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

```
from google.colab import drive
drive.mount('/content/drive')
```

```
Mounted at /content/drive
```

```
train=pd.read_csv('/content/drive/MyDrive/InternShip/Titanic-Dataset.csv')
test=pd.read_csv('/content/drive/MyDrive/InternShip/test.csv')
```

```
print(train.shape)
print(test.shape)
```

```
(891, 12)
(418, 11)
```

```
test.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 418 entries, 0 to 417
Data columns (total 11 columns):
 #   Column       Non-Null Count  Dtype  
---  ------       --------------  -----  
 0   PassengerId  418 non-null    int64  
 1   Pclass       418 non-null    int64  
 2   Name         418 non-null    object 
 3   Sex          418 non-null    object 
 4   Age          332 non-null    float64
 5   SibSp        418 non-null    int64  
 6   Parch        418 non-null    int64  
 7   Ticket       418 non-null    object 
 8   Fare         417 non-null    float64
 9   Cabin        91 non-null     object 
 10  Embarked     418 non-null    object 
dtypes: float64(2), int64(4), object(5)
memory usage: 36.0+ KB
```

```
train.drop(columns=['Cabin'],inplace=True)
test.drop(columns=['Cabin'],inplace=True)
```

```
train['Embarked'].fillna('S',inplace=True)
```

```
<ipython-input-7-6702a28d6ea0>:1: FutureWarning: A value is trying to be set on a copy of a DataFrame or Series through chained assi
The behavior will change in pandas 3.0. This inplace method will never work because the intermediate object on which we are setting

For example, when doing 'df[col].method(value, inplace=True)', try using 'df.method({col: value}, inplace=True)' or df[col] = df[col

  train['Embarked'].fillna('S',inplace=True)
```

```
test['Fare'].fillna(test['Fare'].mean(), inplace=True)
```

```
<ipython-input-8-f2bd6e3cf28a>:1: FutureWarning: A value is trying to be set on a copy of a DataFrame or Series through chained assi
The behavior will change in pandas 3.0. This inplace method will never work because the intermediate object on which we are setting

For example, when doing 'df[col].method(value, inplace=True)', try using 'df.method({col: value}, inplace=True)' or df[col] = df[col

  test['Fare'].fillna(test['Fare'].mean(), inplace=True)
```

```
train.isnull().sum()
```

	0
PassengerId	0
Survived	0
Pclass	0
Name	0
Sex	0
Age	177
SibSp	0
Parch	0
Ticket	0
Fare	0
Embarked	0

dtype: int64

```
gen_age=np.random.randint(train['Age'].mean()-train['Age'].std(),train['Age'].mean()+train['Age'].std(), size=177)
```

```
train['Age'][np.isnan(train['Age'])]=gen_age
```

```
<ipython-input-11-2ce148eb0d56>:1: FutureWarning: ChainedAssignmentError: behaviour will change in pandas 3.0!
You are setting values through chained assignment. Currently this works in certain cases, but when using Copy-on-Write (which will b
A typical example is when you are setting values in a column of a DataFrame, like:

df["col"][row_indexer] = value

Use `df.loc[row_indexer, "col"] = values` instead, to perform the assignment in a single step and ensure this keeps updating the ori

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus

  train['Age'][np.isnan(train['Age'])]=gen_age
<ipython-input-11-2ce148eb0d56>:1: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus
  train['Age'][np.isnan(train['Age'])]=gen_age
```

```
train.isnull().sum()
```

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

dtype: int64

```
gen_age1=np.random.randint(test['Age'].mean()-test['Age'].std(),test['Age'].mean()+test['Age'].std(), size=86)
```

```
test['Age'][np.isnan(test['Age'])]=gen_age1
```

```
<ipython-input-14-0b74930e6951>:1: FutureWarning: ChainedAssignmentError: behaviour will change in pandas 3.0!
You are setting values through chained assignment. Currently this works in certain cases, but when using Copy-on-Write (which will b
A typical example is when you are setting values in a column of a DataFrame, like:

df["col"][row_indexer] = value

Use `df.loc[row_indexer, "col"] = values` instead, to perform the assignment in a single step and ensure this keeps updating the ori
```

```
See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus

  test['Age'][np.isnan(test['Age'])]=gen_age1
<ipython-input-14-0b74930e6951>:1: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus
  test['Age'][np.isnan(test['Age'])]=gen_age1
```

```
test.isnull().sum()
```

	0
PassengerId	0
Pclass	0
Name	0
Sex	0
Age	0
SibSp	0
Parch	0
Ticket	0
Fare	0
Embarked	0

dtype: int64

```
train.isnull().sum()
```

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

dtype: int64

```
train[['Pclass','Survived']].groupby('Pclass').mean()
```

Pclass	Survived
1	0.629630
2	0.472826
3	0.242363

```
train[['Sex','Survived']].groupby('Sex').mean()
```

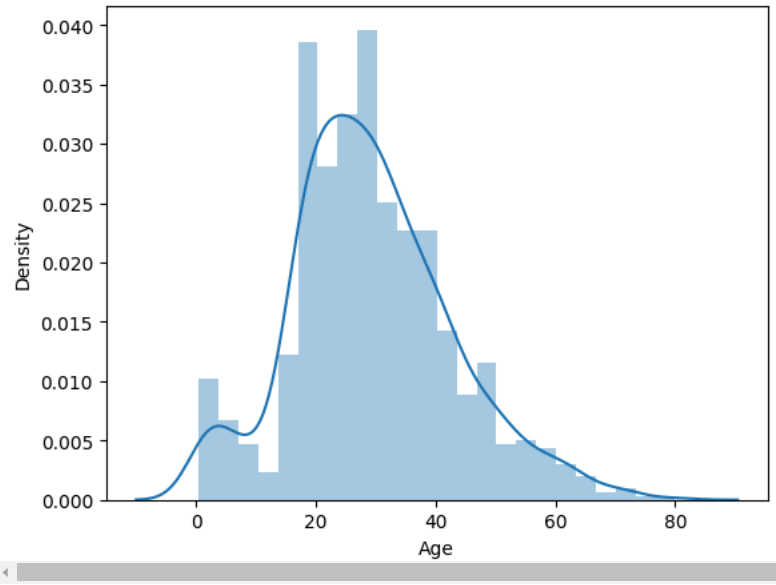
Sex	Survived
female	0.742038
male	0.188908

```
train[['Embarked','Survived']].groupby('Embarked').mean()
```

Embarked	Survived
C	0.553571
Q	0.389610
S	0.339009

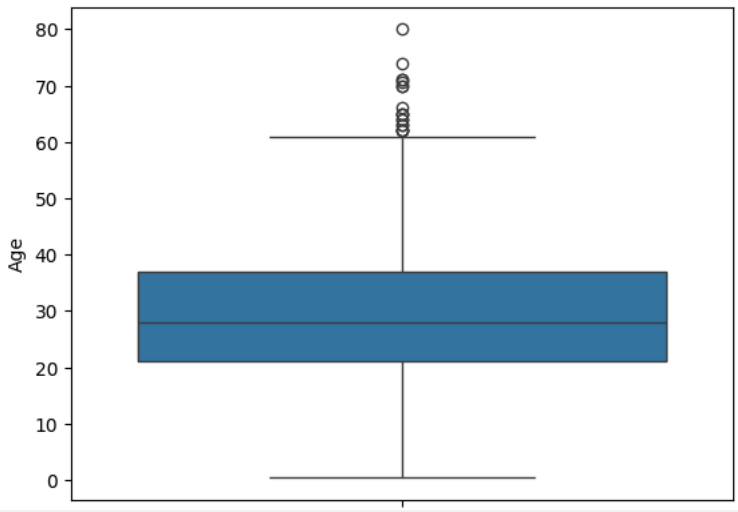
```
sns.distplot(train['Age'])
```

```
<ipython-input-20-22ed6932e5e8>:1: 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(train['Age'])
<Axes: xlabel='Age', ylabel='Density'>
```




```
sns.boxplot(train['Age'])
```

```
<Axes: ylabel='Age'>
```



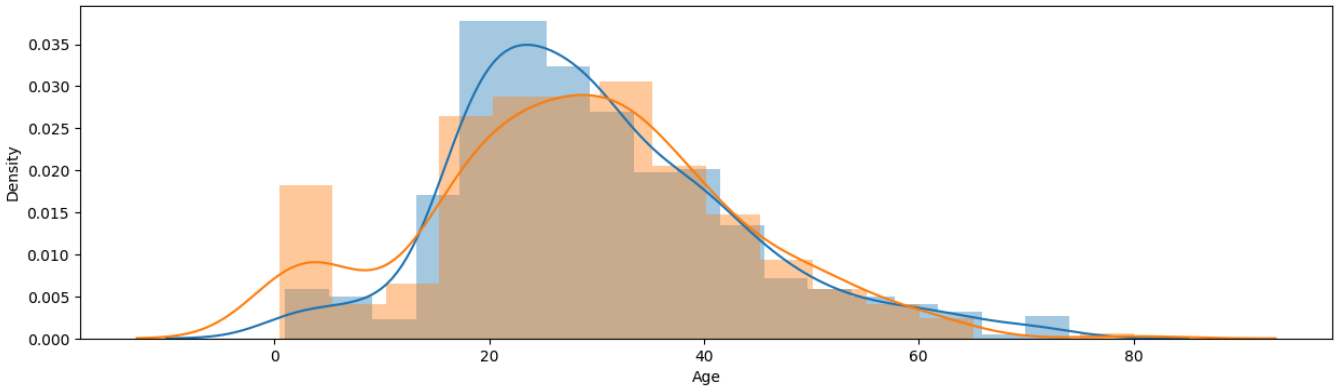

```
train[train['Age']>75]['Survived'].value_counts()
```

Survived	count
1	1

dtype: int64

```
plt.subplots(figsize=(15,4))
sns.distplot(train[train['Survived']==0]['Age'])
sns.distplot(train[train['Survived']==1]['Age'])
```

```
<ipython-input-23-8cacb70f70fe>:2: 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(train[train['Survived']==0]['Age'])
<ipython-input-23-8cacb70f70fe>: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(train[train['Survived']==1]['Age'])
<Axes: xlabel='Age', ylabel='Density'>
```




```
passengerId=test['PassengerId'].values
```

```
train.drop(columns=['PassengerId','Ticket'],inplace=True)
test.drop(columns=['PassengerId','Ticket'],inplace=True)
```

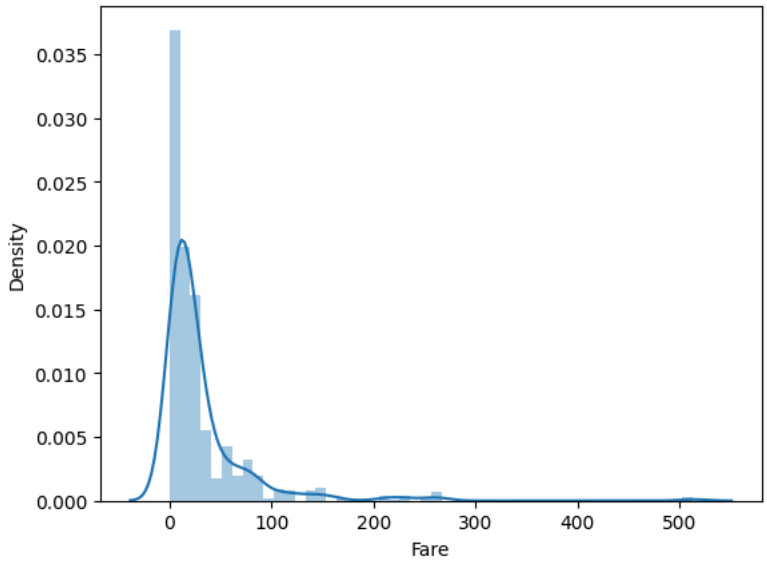
```
train.isnull().sum()
```

	0
Survived	0
Pclass	0
Name	0
Sex	0
Age	0
SibSp	0
Parch	0
Fare	0
Embarked	0

dtype: int64

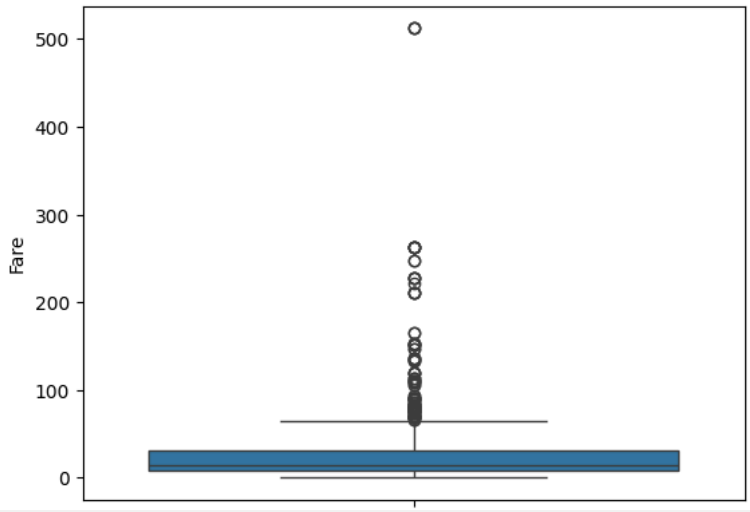
```
sns.distplot(train['Fare'])
```

```
<ipython-input-27-98b78f01c2eb>:1: 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(train['Fare'])
<Axes: xlabel='Fare', ylabel='Density'>
```




```
sns.boxplot(train['Fare'])
```

```
<Axes: ylabel='Fare'>
```



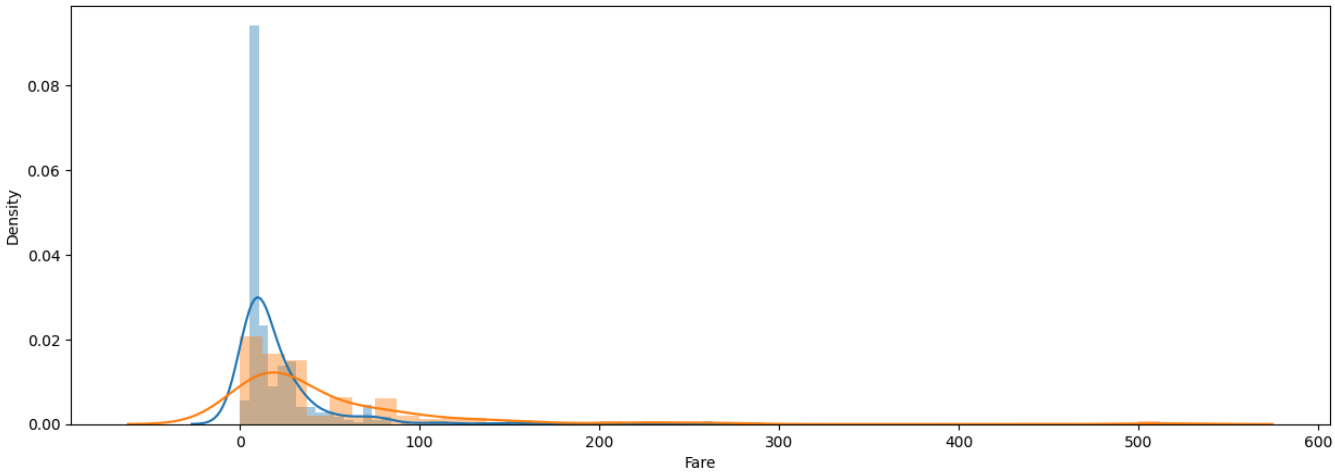

```
train[train['Fare']>400]['Survived'].value_counts()
```

Survived	count
1	3

dtype: int64

```
plt.subplots(figsize=(15,5))
sns.distplot(train[train['Survived']==0]['Fare'])
sns.distplot(train[train['Survived']==1]['Fare'])
```

```
<ipython-input-30-130bed88962b>:2: 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(train[train['Survived']==0]['Fare'])
<ipython-input-30-130bed88962b>: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(train[train['Survived']==1]['Fare'])
<Axes: xlabel='Fare', ylabel='Density'>
```




```
# Don't delete this unless its 1st Jan
train['Name']
```

	Name
0	Braund, Mr. Owen Harris
1	Cumings, Mrs. John Bradley (Florence Briggs Th...
2	Heikkinen, Miss. Laina
3	Futrelle, Mrs. Jacques Heath (Lily May Peel)
4	Allen, Mr. William Henry
...	...
886	Montvila, Rev. Juozas
887	Graham, Miss. Margaret Edith
888	Johnston, Miss. Catherine Helen "Carrie"
889	Behr, Mr. Karl Howell
890	Dooley, Mr. Patrick

891 rows × 1 columns

dtype: object

```
train.drop(columns=['Name'],inplace=True)
test.drop(columns=['Name'],inplace=True)


train['family']=train['SibSp'] + train['Parch'] + 1
test['family']=test['SibSp'] + test['Parch'] + 1
```

```
train.drop(columns=['SibSp','Parch'],inplace=True)
test.drop(columns=['SibSp','Parch'],inplace=True)
```

```
train['family'].value_counts()
```

family	count
1	537
2	161
3	102
4	29
6	22
5	15
7	12
11	7
8	6

dtype: int64

```
train[['family','Survived']].groupby('family').mean()
```

family	Survived
1	0.303538
2	0.552795
3	0.578431
4	0.724138
5	0.200000
6	0.136364
7	0.333333
8	0.000000
11	0.000000

```
def family_size(number):
    if number==1:
        return "Alone"
    elif number>1 and number <5:
        return "Small"
    else:
        return "Large"
```

```
family_size(5)
```

```
'Large'
```

```
train['family_size']=train['family'].apply(family_size)
```

```
test['family_size']=test['family'].apply(family_size)
```

```
train.drop(columns=['family'],inplace=True)
test.drop(columns=['family'],inplace=True)
```

```
y=train['Survived'].values
y
```

```
array([0, 1, 1, 1, 0, 0, 0, 0, 1, 1, 1, 1, 0, 0, 0, 1, 0, 1, 0, 1, 0, 1,
       1, 1, 0, 1, 0, 0, 1, 0, 0, 1, 1, 0, 0, 0, 1, 0, 0, 1, 0, 0, 0, 1,
       1, 0, 0, 1, 0, 0, 0, 0, 0, 1, 1, 0, 1, 1, 0, 1, 0, 0, 1, 0, 0, 1,
       1, 0, 1, 0, 0, 0, 0, 0, 1, 0, 0, 0, 1, 1, 0, 1, 1, 0, 1, 1, 0, 0,
       1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 1, 0, 0, 0, 0, 0, 0, 0, 1, 1, 0, 1,
       0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 1, 0, 1, 1, 0, 0, 0,
       0, 1, 0, 0, 1, 0, 0, 0, 0, 1, 1, 0, 0, 0, 1, 0, 0, 0, 0, 1, 0, 0,
       0, 0, 1, 0, 0, 0, 0, 1, 0, 0, 0, 1, 1, 0, 0, 0, 0, 0, 1, 0, 0, 0,
```

```
       0, 0, 0, 0, 0, 0, 0, 1, 1, 0, 1, 1, 0, 0, 1, 0, 1, 1, 1, 1, 0, 0,
       1, 0, 0, 0, 0, 0, 1, 0, 0, 1, 1, 1, 0, 1, 0, 0, 0, 1, 1, 0, 1, 0,
       1, 0, 0, 0, 1, 0, 1, 0, 0, 0, 1, 0, 0, 1, 0, 0, 0, 1, 0, 0, 0, 1,
       0, 0, 0, 0, 0, 1, 1, 0, 0, 0, 0, 0, 0, 1, 1, 1, 1, 1, 0, 1, 0, 0,
       0, 0, 0, 1, 1, 1, 0, 1, 1, 0, 1, 1, 0, 0, 0, 1, 0, 0, 0, 1, 0, 0,
       1, 0, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 1, 1, 1, 1, 0, 1, 0, 1, 1, 1,
       0, 1, 1, 1, 0, 0, 0, 1, 1, 0, 1, 1, 0, 0, 1, 1, 0, 1, 0, 1, 1, 1,
       1, 0, 0, 0, 1, 0, 0, 1, 1, 0, 1, 1, 0, 0, 0, 1, 1, 1, 1, 0, 0, 0,
       0, 0, 0, 0, 1, 0, 1, 1, 0, 0, 0, 0, 0, 0, 1, 1, 1, 1, 1, 0, 0, 0,
       0, 1, 1, 0, 0, 0, 1, 1, 0, 1, 0, 0, 0, 1, 0, 1, 1, 1, 0, 1, 1, 0,
       0, 0, 0, 1, 1, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 1, 0, 1, 0, 1, 1,
       0, 0, 0, 0, 0, 0, 0, 0, 1, 1, 0, 1, 1, 1, 1, 0, 0, 1, 0, 1, 0, 0,
       1, 0, 0, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 1, 0, 1, 0, 1, 1, 0, 1, 0,
       0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 1, 1, 0, 0, 0, 0, 0, 1, 0, 0, 0, 1,
       1, 0, 1, 0, 0, 1, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 1, 0,
       1, 1, 0, 1, 1, 0, 1, 1, 0, 0, 1, 0, 1, 0, 1, 0, 0, 1, 0, 0, 1, 0,
       0, 0, 1, 0, 0, 1, 0, 1, 0, 1, 0, 1, 1, 0, 0, 1, 0, 0, 1, 1, 0, 1,
       1, 0, 0, 1, 1, 0, 1, 0, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 1, 1, 1, 1,
       1, 1, 0, 0, 1, 1, 0, 1, 1, 1, 0, 0, 0, 1, 0, 1, 0, 0, 0, 1, 0, 0,
       0, 0, 1, 0, 0, 1, 1, 0, 0, 0, 1, 0, 0, 1, 1, 1, 0, 0, 1, 0, 0, 1,
       0, 0, 1, 0, 0, 1, 1, 0, 0, 0, 0, 1, 0, 0, 1, 0, 1, 0, 0, 1, 0, 0,
       0, 0, 0, 1, 0, 1, 1, 1, 0, 1, 0, 1, 0, 1, 0, 1, 0, 0, 0, 0, 0, 0,
       1, 0, 0, 0, 1, 0, 0, 0, 0, 1, 1, 0, 0, 1, 0, 0, 0, 1, 0, 1, 0, 1,
       0, 0, 0, 0, 0, 0, 0, 1, 1, 1, 1, 0, 0, 0, 0, 1, 0, 0, 1, 1, 0, 0,
       0, 0, 1, 1, 1, 1, 1, 0, 1, 0, 0, 0, 1, 1, 0, 0, 1, 0, 0, 0, 1, 0,
       1, 1, 0, 0, 1, 0, 0, 0, 0, 0, 0, 1, 0, 0, 1, 0, 1, 0, 1, 0, 0, 1,
       0, 0, 1, 1, 0, 0, 1, 1, 0, 0, 0, 1, 0, 0, 1, 1, 0, 1, 0, 0, 0, 0,
       0, 0, 0, 0, 1, 0, 0, 1, 0, 1, 1, 1, 0, 0, 0, 0, 1, 0, 1, 0, 0, 0,
       0, 0, 0, 0, 1, 1, 0, 0, 0, 1, 1, 1, 1, 0, 0, 0, 0, 1, 0, 0, 0, 0,
       0, 0, 0, 0, 0, 0, 1, 1, 0, 1, 0, 0, 0, 1, 1, 1, 1, 1, 0, 0, 0, 1,
       0, 0, 1, 1, 0, 0, 1, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 1, 0, 1, 1, 1,
       1, 0, 0, 0, 1, 0, 0, 1, 1, 0, 0, 1, 0, 1, 0, 0, 1, 1, 0, 0, 0, 1,
       1, 0, 0, 0, 0, 0, 0, 1, 0, 1, 0]
```

```
train.drop(columns=['Survived'],inplace=True)
```

```
print(train.shape)
print(test.shape)
```

```
(891, 6)
(418, 6)
```

```
final = pd.concat([train, test], ignore_index=True)
```

```
final.shape
```

```
(1309, 6)
```

```
final=pd.get_dummies(final, columns=['Pclass','Sex','Embarked','family_size'], drop_first=True)
```

```
Xf=final.tail(418).values
```

```
X=final.head(891).values
```

```
X.shape
```

```
(891, 9)
```

```
y.shape
```

```
(891,)
```

```
from sklearn.model_selection import train_test_split
X_train, X_test, y_train, y_test=train_test_split(X,y,test_size=0.2)
```

```
from sklearn.tree import DecisionTreeClassifier
clf=DecisionTreeClassifier()
```

```
clf.fit(X_train,y_train)
```

```
▾ DecisionTreeClassifier ⓘ ?
DecisionTreeClassifier()
```

```
y_pred=clf.predict(X_test)
```

```
y_pred.shape
```

```
(179,)
```

```
y_test.shape
```

```
(179,)
```

```
from sklearn.metrics import accuracy_score
accuracy_score(y_test,y_pred)
```

```
0.8100558659217877
```

```
yf=clf.predict(Xf)
```

```
yf.shape
```

```
(418,)
```

```
submission=pd.DataFrame()
```

```
submission['PassengerId']=passengerId
submission['Survived']=yf
```

```
submission.to_csv('submission.csv', index=False)
```

```
from google.colab import files
```