

Exploratory Data Analysis Report - Titanic Dataset

This report presents the findings from exploratory data analysis (EDA) conducted on the Titanic dataset.

The primary goal was to uncover patterns, trends, and relationships among features that influenced passenger survival during the Titanic disaster.

1. Demographics & Survival Patterns:

- Females had a much higher survival rate than males.
- Children (Age < 10) showed higher survival, supporting the "women and children first" rule.
- The median age of survivors was lower than non-survivors.

2. Socioeconomic Impact:

- 1st class passengers had significantly higher survival rates.
- Fare and Pclass are negatively correlated; higher class meant higher fare and better survival odds.

3. Fare Insights:

- Fare distribution is right-skewed with several high-paying outliers.
- Higher fares generally correlate with increased survival probability.

4. Data Quality:

- Age column contains missing values.
- No critical multicollinearity found in numeric features.

5. Correlation Analysis:

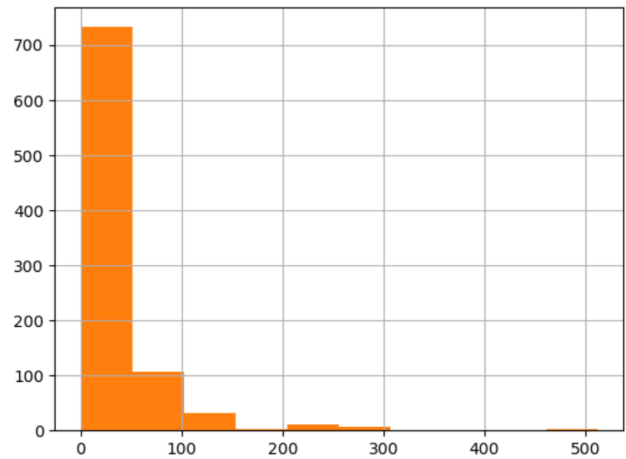
- Fare is positively correlated with survival.
- Pclass is negatively correlated with survival.

Visuals used include histograms, boxplots, bar plots, pairplots, and heatmaps.

```
[15]: df['Age'].hist()  
df['Fare'].hist()  
df
```

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare	Cabin	Embarked
0	1	0	3	Braund, Mr. Owen Harris	male	22.0	1	0	A/5 21171	7.2500	NaN	S
1	2	1	1	Cumings, Mrs. John Bradley (Florence Briggs Th...	female	38.0	1	0	PC 17599	71.2833	C85	C
2	3	1	3	Heikkinen, Miss. Laina	female	26.0	0	0	STON/O2. 3101282	7.9250	NaN	S
3	4	1	1	Futrelle, Mrs. Jacques Heath (Lily May Peel)	female	35.0	1	0	113803	53.1000	C123	S
4	5	0	3	Allen, Mr. William Henry	male	35.0	0	0	373450	8.0500	NaN	S
...
886	887	0	2	Montvila, Rev. Juozas	male	27.0	0	0	211536	13.0000	NaN	S
887	888	1	1	Graham, Miss. Margaret Edith	female	19.0	0	0	112053	30.0000	B42	S
888	889	0	3	Johnston, Miss. Catherine Helen "Carrie"	female	NaN	1	2	W./C. 6607	23.4500	NaN	S
889	890	1	1	Behr, Mr. Karl Howell	male	26.0	0	0	111369	30.0000	C148	C
890	891	0	3	Dooley, Mr. Patrick	male	32.0	0	0	370376	7.7500	NaN	Q

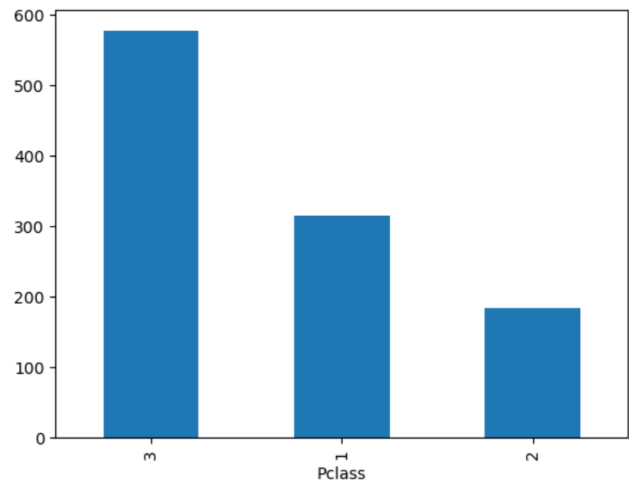
891 rows × 12 columns



```
[17]: df['Sex'].value_counts().plot(kind='bar')
df['Pclass'].value_counts().plot(kind='bar')
df
```

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare	Cabin	Embarked
0	1	0	3	Braund, Mr. Owen Harris	male	22.0	1	0	A/5 21171	7.2500	NaN	S
1	2	1	1	Cumings, Mrs. John Bradley (Florence Briggs Th...	female	38.0	1	0	PC 17599	71.2833	C85	C
2	3	1	3	Heikkinen, Miss. Laina	female	26.0	0	0	STON/O2. 3101282	7.9250	NaN	S
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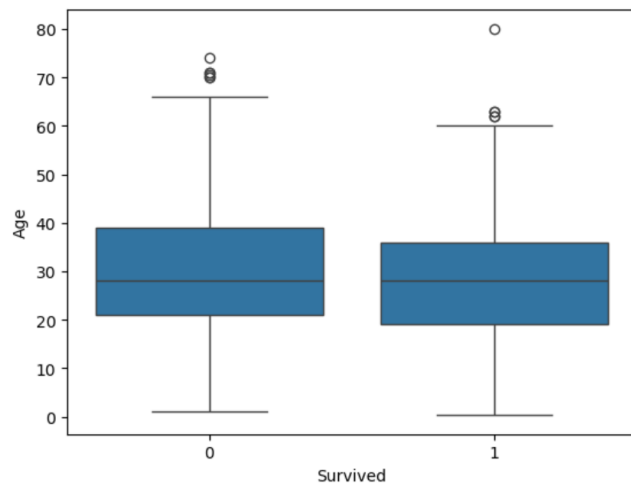
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```
[19]: sns.boxplot(x='Survived', y='Age', data=df)
df
```

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare	Cabin	Embarked
0	1	0	3	Braund, Mr. Owen Harris	male	22.0	1	0	A/5 21171	7.2500	NaN	S
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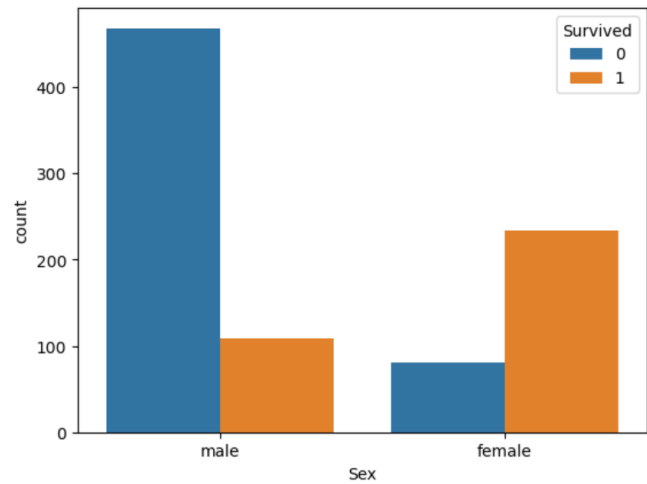
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```
[21]: sns.countplot(x='Sex', hue='Survived', data=df)
df
```

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare	Cabin	Embarked
0	1	0	3	Braund, Mr. Owen Harris	male	22.0	1	0	A/5 21171	7.2500	NaN	S
1	2	1	1	Cumings, Mrs. John Bradley (Florence Briggs Th...	female	38.0	1	0	PC 17599	71.2833	C85	C
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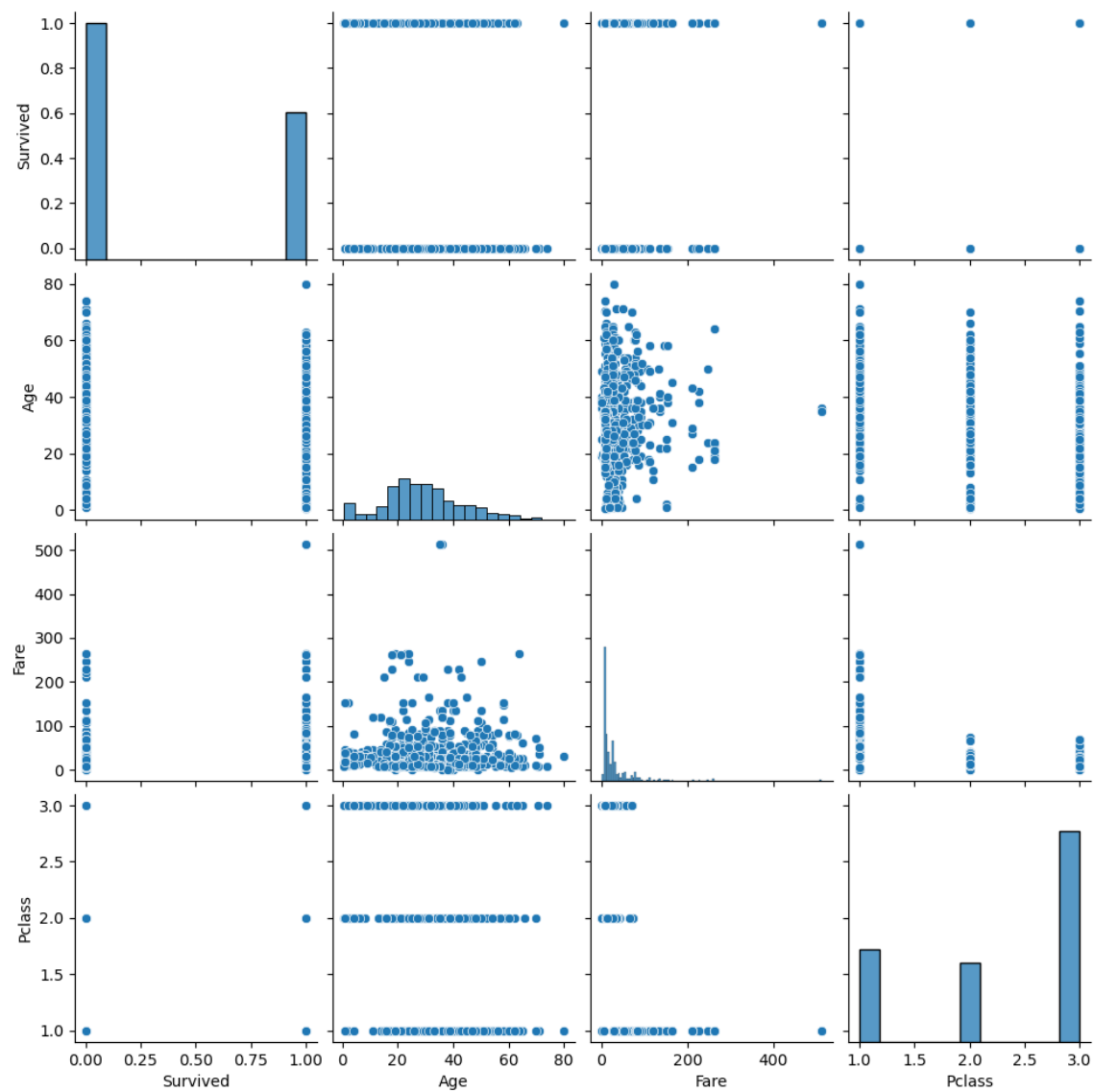


```
[23]: sns.pairplot(df[['Survived', 'Age', 'Fare', 'Pclass']])
df
```

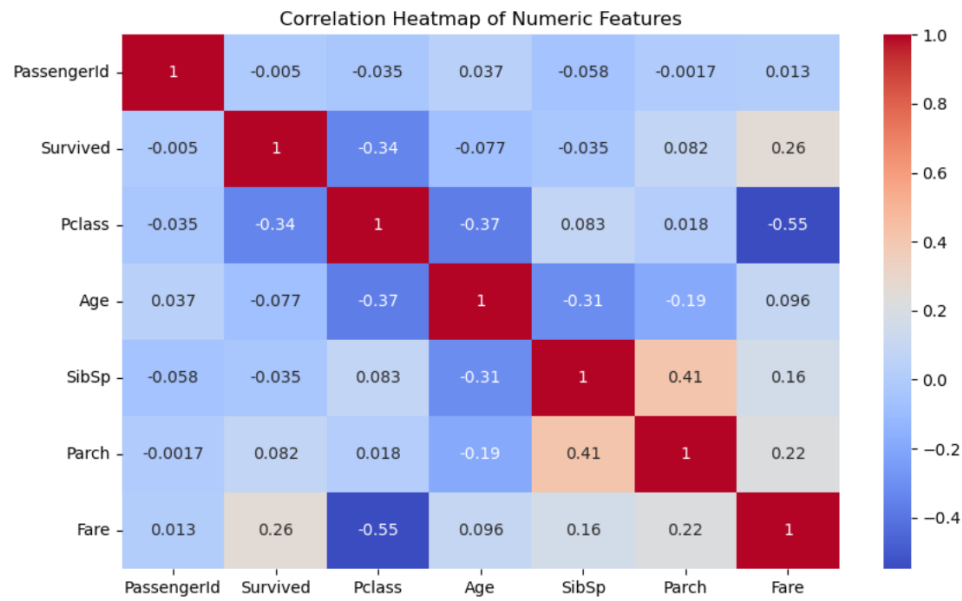
[23]:

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare	Cabin	Embarked
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```
[31]: plt.figure(figsize=(10, 6))
sns.heatmap(df.select_dtypes(include='number').corr(), annot=True, cmap='coolwarm')
plt.title("Correlation Heatmap of Numeric Features")
plt.show()
df
```



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