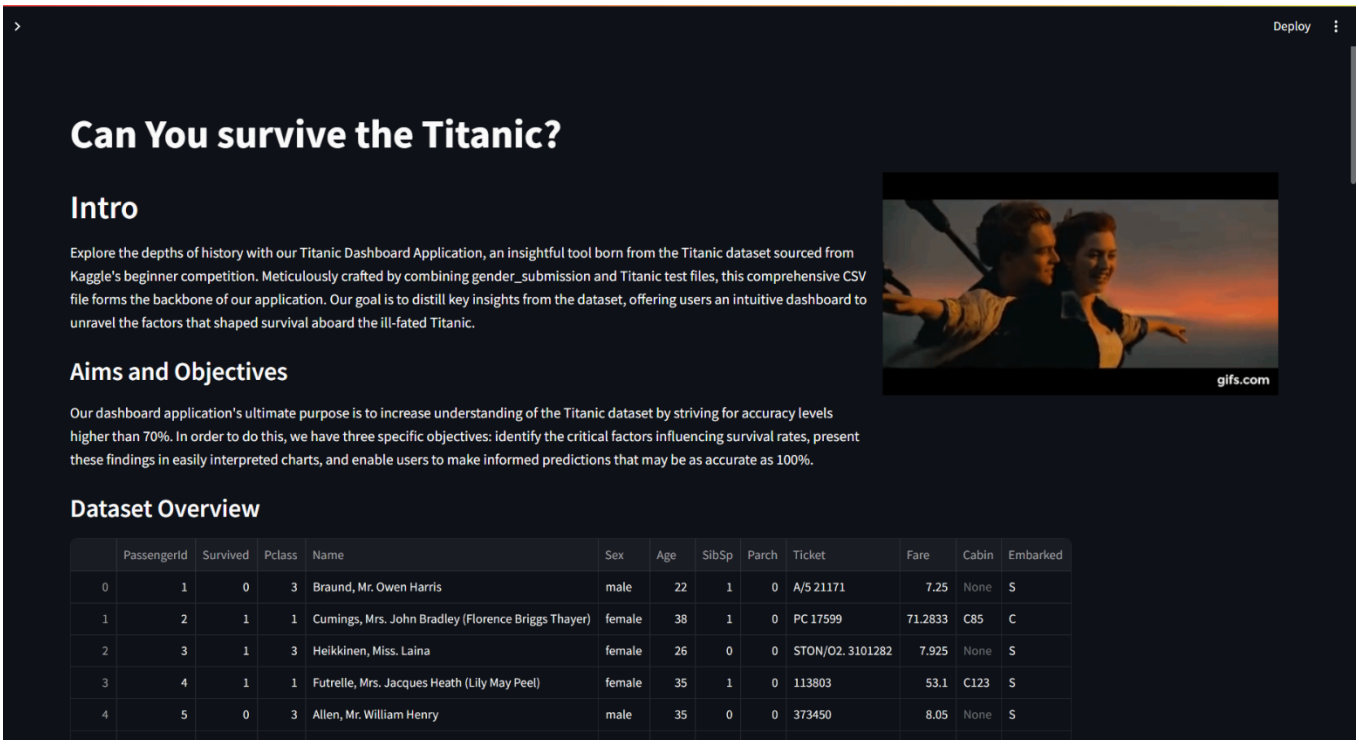
Figure 04 shows two histograms for different genders depending on their survivability

Figure 05 shows a histogram for Number of siblings by parches

Figure 06 a histogram for different embarkments survivability

User Manual

We offer a thorough user manual in this part to help you explore the features and functionalities of our program. This handbook is meant to help you at every stage, regardless of your level of expertise with the program—whether you're a novice looking to learn the basics or an expert user looking for advanced guidance.



	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare	Cabin	Embarked
0	1	0	3	Braund, Mr. Owen Harris	male	22	1	0	A/5 21171	7.25	None	S
1	2	1	1	Cumings, Mrs. John Bradley (Florence Briggs Thayer)	female	38	1	0	PC 17599	71.2833	C85	C
2	3	1	3	Heikkinen, Miss. Laina	female	26	0	0	STON/O2. 3101282	7.925	None	S
3	4	1	1	Futrelle, Mrs. Jacques Heath (Lily May Peel)	female	35	1	0	113803	53.1	C123	S
4	5	0	3	Allen, Mr. William Henry	male	35	0	0	373450	8.05	None	S

Figure 07

Main Dashboard Introduction; Upon opening the application, the main dashboard will be displayed, featuring an introduction and objectives. Below, you'll find an overview of the Titanic dataset.

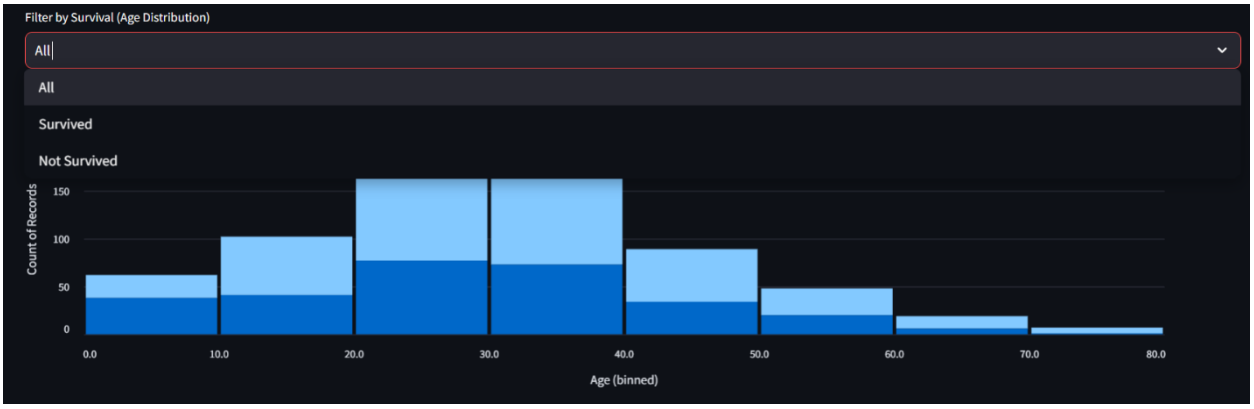


Figure 08

Histogram Chart Visualization (Figure 08); Scroll down to encounter the first visualization, a histogram chart. Clicking on "Filter by Survival (Age Distribution)" reveals a dropdown option to filter ages based on survival status.

Figure 09

Second Histogram Visualization (Figure 9 to 13); Continue scrolling to explore subsequent visualizations, similar in structure to the first one. Figure 9 to 13 covers visualizations 2 to 6.

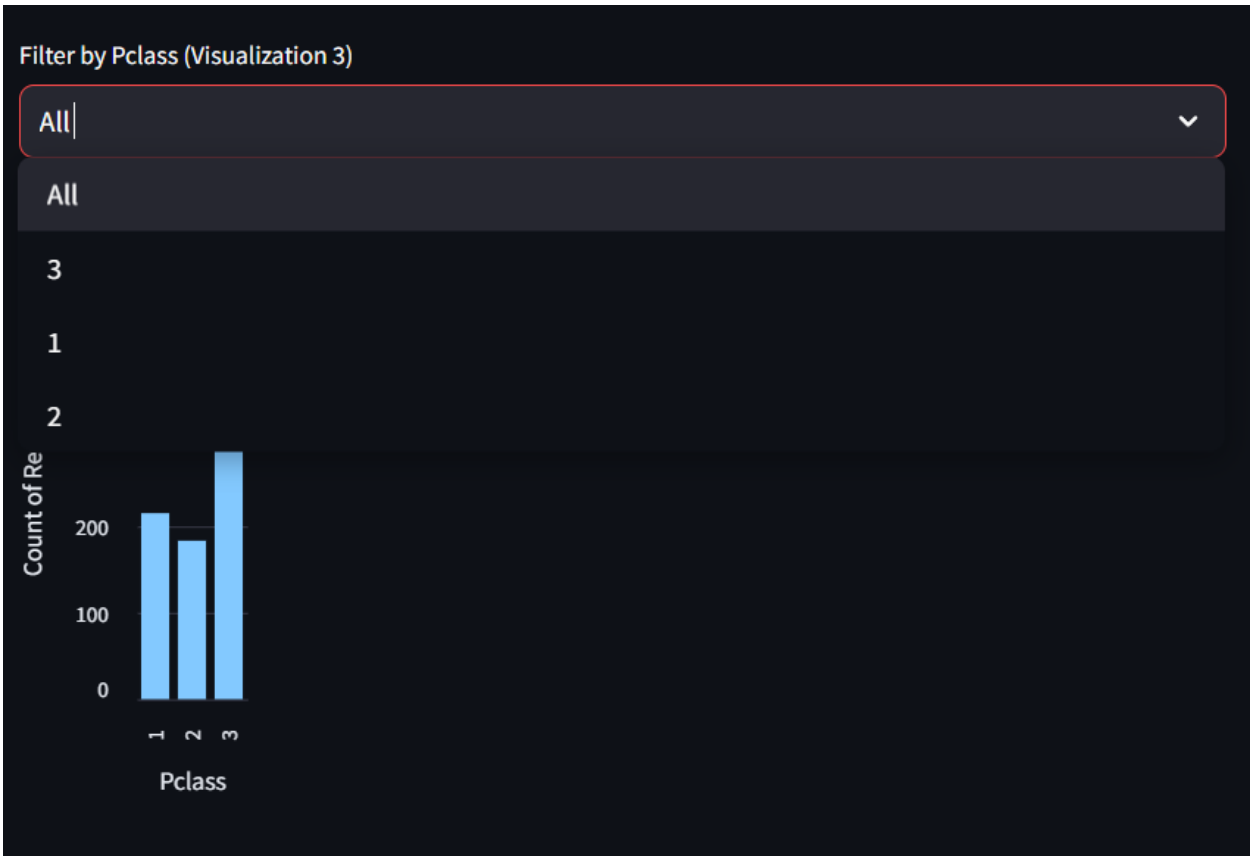


Figure 10

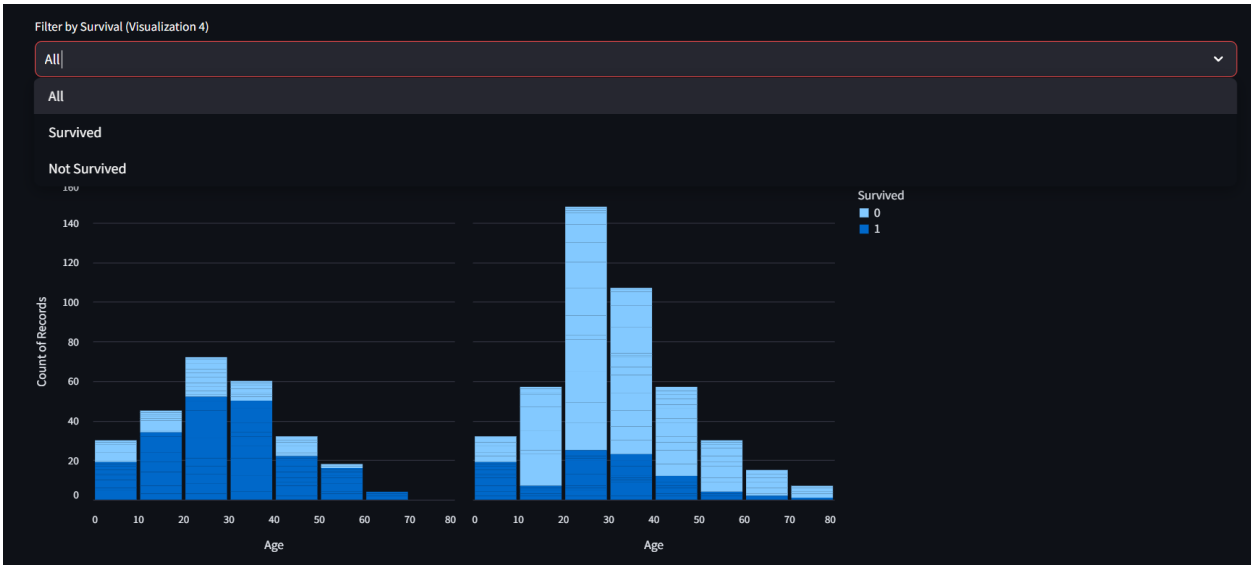


Figure 11

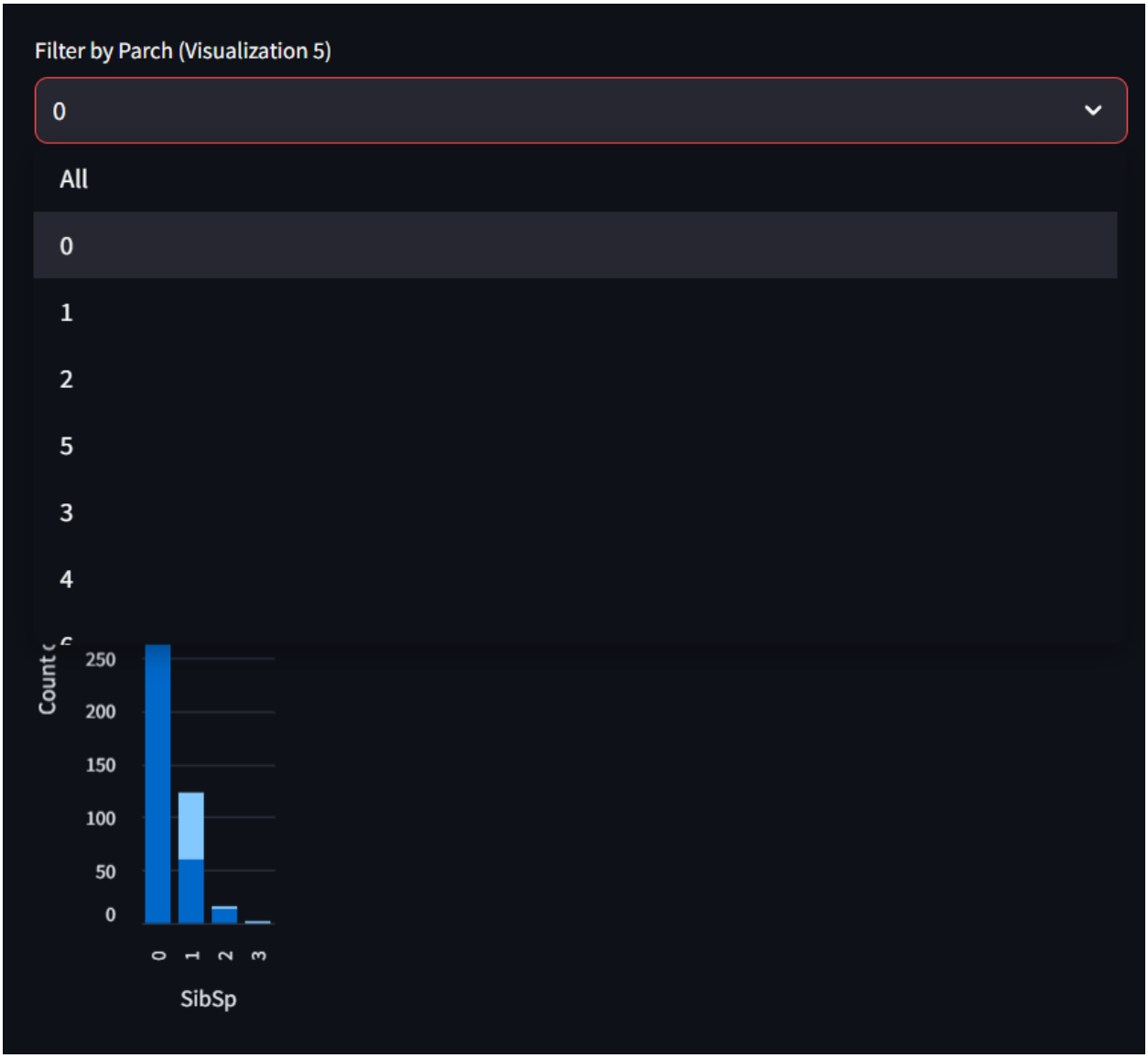


Figure 12

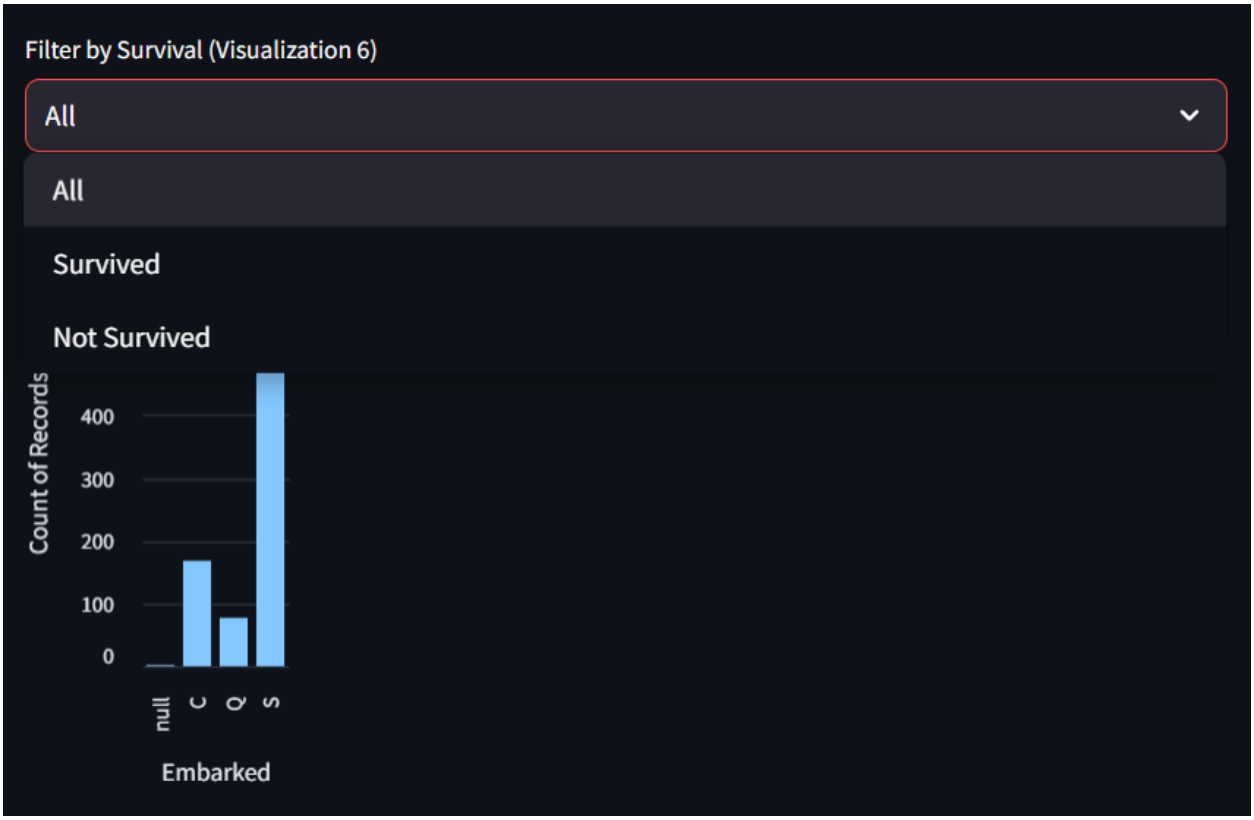


Figure 13

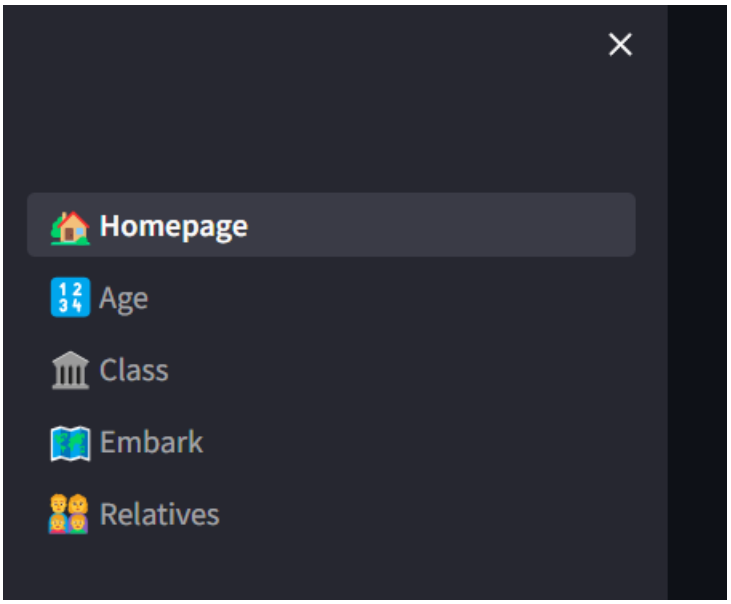


Figure 14

Navigation to Other Pages; To access additional pages, use the sidebar. This includes the Homepage, Age, Class, Embark, and Relatives pages.

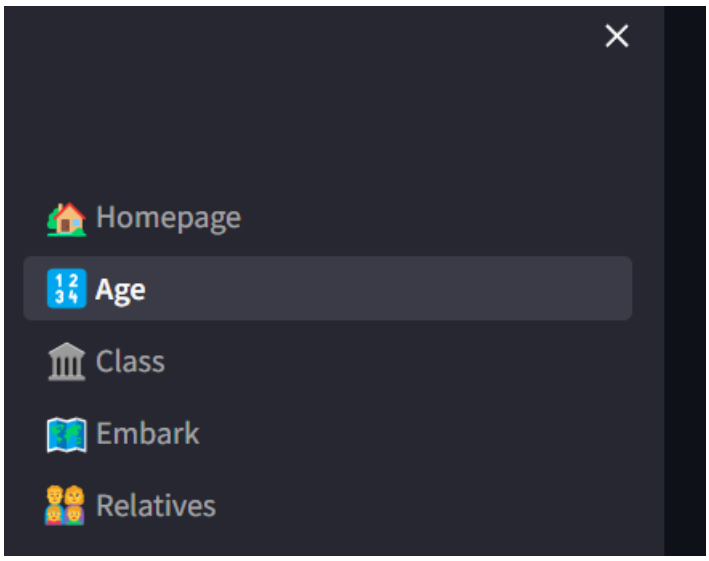


Figure 15

Age Page (Figure 16 to 18); Clicking on the Age page directs you to a dashboard with two visualizations related to age, as seen in Figure 16, 17, and 18.

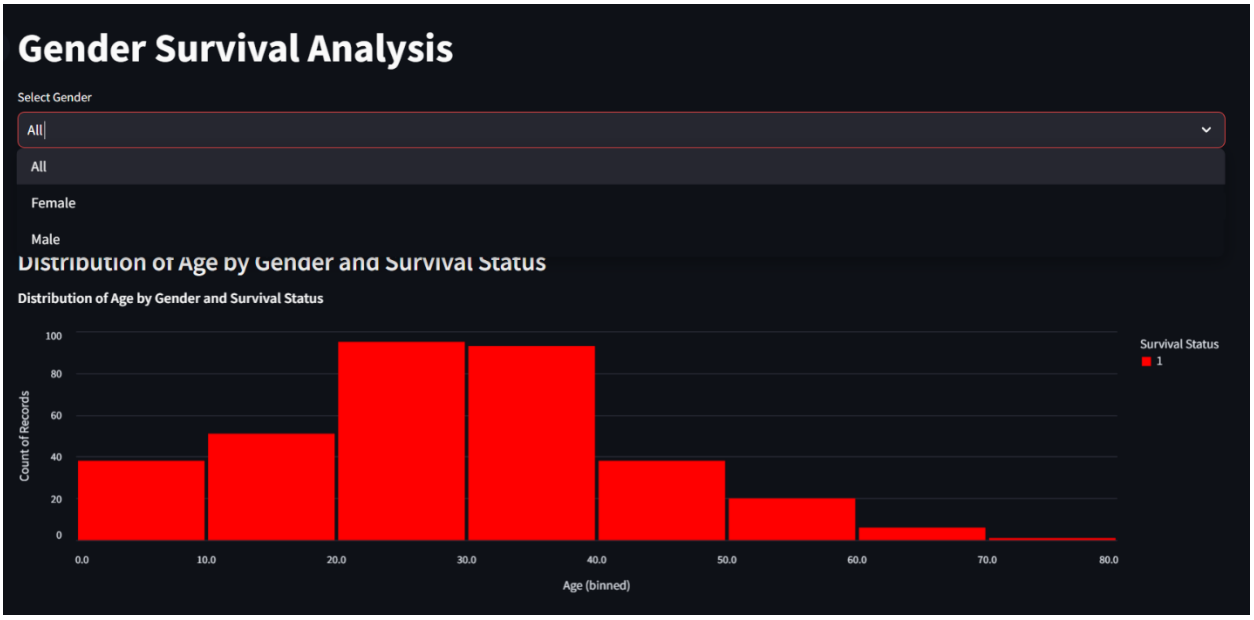


Figure 16

Figure 17

Figure 18

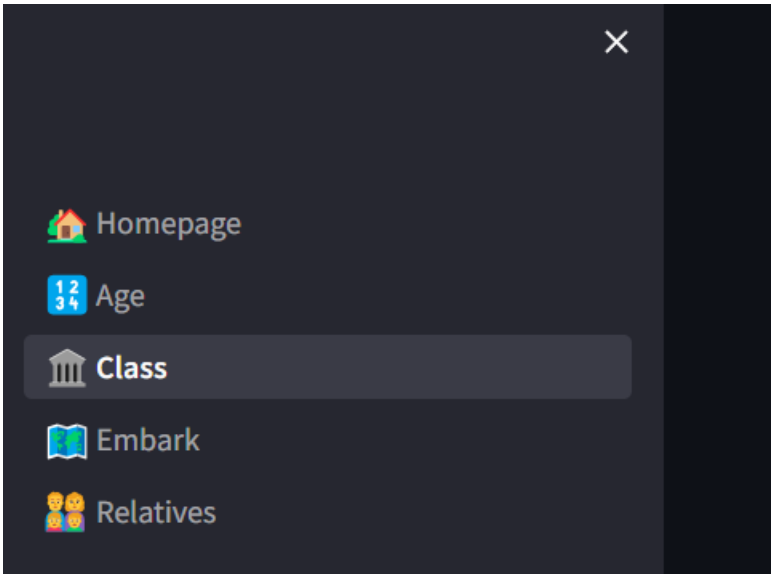


Figure 19

Classes Page (Figure 20 and 21); Navigate to the Classes page to discover two visualizations associated with ticket classes, displayed in Figure 20 and 21.

Figure 20

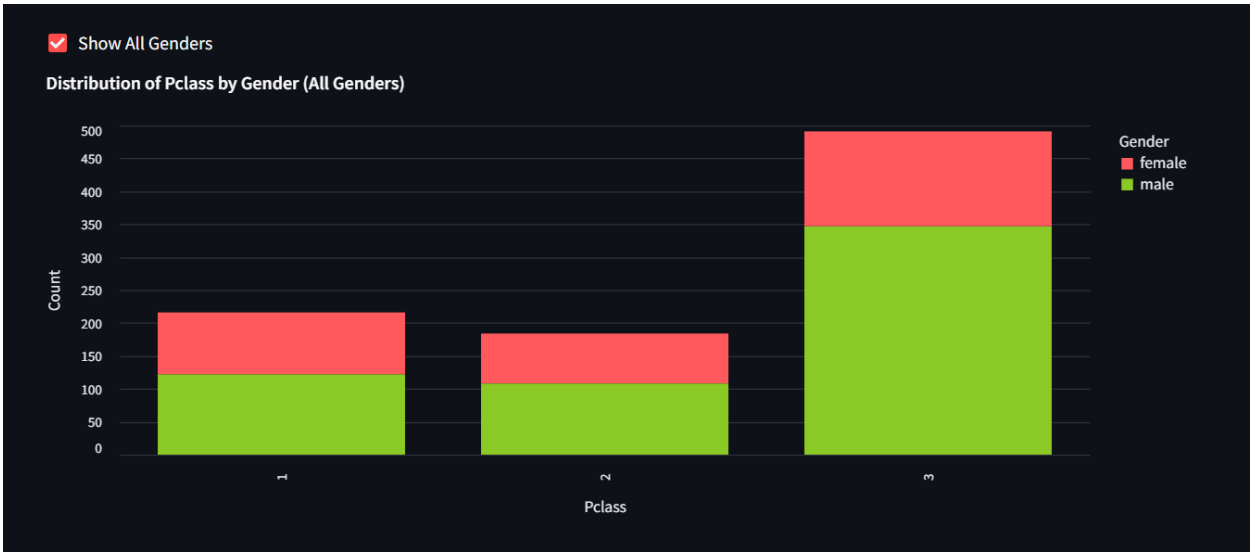


Figure 21

Embark Page (Figure 22 to 24); Visit the Embark page for two additional visualizations related to embarkations, both in histogram format. Explore Figure 22, 23, and 24.

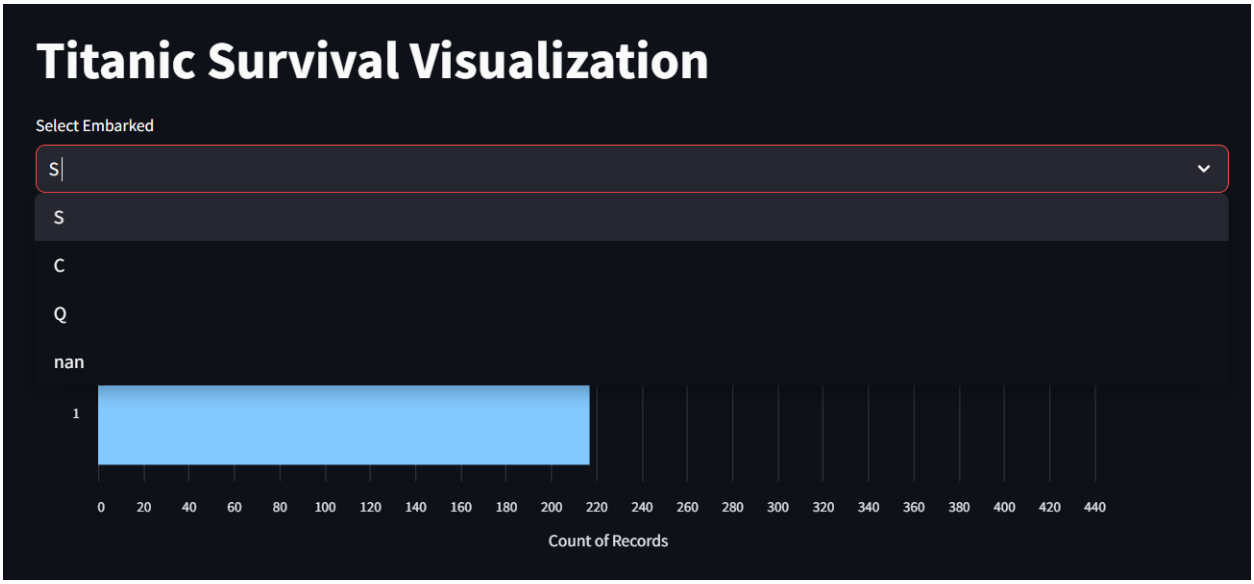


Figure 22

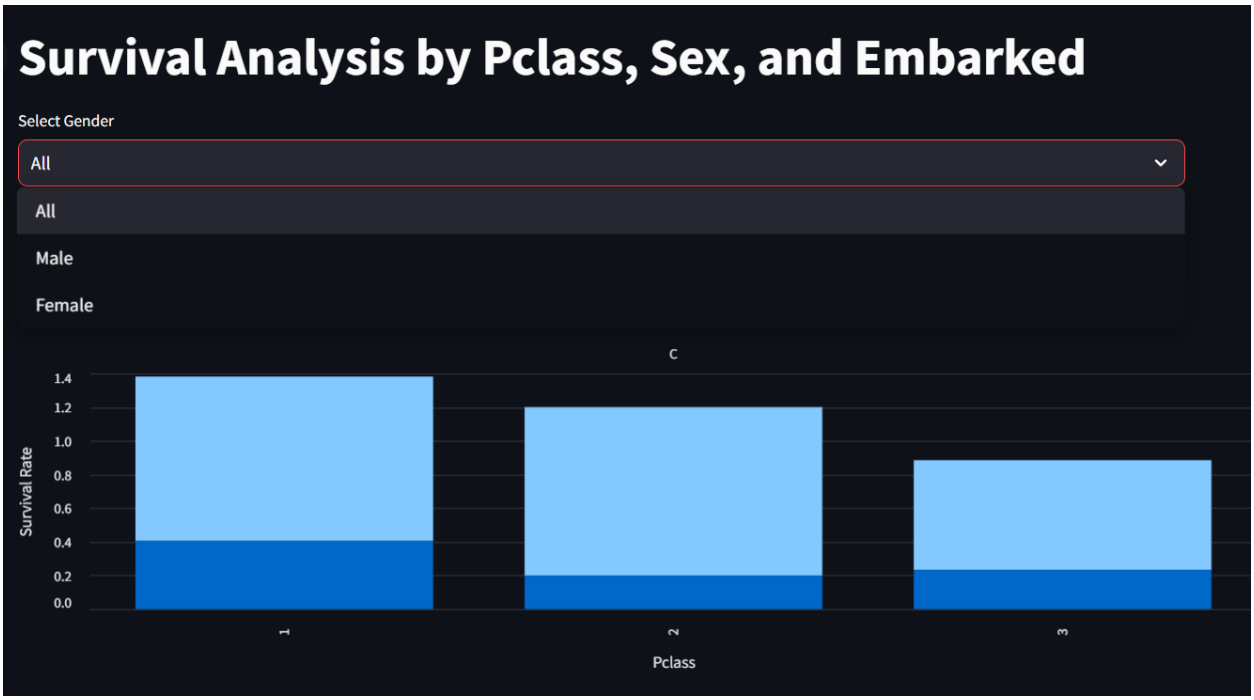


Figure 23

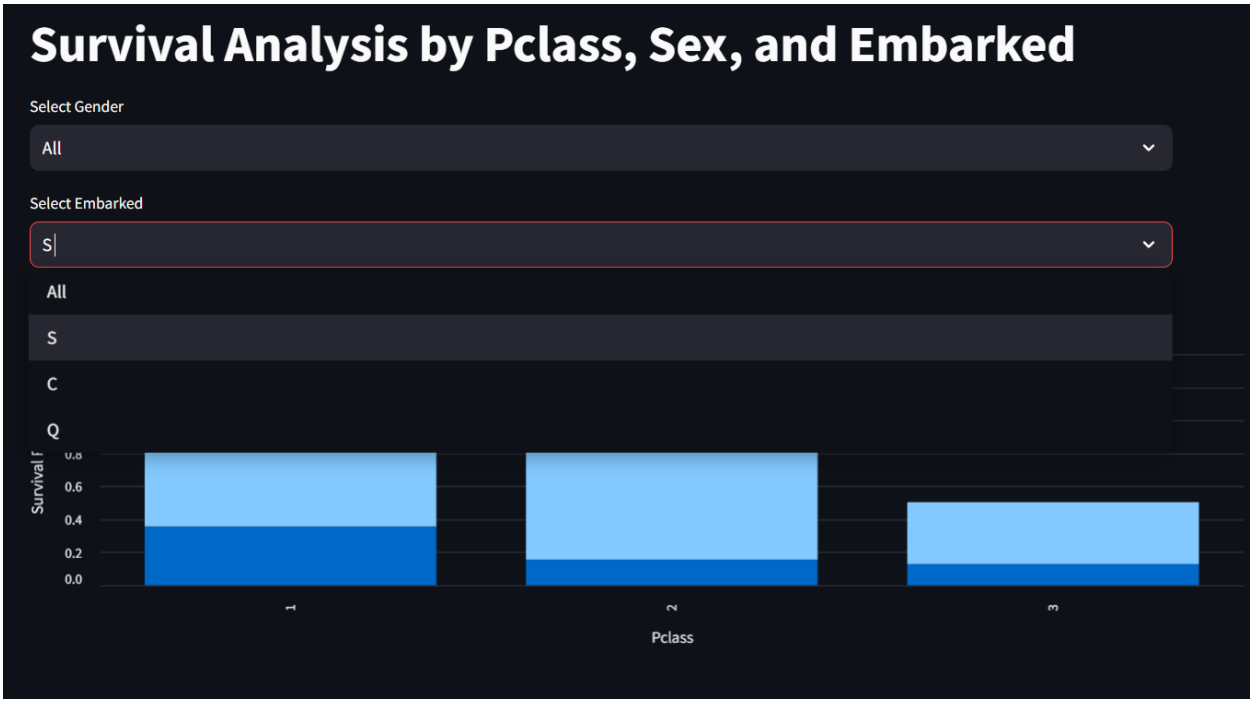


Figure 24

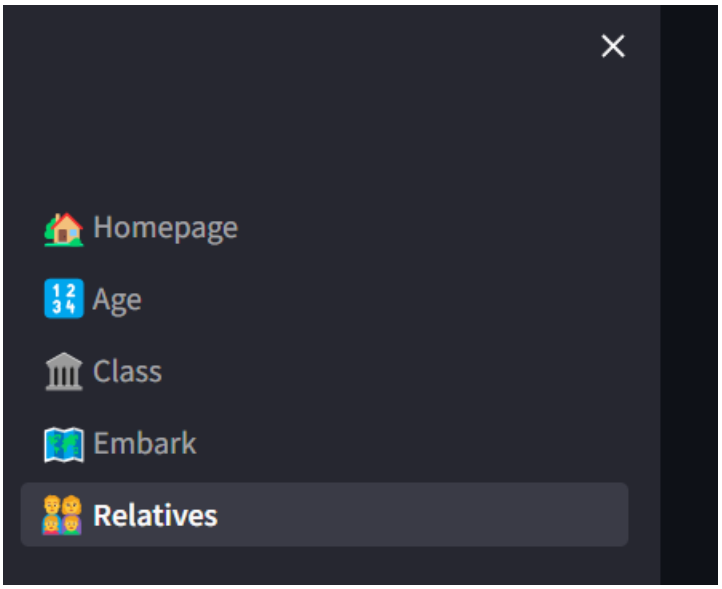


Figure 25

Relatives Page (Figure 26 and 27); Finally, explore the Relatives page with the last two visualizations. Figure 26 displays survived relatives via a bar chart or scatter plot, while Figure 27 features an interactive scatter plot.

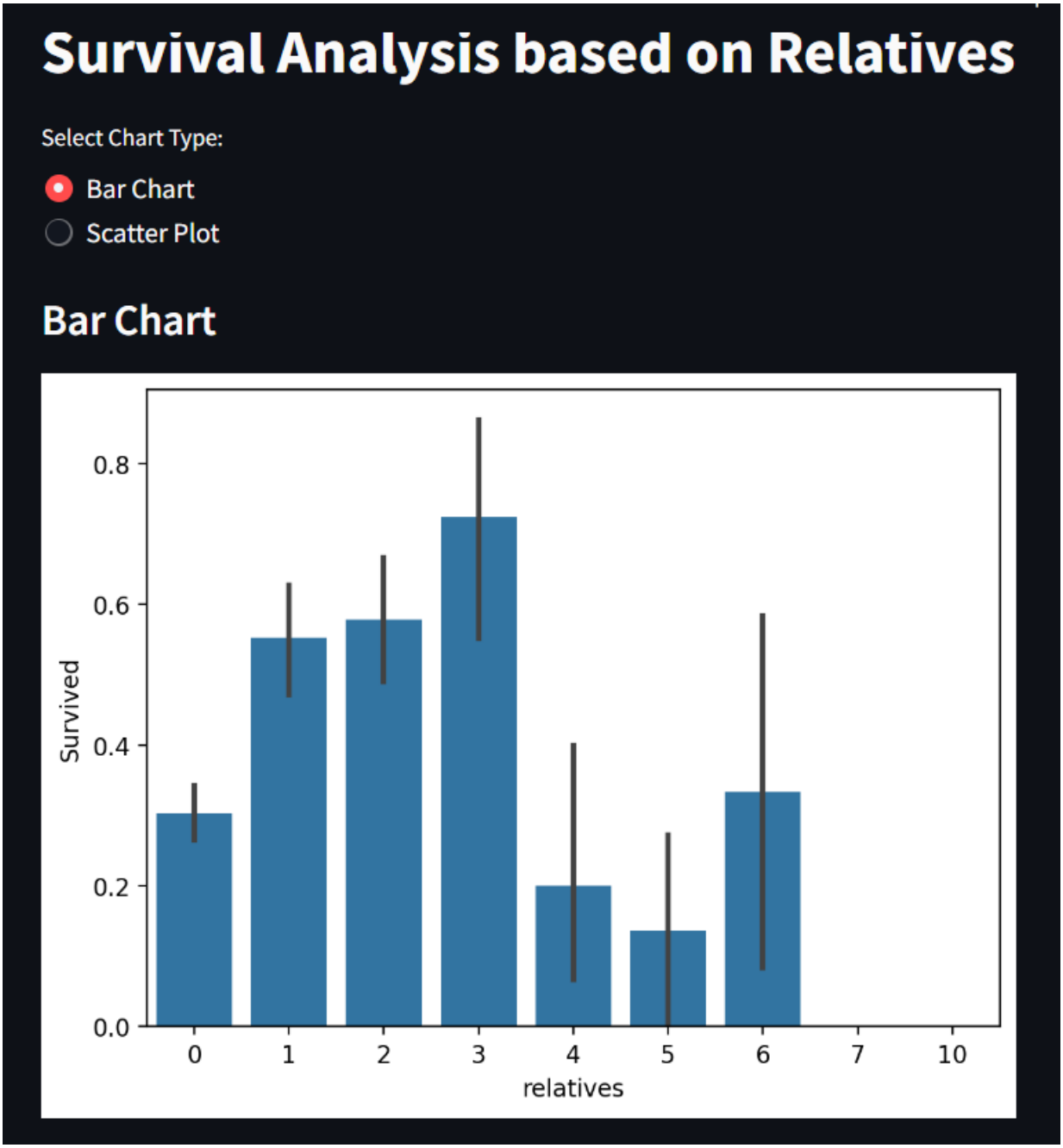

Survival Analysis based on Relatives
Select Chart Type:
Bar Chart
Scatter Plot
Bar Chart
Survived
0.0
0.2
0.4
0.6
0.8
0
1
2
3
4
5
6
7
10
relatives

Figure 26

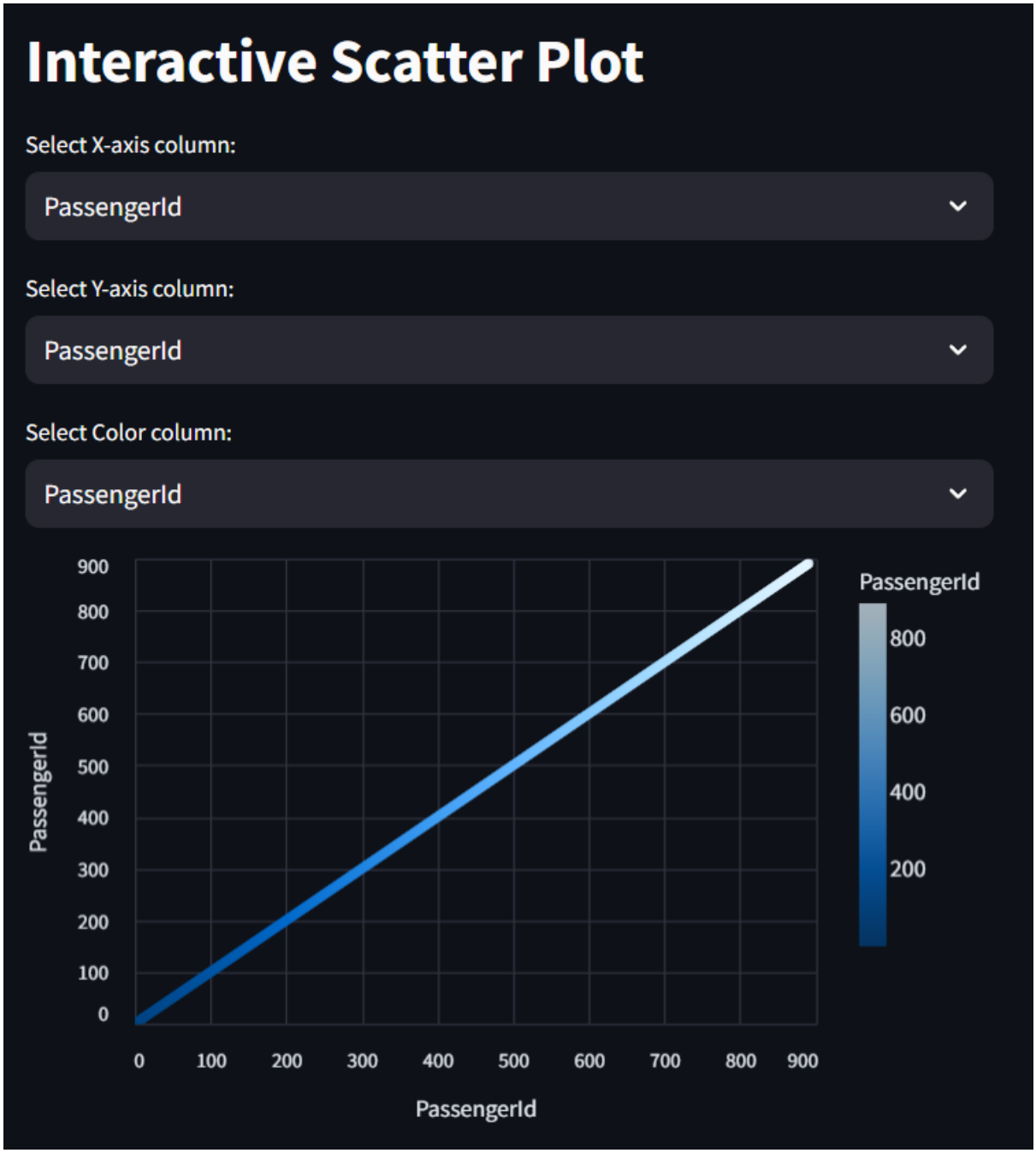


Figure 27

You may use this user manual as a detailed guide to make sure you have an easy time navigating through the many pages and visualizations in our program.

Recommendations

We've started a path of continuous improvement and have found important areas of our application that need focus. We identify both the qualities that make us unique and the shortcomings that present chances for improvement by means of a comprehensive assessment. We provide suggestions in this part to strengthen our application and bring it even closer to our main goals.

Strengths:

1. Diverse Information Pages: The strength of our program is its careful layout, providing separate pages for various survival metrics. This methodical technique improves user discovery by offering a sophisticated comprehension of several aspects associated with Titanic survival.

2. Simplicity in Design: A fundamental component of our design philosophy is simplicity. The simple design facilitates effortless navigation and comprehension, accommodating users with diverse degrees of proficiency in data analysis. This ease of use and smoothness are enhanced by its simplicity.

Weaknesses:

1. Overreliance on Bar Charts: Although useful, an over-reliance on bar charts might be a drawback. Expanding our toolkit of visualizations can improve user interaction and provide different viewpoints for a deeper examination.

2. Limited Color Variation: Though useful, the present color palette is dull. Examining a new color scheme enhances visual appeal and makes for a more memorable and visually appealing user experience.

Suggestions for Improvement:

1. Enhance Visualization Diversity: By adding scatter plots, pie charts, and line graphs to our repertoire of visualizations, we can better depict data and cater to a variety of user preferences and learning styles.

2. Revamp Color Scheme for Impact: By carefully examining color schemes, we can improve our application's visual appeal and facilitate more efficient data transfer. Selecting colors wisely may draw attention to key points and make an interface more unified and powerful.

3. Evaluate and Improve Accuracy: It is essential to thoroughly analyze forecast accuracy. By fine-tuning algorithms based on this assessment, we may increase the accuracy of survival forecasts and reassure users about the dependability of our program.

4. Comprehensive Chart Annotations: Extensive annotations on charts augment comprehensiveness by guaranteeing that viewers may obtain significant insights from visualizations irrespective of their level of acquaintance with the topic.

By following these suggestions, we want to improve our application to new heights and make it even more helpful and enriching for our users, in addition to addressing the problems that have been highlighted.

Conclusion

We have traveled through time and data with our investigation of the Titanic dataset, which has resulted in the creation of a dashboard application. Our dedication to deciphering the intricacies underlying survival on the misguided voyage is demonstrated by this report, which covers everything from the sad loss of the RMS Titanic to the painstaking identification of critical issue statements.

Our dashboard application's primary goal has been to improve comprehension, with an accuracy target of more than 70%. Our goals, which were based on well-defined issue statements and substantiated by painstakingly gathered facts, were to pinpoint significant factors, visualize our findings, and provide users with well-informed forecasts.

The application summary demonstrates our dedication to provide an easy-to-use tool that enables in-depth examination of the Titanic dataset. Aiming to promote a thorough knowledge of survival dynamics, the Main Dashboard represents the painstaking organization and intelligent design philosophy with its numerous information sections.

Discussion on How the Application Achieved Aims and Objectives:

1. Identification of Influential Variables: Our application was effective in identifying significant variables influencing survival rates through meticulous analysis. We've given users a comprehensive grasp of the various aspects that affect Titanic survival, from gender and age to ticket class and departure location.

2. Visualization through Comprehensible Charts: The intricate visualizations on the Main Dashboard have converted intricate data patterns into charts that are simple to understand. The dataset is now more understandable and relevant thanks to this display method.

3. Empowering Users for Informed Predictions: Our intuitive interface makes it easy for users to browse the information and make well-informed predictions. The design's simplicity creates an atmosphere in which people may draw insightful inferences from the data, even if they are not experts in data analysis.

References

Report with individual authors references. (n.d.). https://apastyle.apa.org. https://apastyle.apa.org/style-grammar-guidelines/references/examples/report-individual-authors-references

Report by a government agency. (n.d.). https://apastyle.apa.org. https://apastyle.apa.org/style-grammar-guidelines/references/examples/report-government-agency-references

Appendices

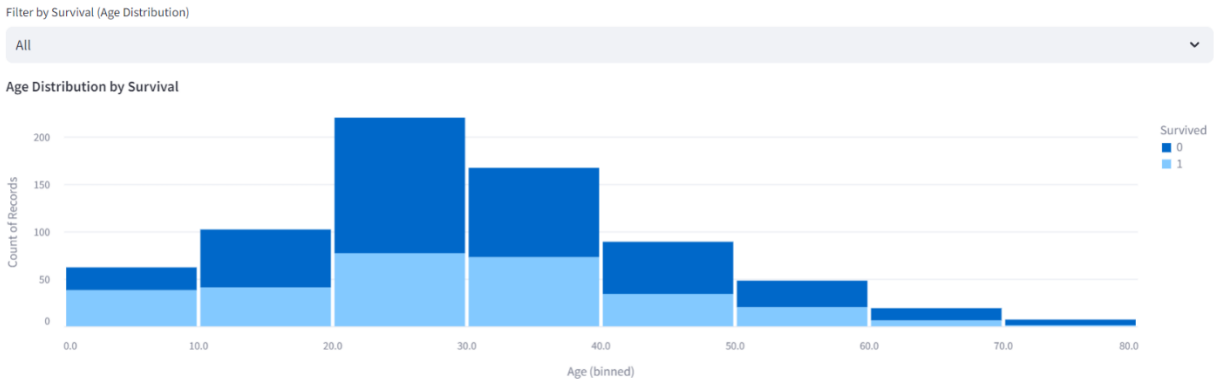


Figure 01 bar chart of age distribution by survivability

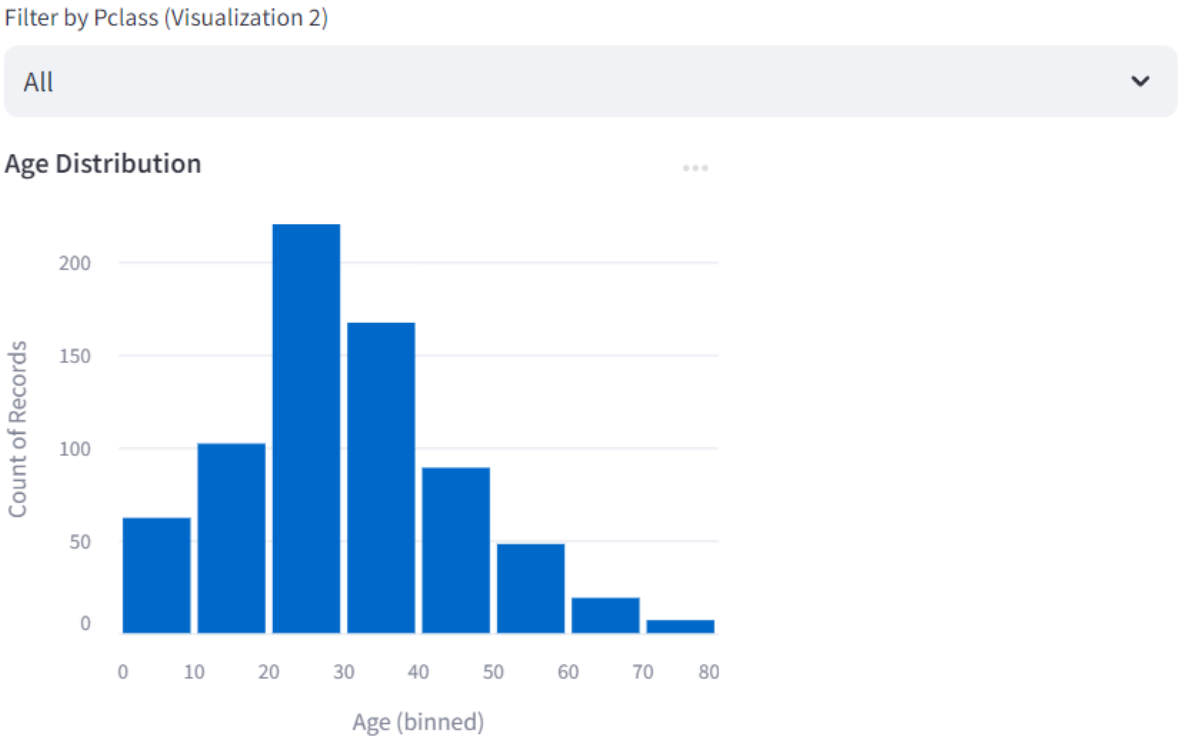


Figure 02 shows a bar chart for age distribution on ticket class

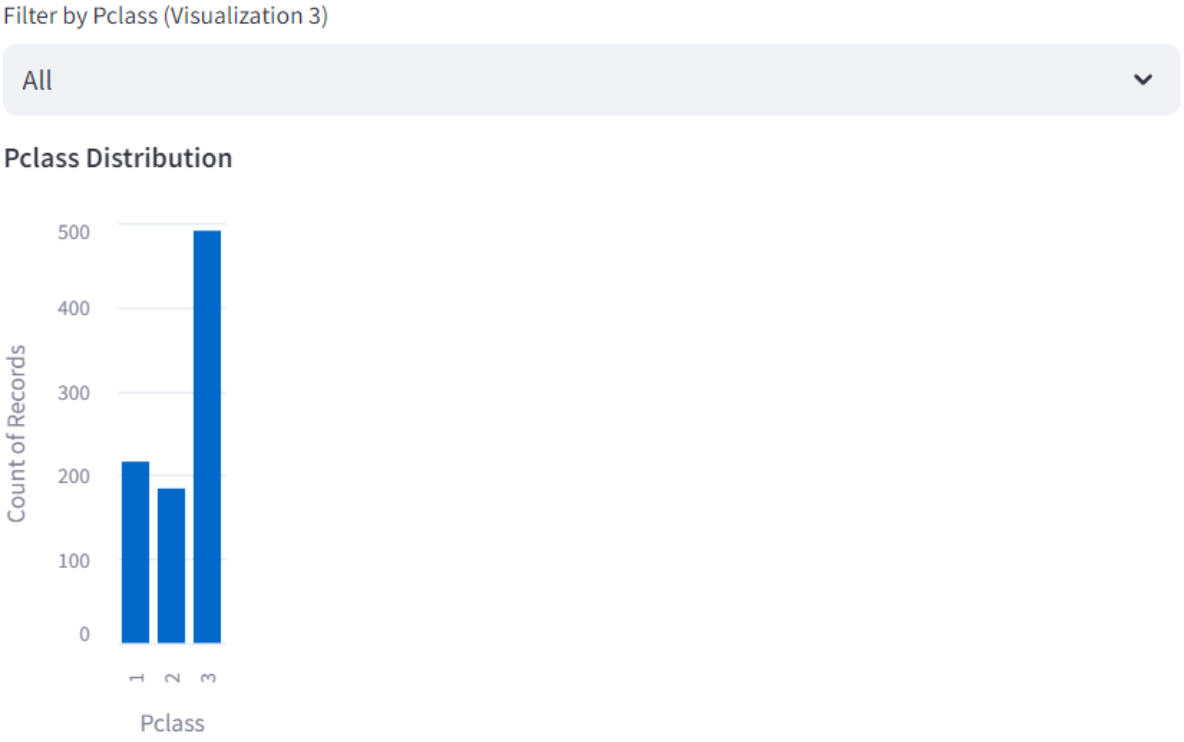


Figure 03 shows a bar chart for the survivability of different ticket classes

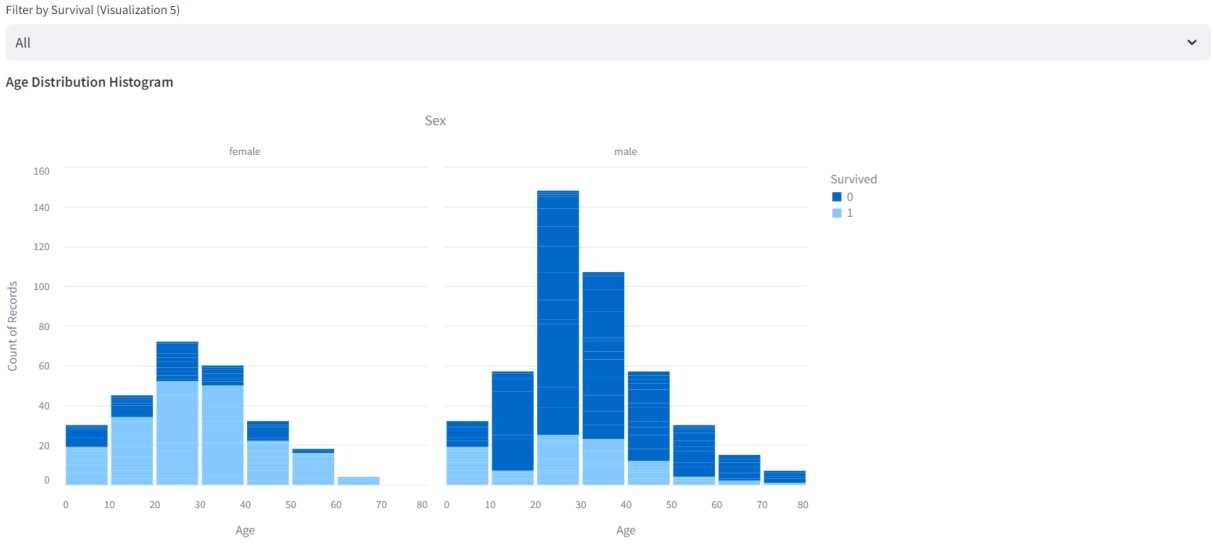
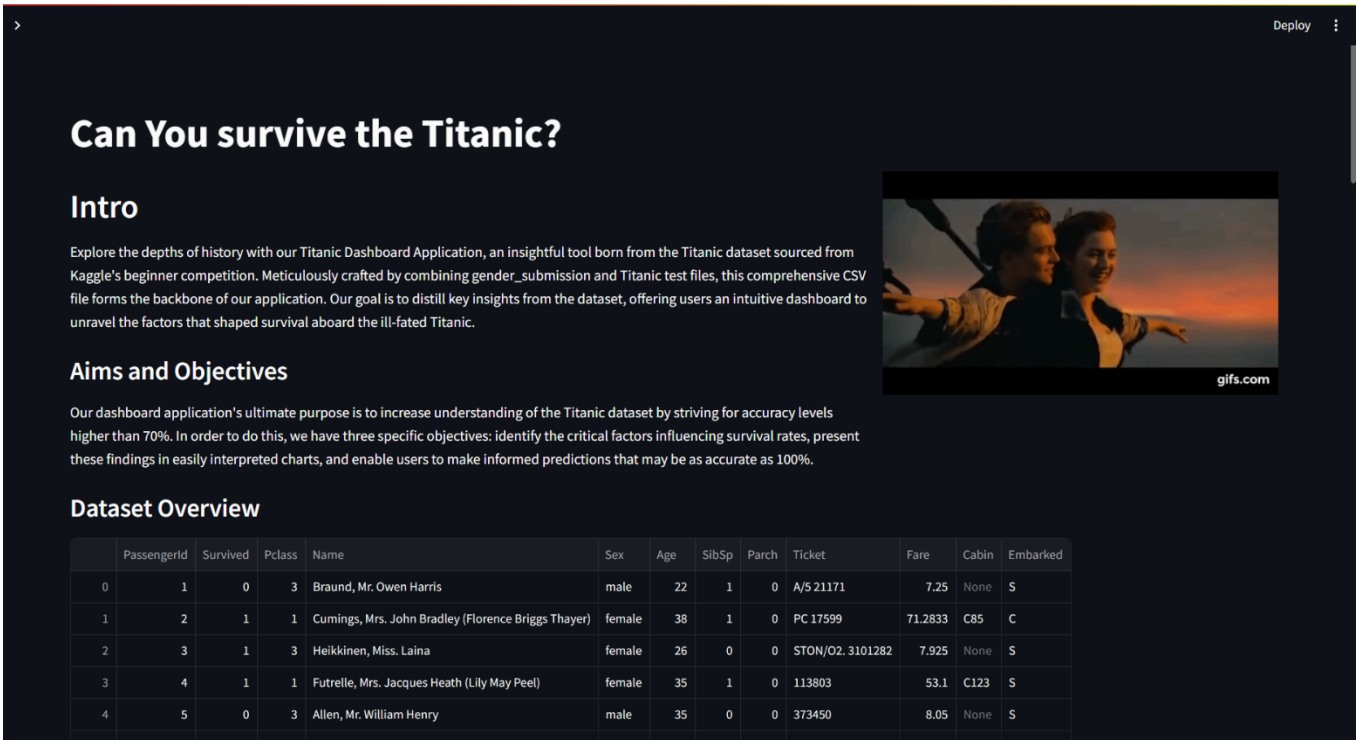


Figure 04 shows two histograms for different genders depending on their survivability

Figure 05 shows a histogram for Number of siblings by parches

Figure 06 a histogram for different embarkments survivability



	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare	Cabin	Embarked
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2	3	1	3	Heikkinen, Miss. Laina	female	26	0	0	STON/O2. 3101282	7.925	None	S
3	4	1	1	Futrelle, Mrs. Jacques Heath (Lily May Peel)	female	35	1	0	113803	53.1	C123	S
4	5	0	3	Allen, Mr. William Henry	male	35	0	0	373450	8.05	None	S

Figure 07

Figure 08


Filter by Pclass (Visualization 2)
All
All
3
1
2
Count of Re
100
50
0
0
10
20
30
40
50
60
70
80
Age (binned)

Figure 09

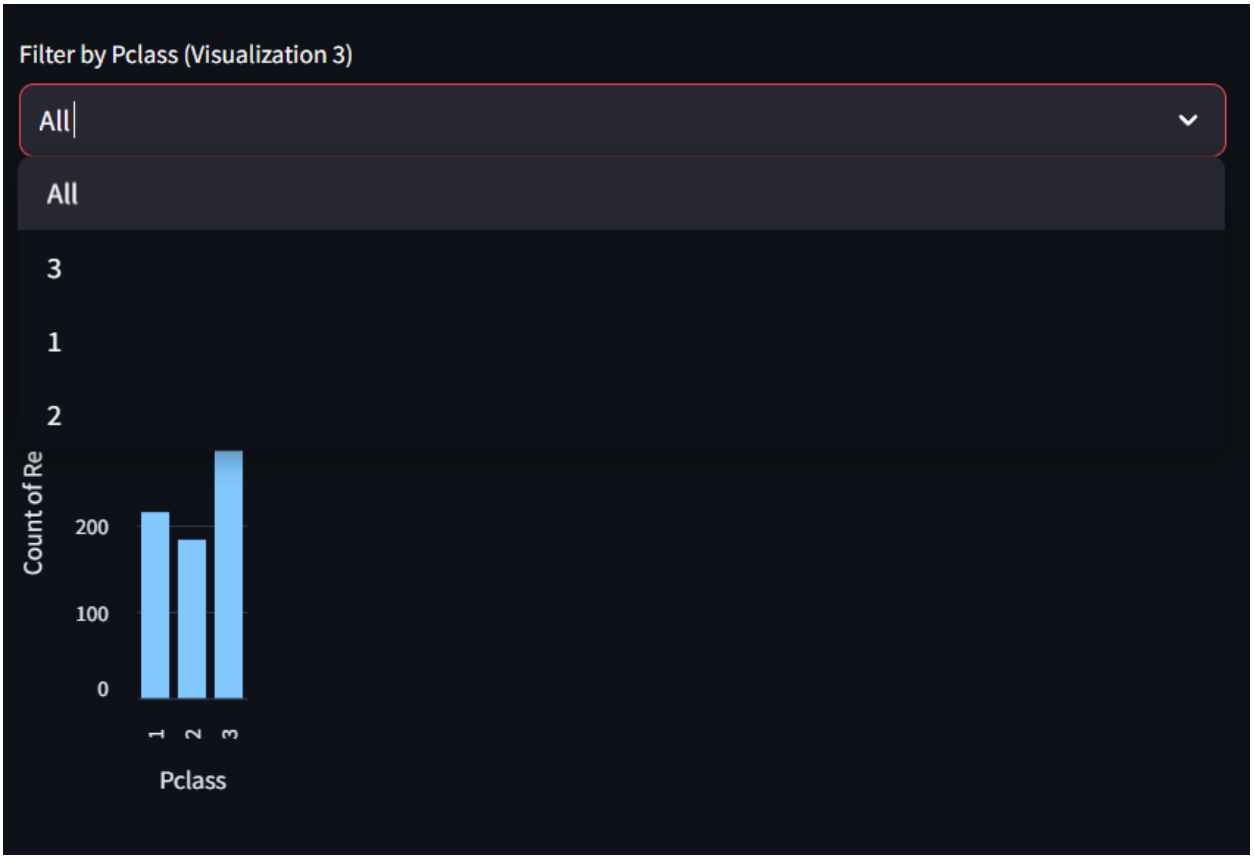


Figure 10

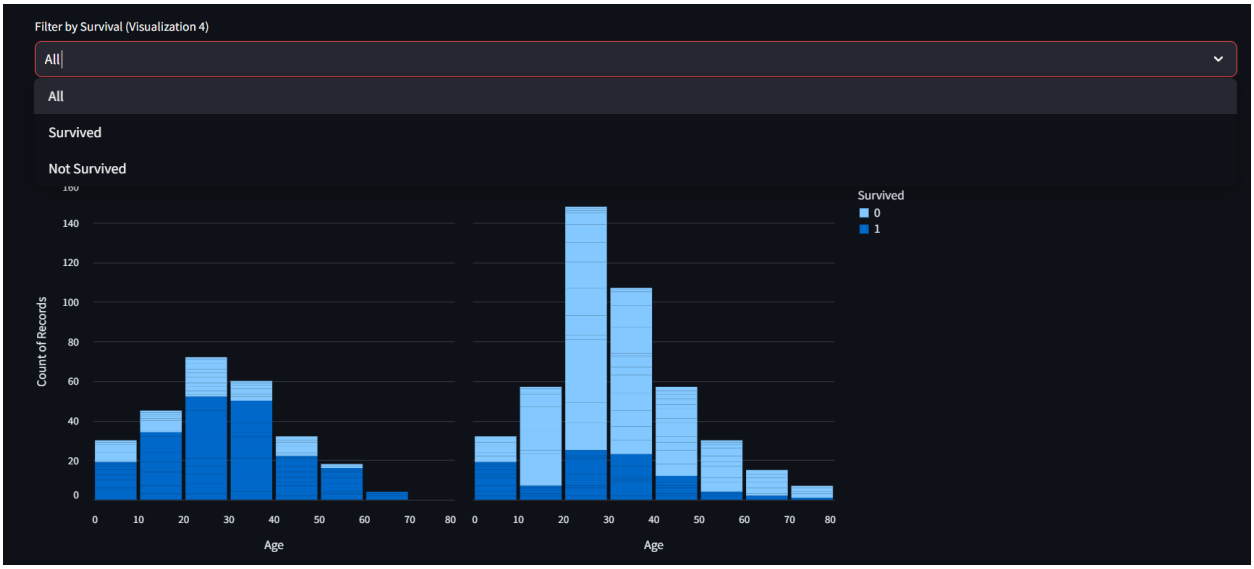


Figure 11

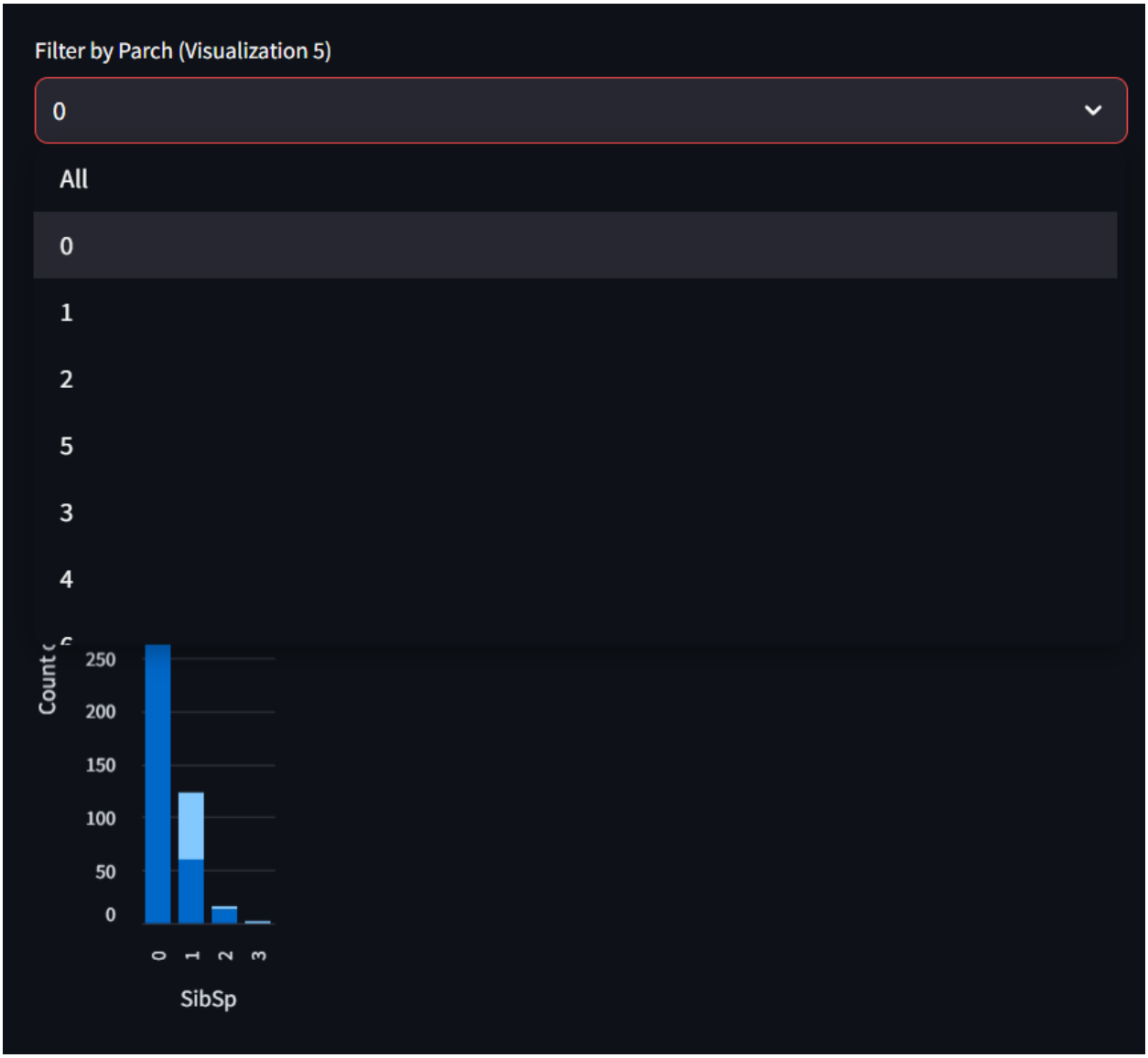

Filter by Parch (Visualization 5)
0
All
0
1
2
5
3
4
250
200
150
100
50
0
0
1
2
3
SibSp

Figure 12

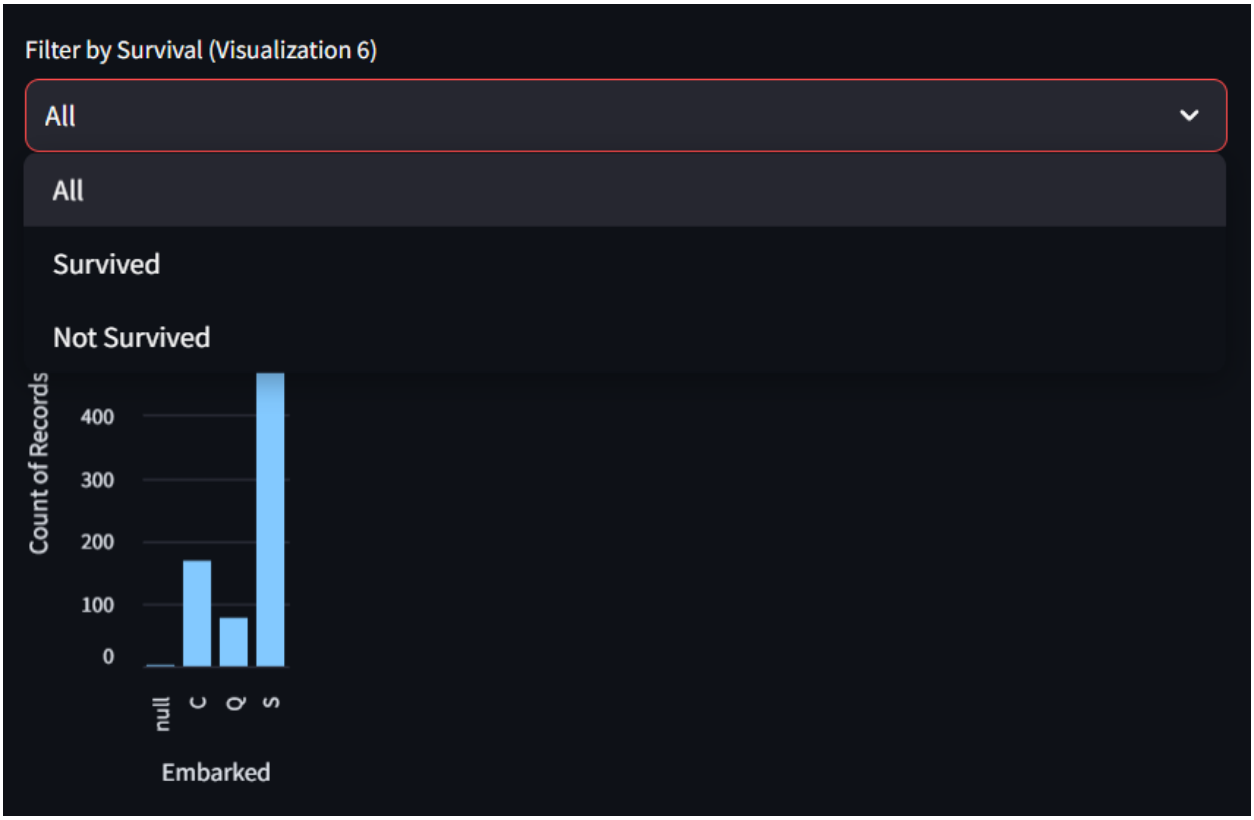


Figure 13

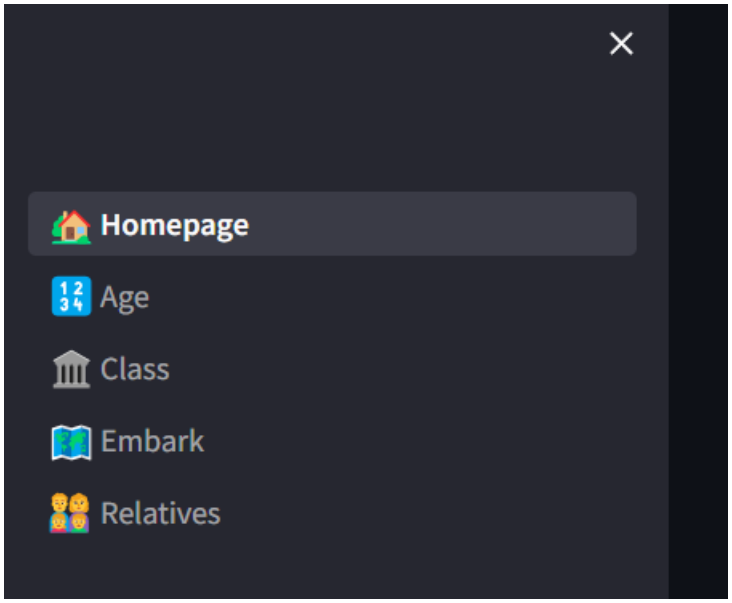


Figure 14

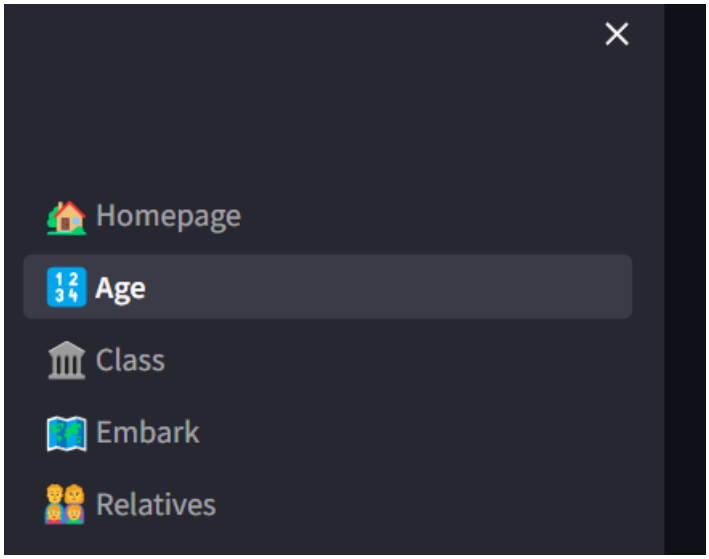


Figure 15

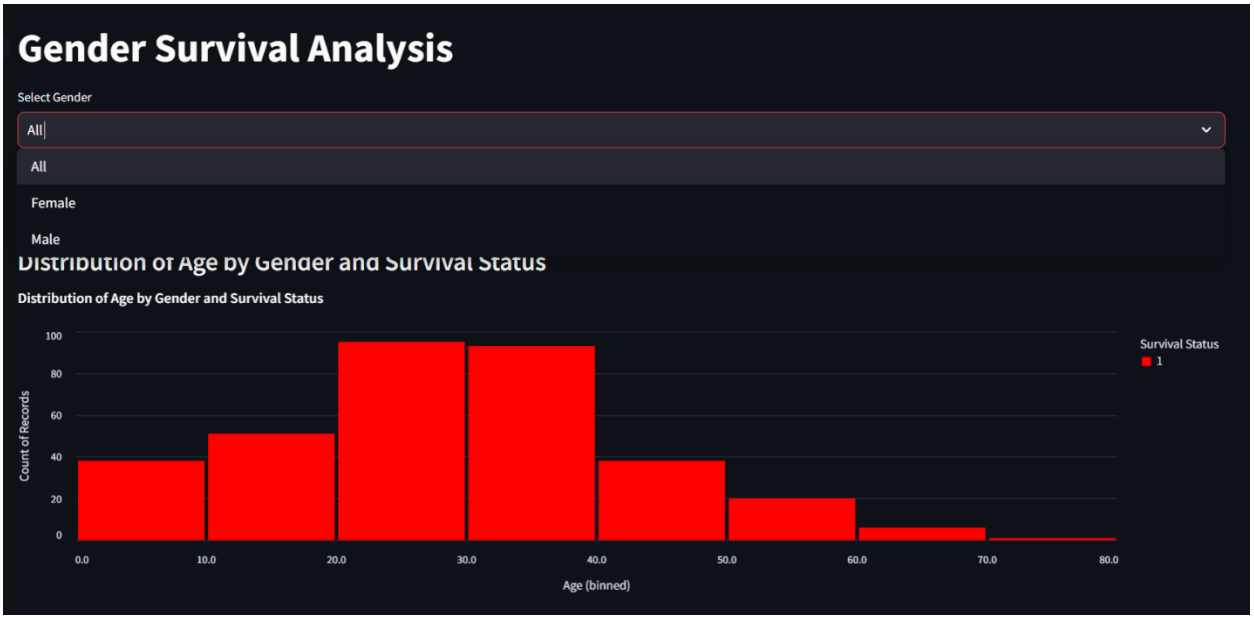


Figure 16

Figure 17

Figure 18

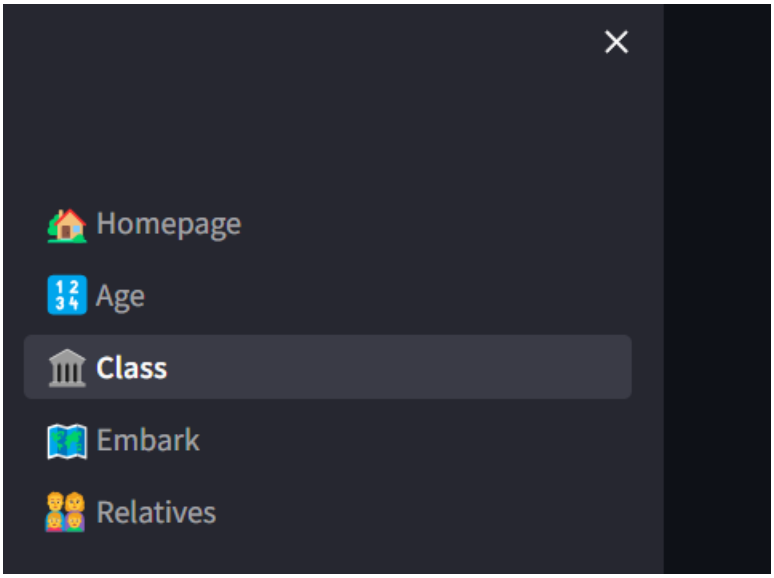


Figure 19

Figure 20

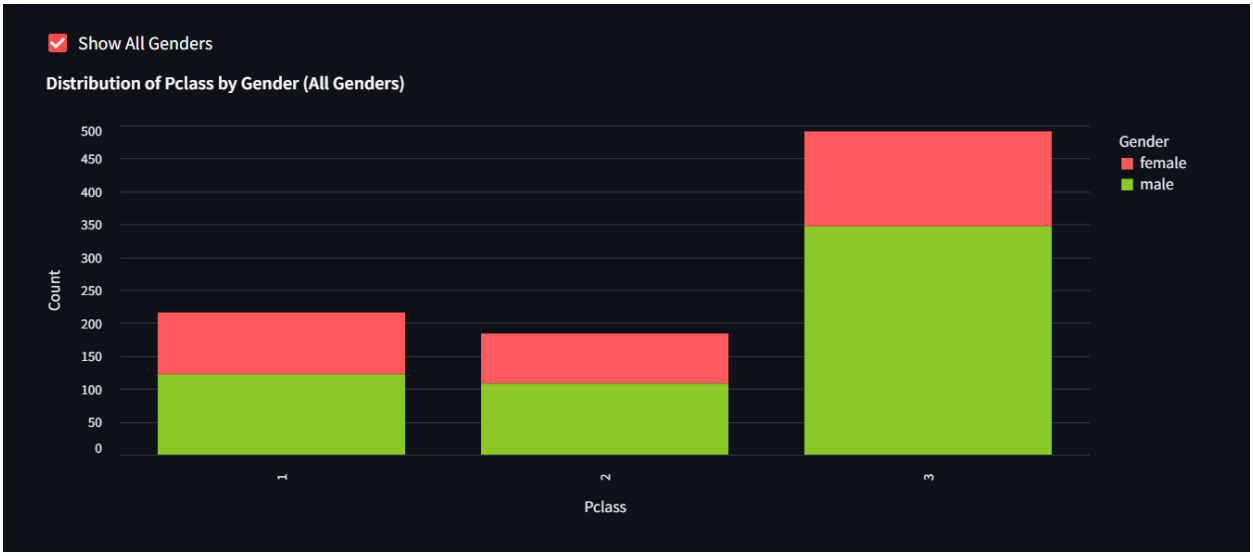


Figure 21

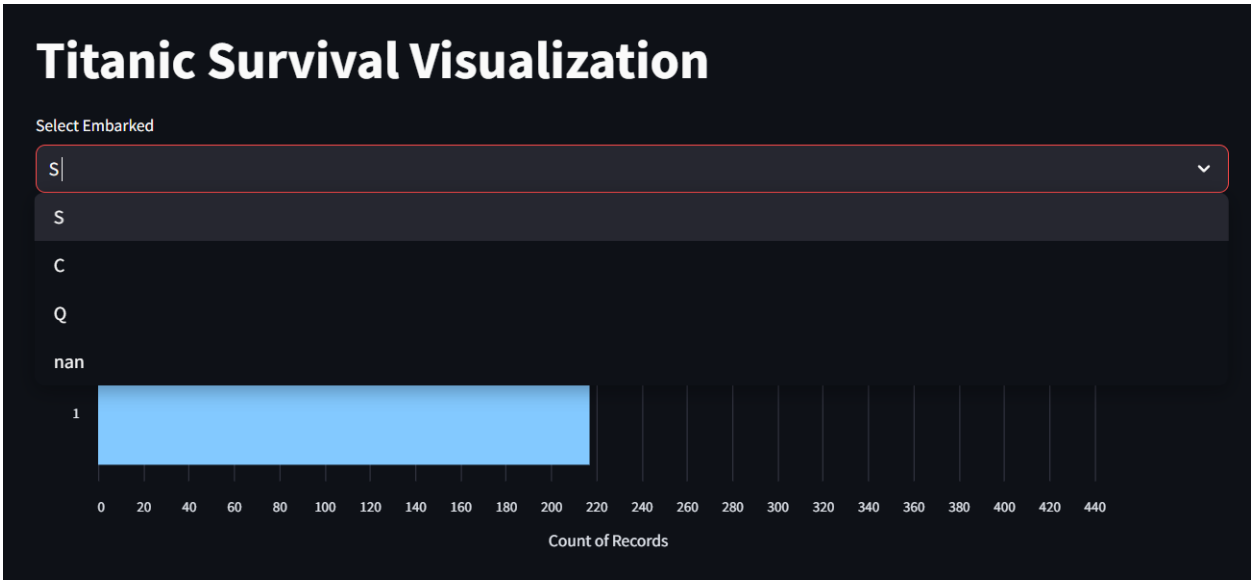
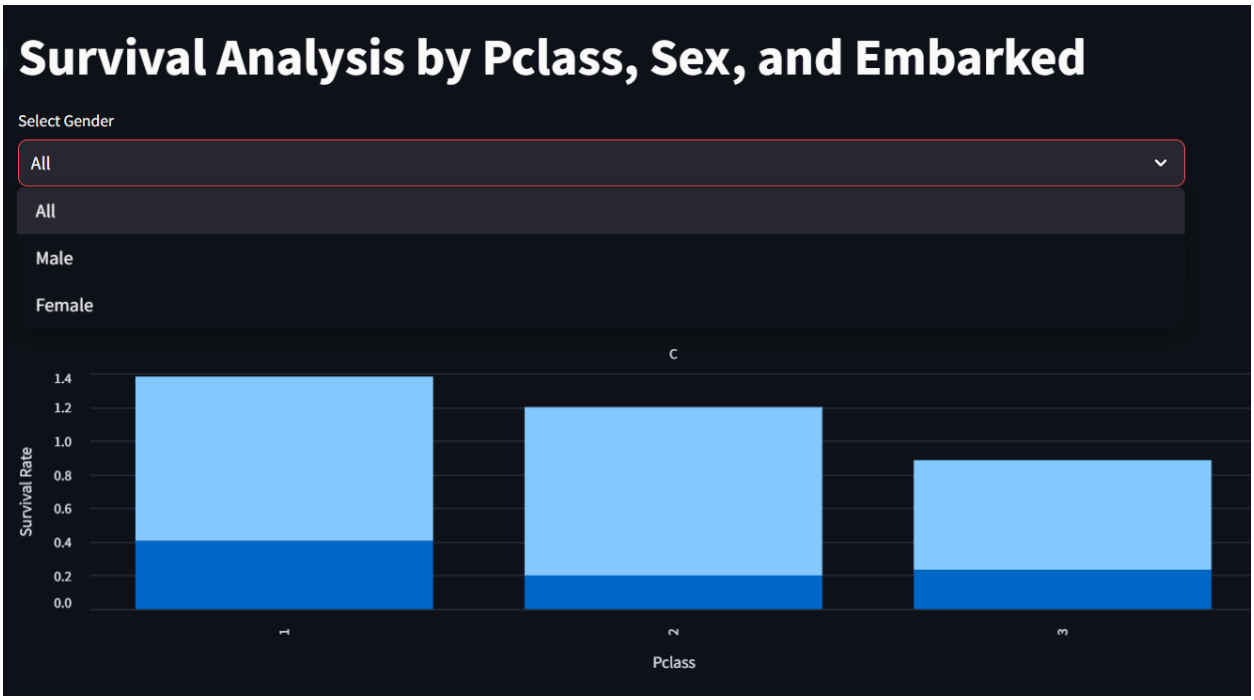


Figure 22



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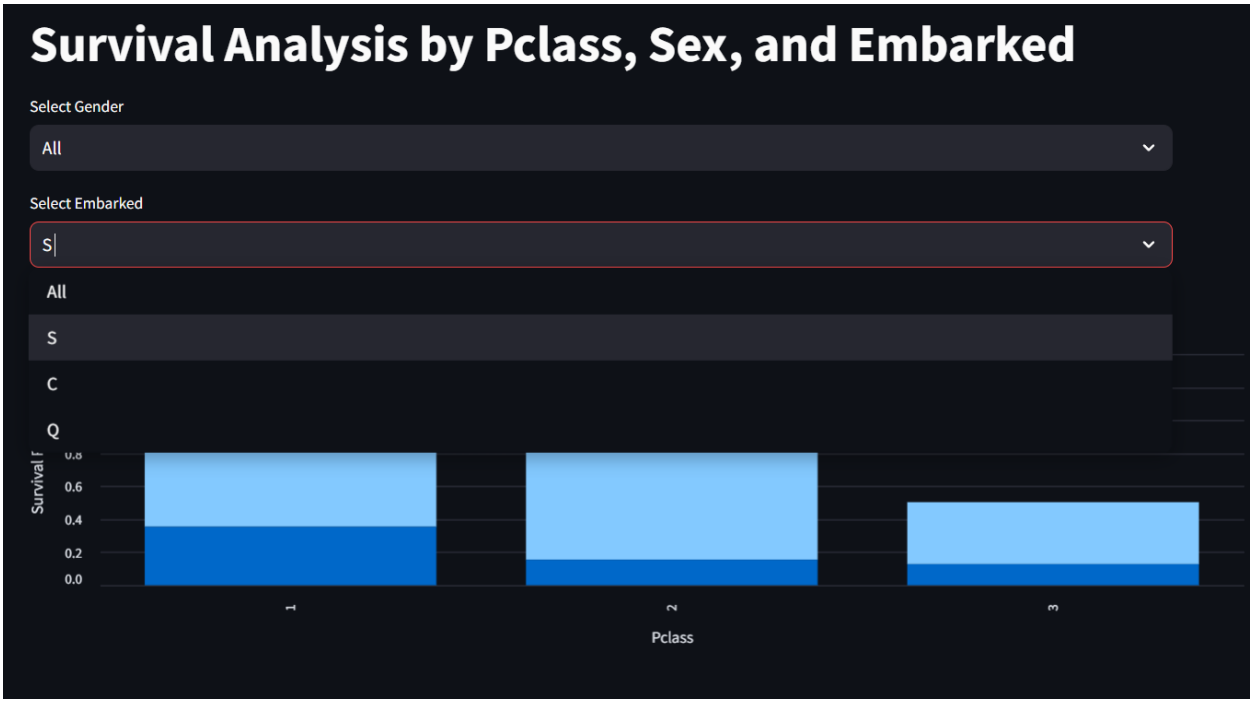
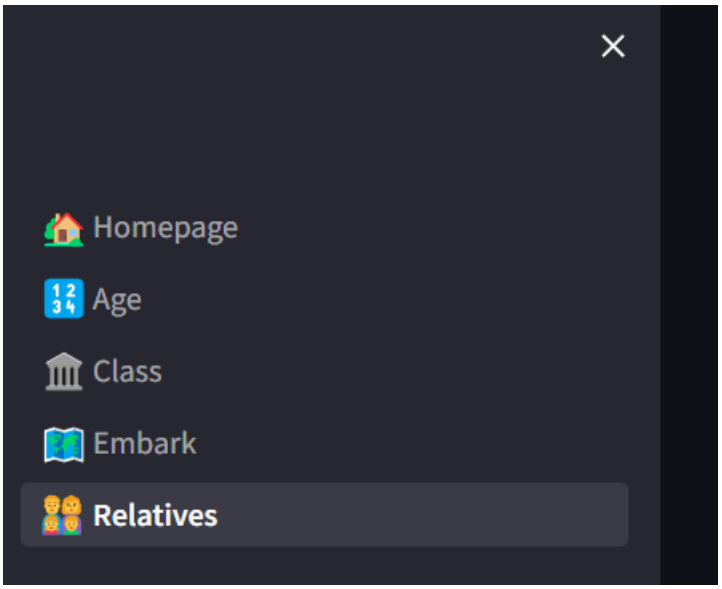


Figure 24



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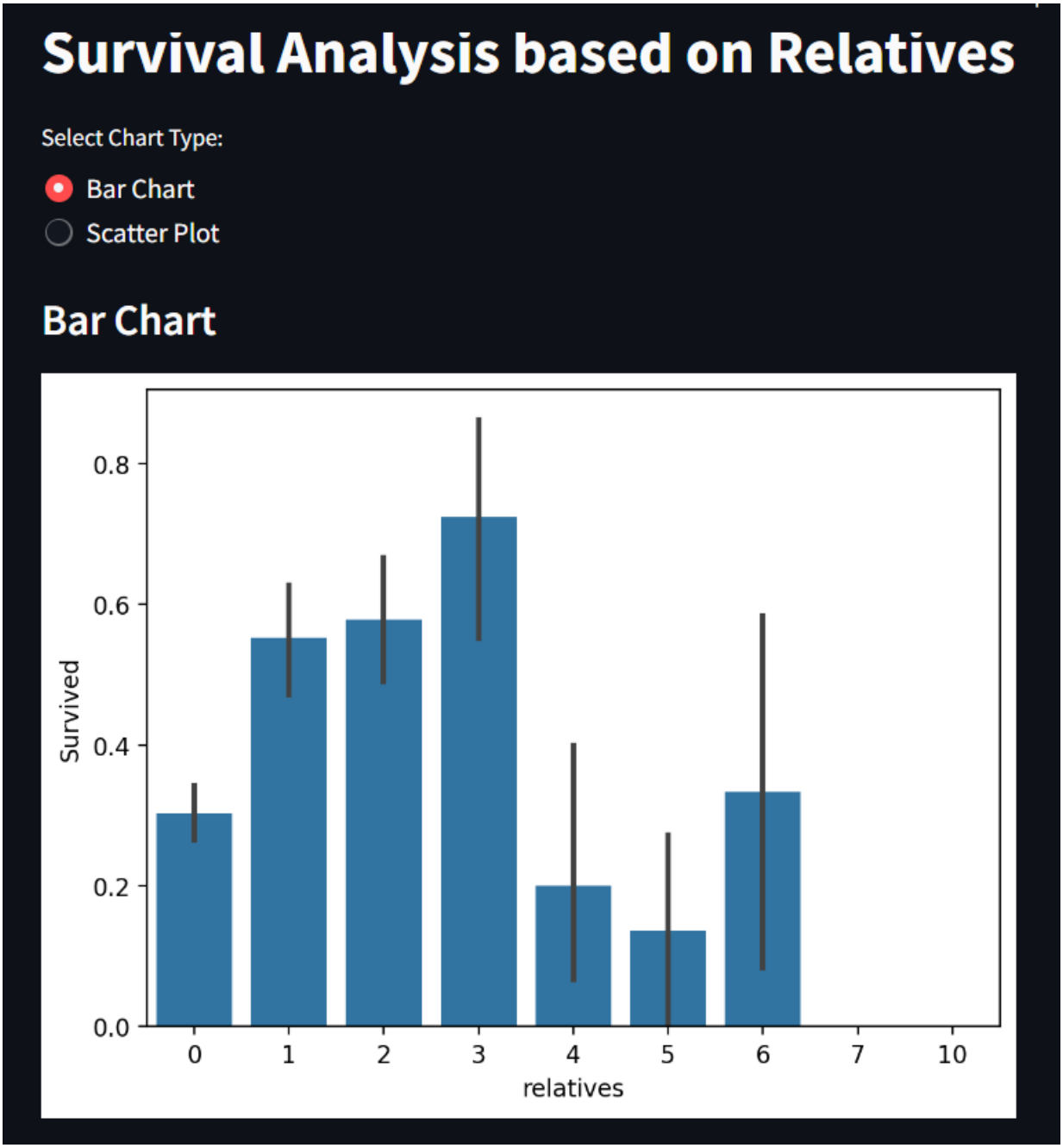
Survival Analysis based on Relatives
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Bar Chart
Scatter Plot
Bar Chart
Survived
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0.6
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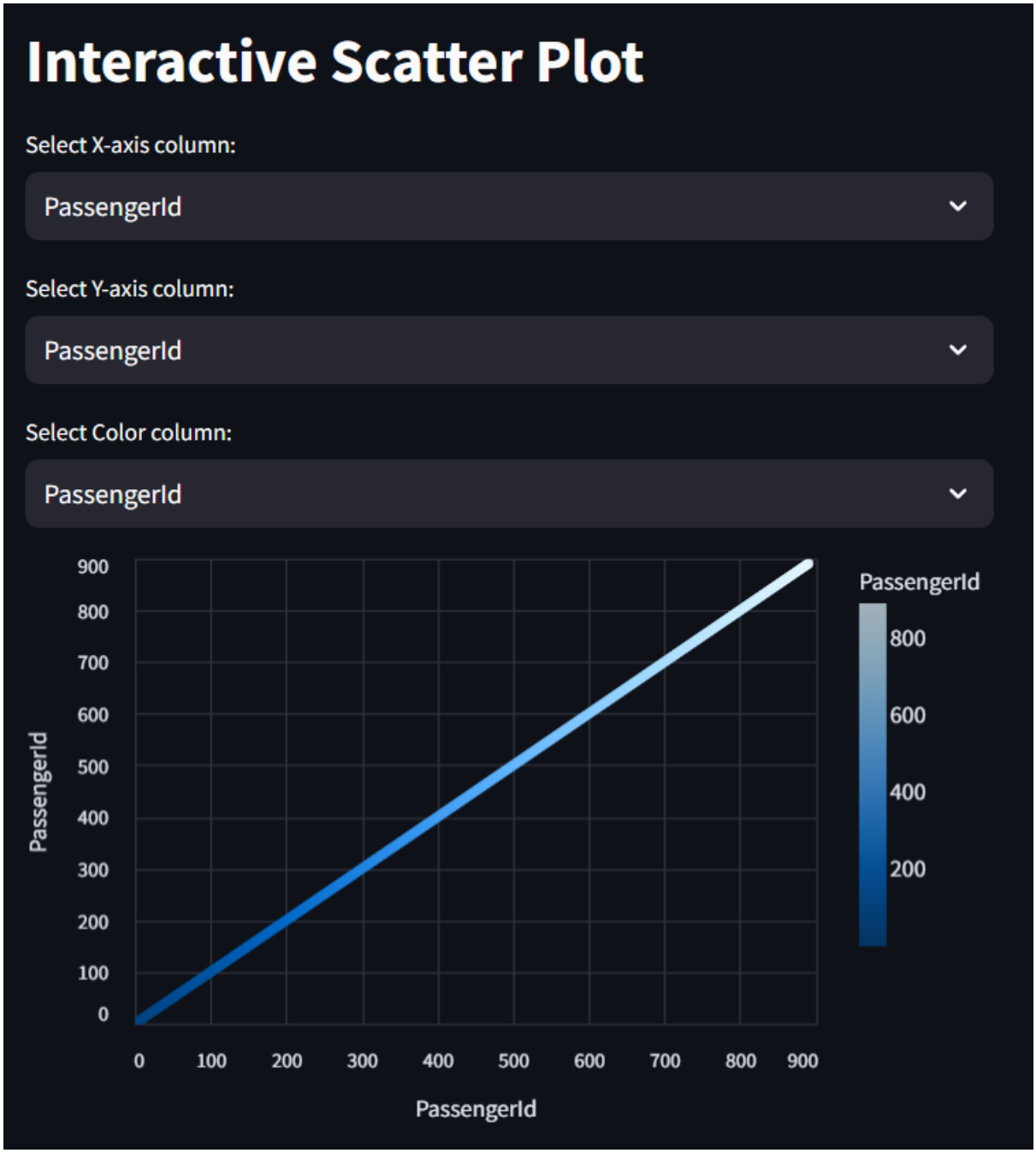
1
2
3
4
5
6
7
10
relatives

Figure 26


Interactive Scatter Plot
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Select Y-axis column:
PassengerId
Select Color column:
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200
100
0
PassengerId
0
100
200
300
400
500
600
700
800
900
PassengerId
PassengerId
800
600
400
200

Figure 27