Exploratory Data Analysis (EDA): Feature Distributions

```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

```
df=pd.read_csv("/content/titanic_toy.csv")
```

```
df.sample(5)
```

	Age	Fare	Family	Survived
661	40.0	7.225	0	0
366	60.0	75.250	1	1
407	3.0	18.750	2	1
288	42.0	13.000	0	1
56	21.0	10.500	0	1

```
df.drop(columns=['Family'],inplace=True)
```

```
plt.figure(figsize=(14,4))
plt.subplot(121)
sns.distplot(df['Age'])

plt.subplot(122)
sns.distplot(df['Fare'])
plt.show()
```

```
/tmp/ipython-input-1742348073.py:3: UserWarning:

`distplot` is a deprecated function and will be removed in seaborn v0.14.0.

Please adapt your code to use either `displot` (a figure-level function with
similar flexibility) or `histplot` (an axes-level function for histograms).

For a guide to updating your code to use the new functions, please see
https://gist.github.com/mwaskom/de44147ed2974457ad6372750bbe5751

  sns.distplot(df['Age'])
/tmp/ipython-input-1742348073.py:6: UserWarning:

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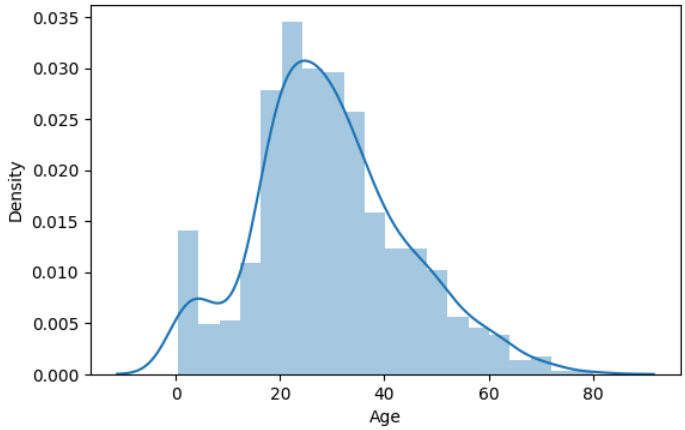
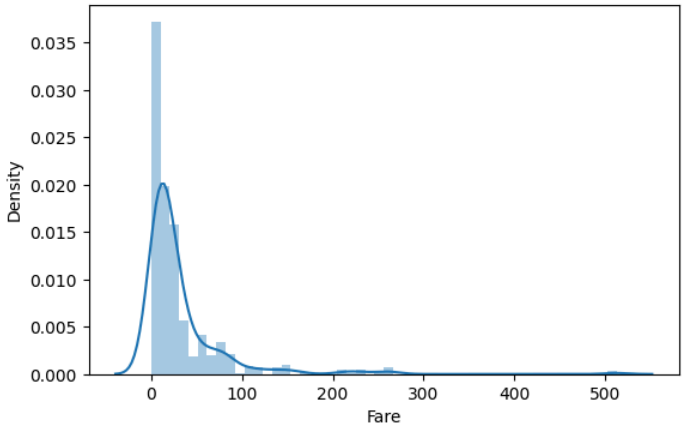
  sns.distplot(df['Fare'])
```





Statistical Summary & Outlier Detection

```
print("mean value of Age",df['Age'].mean())
print("std value of Age",df['Age'].std())
print("min value of Age",df['Age'].min())
print("max value of Age",df['Age'].max())
```

```
mean value of Age 29.69911764705882
std value of Age 14.526497332334044
min value of Age 0.42
max value of Age 80.0
```

```
print("Highest Allowed",df['Fare'].mean() + 3 * df['Fare'].std())
print("lowest Allowed",df['Fare'].mean() - 3 * df['Fare'].std())
```

```
Highest Allowed 183.19672527531617
lowest Allowed -118.63804867957151
```

```
df[(df['Fare']>183.19) | (df['Fare']< 0)]
```

	Age	Fare	Survived
27	19.0	263.0000	0
88	23.0	263.0000	1
118	24.0	247.5208	0
258	35.0	512.3292	1
299	50.0	247.5208	1
311	18.0	262.3750	1
341	24.0	263.0000	1
377	27.0	211.5000	0
380	42.0	227.5250	1
438	64.0	263.0000	0
527	NaN	221.7792	0
557	NaN	227.5250	0
679	36.0	512.3292	1
689	15.0	211.3375	1
700	18.0	227.5250	1
716	38.0	227.5250	1
730	29.0	211.3375	1
737	35.0	512.3292	1
742	21.0	262.3750	1
779	43.0	211.3375	1

✂️ Outlier Removal (Fare Feature)

```
new_df=df[(df['Fare']<183.19) | (df['Fare']> 0)]
```

📏 Outlier Detection & Removal (Z-Score Method)

```
df['Fare_zscore']=(df['Fare']-df['Fare'].mean())/df['Fare'].std()
```

```
df.sample(5)
```

	Age	Fare	Survived	Fare_zscore
67	19.0	8.1583	0	-0.479488
432	42.0	26.0000	1	-0.124823
776	NaN	7.7500	0	-0.487605
621	42.0	52.5542	1	0.403032
769	32.0	8.3625	0	-0.475429

```
df[df['Fare_zscore']>3]
```

	Age	Fare	Survived	Fare_zscore
27	19.0	263.0000	0	4.586363
88	23.0	263.0000	1	4.586363
118	24.0	247.5208	0	4.278661
258	35.0	512.3292	1	9.542635
299	50.0	247.5208	1	4.278661
311	18.0	262.3750	1	4.573939
341	24.0	263.0000	1	4.586363
377	27.0	211.5000	0	3.562625
380	42.0	227.5250	1	3.881176
438	64.0	263.0000	0	4.586363
527	NaN	221.7792	0	3.766959
557	NaN	227.5250	0	3.881176
679	36.0	512.3292	1	9.542635
689	15.0	211.3375	1	3.559394
700	18.0	227.5250	1	3.881176
716	38.0	227.5250	1	3.881176
730	29.0	211.3375	1	3.559394
737	35.0	512.3292	1	9.542635
742	21.0	262.3750	1	4.573939
779	43.0	211.3375	1	3.559394

```
df[df['Fare_zscore']<-3]
```

Age	Fare	Survived	Fare_zscore

```
df[(df['Fare_zscore']>3)|(df['Fare_zscore']<-3)]
```

	Age	Fare	Survived	Fare_zscore
27	19.0	263.0000	0	4.586363
88	23.0	263.0000	1	4.586363
118	24.0	247.5208	0	4.278661
258	35.0	512.3292	1	9.542635
299	50.0	247.5208	1	4.278661
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341	24.0	263.0000	1	4.586363
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742	21.0	262.3750	1	4.573939
779	43.0	211.3375	1	3.559394

```
df['Fare'].shape
```

```
(891,)
```

```
new_df1['Fare'].shape
```

```
(846,)
```

```
new_df1=df[(df['Fare_zscore']<3)|(df['Fare_zscore']>-3)]
```

📌 Outlier Treatment (Capping)

```
upperlimit=df['Fare'].mean()+3*df['Fare'].std()
lowerlimit=df['Fare'].mean()-3*df['Fare'].std()
```

```
df['Fare']=np.where(
    df['Fare']>upperlimit,
    upperlimit,
    np.where(
        df['Fare']<lowerlimit,
        lowerlimit,
        df['Fare']
    )
)
```

```
sns.distplot(df['Fare'])
plt.show()
```

```
/tmp/ipython-input-1845787908.py:1: UserWarning:

`distplot` is a deprecated function and will be removed in seaborn v0.14.0.

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  sns.distplot(df['Fare'])
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