import.csv.py

```python
# Importing necessary libraries
import pandas as pd# Load the downloaded Titanic dataset
file_path = 'Titanic.csv'
titanic_data = pd.read_csv('C:\Users\vikra\OneDrive\Desktop')
# Show the first few rows of the dataset to get an overview
titanic_data.head()
```

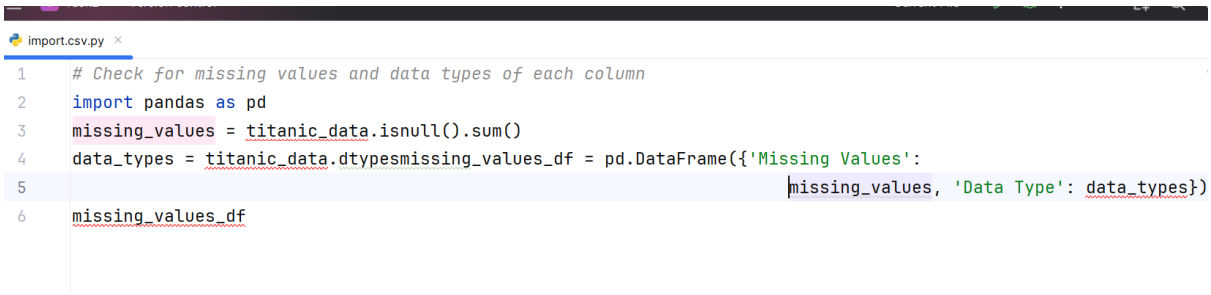
OUTPUT

PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare	Cabin	Embarked
1	0	3	Braund, Mr. Owen Harris	male	22.0	1	0	A/5 21171	7.2500	NaN	S
2	1	1	Cumings, Mrs. John Bradlefemale	38.0	1	0	PC 17599	71.2833	C85	C	
3	1	3	Heikkinen, Miss. Laina	female	26.0	0	0	STON/O2.3101282 7.9250	NaN	S	
4	1	1	Futrelle, Mrs. Jacques Heathfemale	35.0	1	0	113803	53.1000	C123	S	
5	0	3	Allen, Mr. William Henry	male	35.0	0	0	373450	8.0500	NaN	S

Data Exploration

The dataset contains the following columns:

1. **Sex**: Gender of the passenger (male/female)
2. **Age**: Age of the passenger
3. **SibSp**: Number of siblings/spouses aboard
4. **Parch**: Number of parents/children aboard
5. **Fare**: Ticket fare
6. **Embarked**: Port of embarkation (C = Cherbourg; Q = Queenstown; S = Southampton)
7. **Pclass**: Ticket class (First, Second, Third)
8. Cabin: cabin number
9. **Survived**: Whether the passenger survived (1) or not (0)



OUTPUT:

Missing	Values	Data Type
PassengerId	0	int64
Survived	0	int64
Pclass	0	int64
Name	0	object
Sex	0	object
Age	177	float64
SibSp	0	int64
Parch	0	int64
Ticket	0	object
Fare	0	float64
Cabin	687	object
Embarked	2	object

Data Cleaning

We have the following issues in the dataset:

1. **age**: 177 missing values
2. **embarked**: 2 missing values

To handle these:

- For the **age** column, we can fill the missing values with the median age.
- For the **embarked** column, we can fill the missing values with the most frequent port of embarkation.

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```python
# Fill missing values in the 'age' column with the median age
median_age = titanic_data['Age'].median()
titanic_data['Age'].fillna(median_age, inplace=True)
# Fill missing values in the 'embarked' column with the most frequent value
most_frequent_embarked = titanic_data['Embarked'].mode()[0]
titanic_data['Embarked'].fillna(most_frequent_embarked, inplace=True)
# Verify that there are no more missing values
titanic_data.isnull().sum()

```

OUTPUT:

PassengerId	0
Survived	0
Pclass	0
Name	0
Sex	0
Age	0
SibSp	0
Parch	0
Ticket	0
Fare	0
Cabin	687
Embarked	0

Data Cleaning Summary

All missing values have been successfully addressed:

- The **age** column's missing values have been filled with the median age.
- The **embarked** column's missing values have been filled with the most frequent port of embarkation.

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```python
# Calculate basic statistical measures for the numerical columns
statistical_summary = titanic_data.describe()

statistical_summary
```

OUTPUT:

	Age	SibSp	Parch	Fare	Survived
count	891.000000	891.000000	891.000000	891.000000	891.000000
mean	29.361582	0.523008	0.381594	32.204208	0.383838
std	13.019697	1.102743	0.806057	49.693429	0.486592
min	0.420000	0.000000	0.000000	0.000000	0.000000
25%	22.000000	0.000000	0.000000	7.910400	0.000000
50%	28.000000	0.000000	0.000000	14.454200	0.000000
75%	35.000000	1.000000	0.000000	31.000000	1.000000
max	80.000000	8.000000	6.000000	512.329200	1.000000

Data Analysis

Let's now proceed with some basic statistical analysis to summarize the dataset.

Data Analysis Summary

Here are some key statistical insights about the numerical columns:

1. **Age**: The average age of passengers is approximately 29.36 years, with a standard deviation of 13.02. The youngest passenger was 0.42 years old, and the oldest was 80.
2. **SibSp (Siblings/Spouses)**: On average, passengers had about 0.52 siblings or spouses aboard. The maximum number in this category is 8.
3. **Parch (Parents/Children)**: On average, passengers had about 0.38 parents or children aboard. The maximum number in this category is 6.
4. **Fare**: The average ticket fare was approximately 32.20 units, with a wide standard deviation of 49.69. The fare ranged from 0 to 512.33 units.
5. **Survived**: About 38.4% of the passengers in this dataset survived.

Data Visualization

- Distribution of numerical features
- Categorical features vs Survival rate
- Correlations between features

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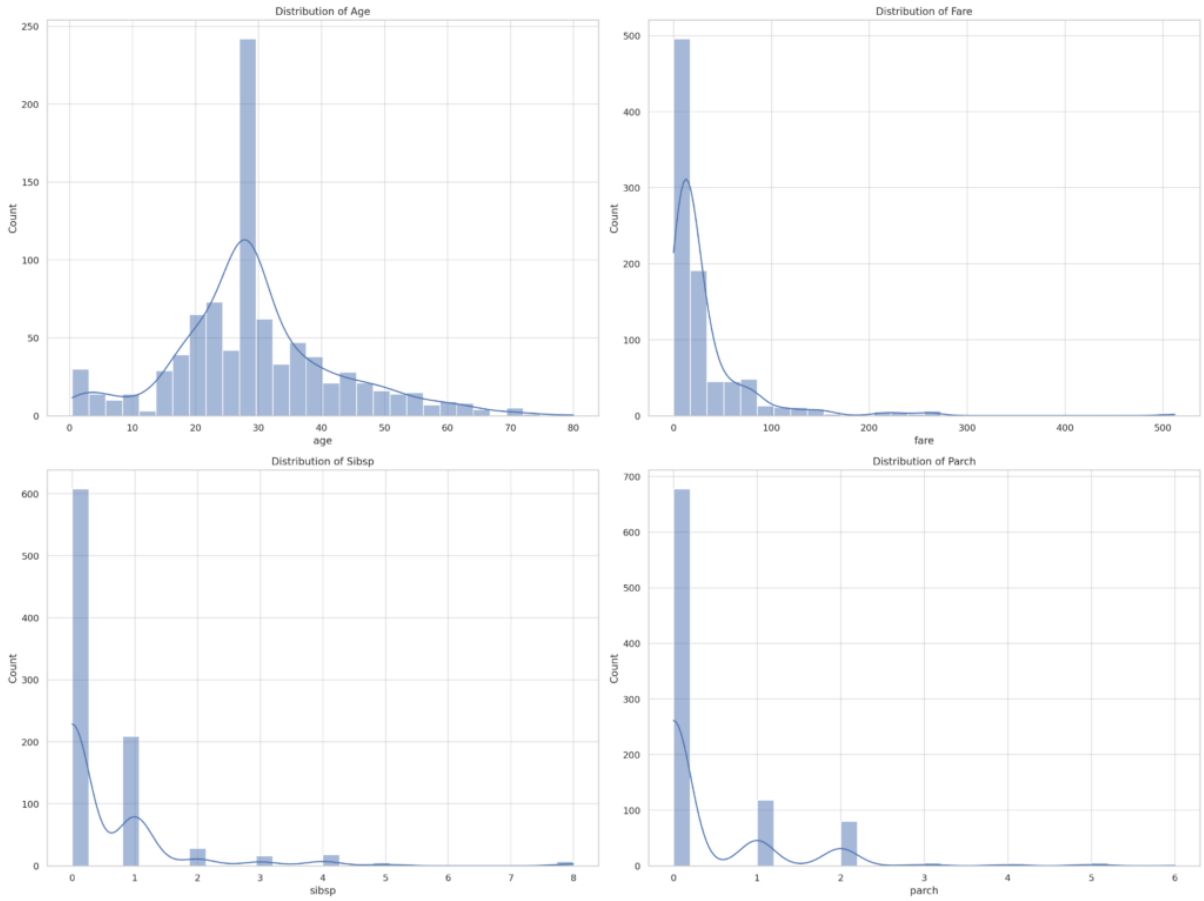
```python
# Importing necessary libraries for data visualization
import matplotlib.pyplot as plt
import seaborn as sns# Set the style for the visualizations
sns.set(style="whitegrid")
# Initialize the figure
plt.figure(figsize=(20, 15))
# Create a list of numerical features
numerical_features = ['Age', 'Fare', 'SibSp', 'Parch']
# Create subplots for each numerical feature
for i, feature in enumerate(numerical_features, 1):
plt.subplot( *args: 2, 2, i)
sns.histplot(titanic_data[feature], bins=30, kde=True)
plt.title(f'Distribution of {feature.capitalize()}')plt.tight_layout()
plt.show()

```

OUTPUT:



Data Visualization Summary: Numerical Features

1. **Age**: The age distribution is somewhat skewed to the right, with a higher concentration of passengers between 20 and 30 years old.
2. **Fare**: The fare distribution is highly skewed to the right, indicating that most passengers paid a lower fare, while a few paid extremely high fares.
3. **SibSp (Siblings/Spouses)**: Most passengers did not have siblings or spouses aboard, as indicated by the peak at 0.
4. **Parch (Parents/Children)**: Similar to SibSp, most passengers did not have parents or children aboard.

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```
# Initialize the figure
plt.figure(figsize=(20, 15))
# Create a list of categorical features related to survival
categorical_features = ['Sex', 'Class', 'Embarked']
# Create subplots for each categorical feature vs survival
for i, feature in enumerate(categorical_features, 1):
plt.subplot(2, 3, i)
sns.barplot(x=feature, y='survived', data=titanic_data)
plt.title(f'Survival Rate by {feature.capitalize()}')plt.tight_layout()
plt.show()
```