TITANIC SURVIVAL PREDICTION

In [182…

```
# import imprtant libraries
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
%matplotlib inline
sns.set_style("whitegrid")
```

In [183…

```
# Load the given Data set
titanic_df = pd.read_csv("./tested.csv")
```

In [184…

```
#Show top five rows of the data sets
titanic_df.head()
```

Out[184]:

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare	Cabin	Embarked
0	892	0	3	Kelly, Mr. James	male	34.5	0	0	330911	7.8292	NaN	Q
1	893	1	3	Wilkes, Mrs. James (Ellen Needs)	female	47.0	1	0	363272	7.0000	NaN	S
2	894	0	2	Myles, Mr. Thomas Francis	male	62.0	0	0	240276	9.6875	NaN	Q
3	895	0	3	Wirz, Mr. Albert	male	27.0	0	0	315154	8.6625	NaN	S
4	896	1	3	Hirvonen, Mrs. Alexander (Helga E Lindqvist)	female	22.0	1	1	3101298	12.2875	NaN	S

In [185…

```
# Show five rows from the tail
titanic_df.tail()
```

Out[185]:

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare	Cabin	En
413	1305	0	3	Spector, Mr. Woolf	male	NaN	0	0	A.5. 3236	8.0500	NaN	
414	1306	1	1	Oliva y Ocana, Dona. Fermina	female	39.0	0	0	PC 17758	108.9000	C105	
415	1307	0	3	Saether, Mr. Simon Sivertsen	male	38.5	0	0	SOTON/O.Q. 3101262	7.2500	NaN	
416	1308	0	3	Ware, Mr. Frederick	male	NaN	0	0	359309	8.0500	NaN	
417	1309	0	3	Peter, Master. Michael J	male	NaN	1	1	2668	22.3583	NaN	

In [186…

```
# Cheking for null values
titanic_df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 418 entries, 0 to 417
Data columns (total 12 columns):
 #   Column       Non-Null Count  Dtype  
---  ------       --------------  -----  
 0   PassengerId  418 non-null    int64  
 1   Survived     418 non-null    int64  
 2   Pclass       418 non-null    int64  
 3   Name         418 non-null    object 
 4   Sex          418 non-null    object 
 5   Age          332 non-null    float64
 6   SibSp        418 non-null    int64  
 7   Parch        418 non-null    int64  
 8   Ticket       418 non-null    object 
 9   Fare         417 non-null    float64
 10  Cabin        91 non-null     object 
 11  Embarked     418 non-null    object 
dtypes: float64(2), int64(5), object(5)
memory usage: 39.3+ KB
```

In [187…

```
titanic_df.drop(["PassengerId","Ticket","Age"],axis=1,inplace=True)
```

In [188…

```
from sklearn.preprocessing import LabelEncoder

le = LabelEncoder()
titanic_df['Sex'] = le.fit_transform(titanic_df['Sex'])
titanic_df["Embarked"]=le.fit_transform(titanic_df["Embarked"])
```

In [189…

```
titanic_df[titanic_df["Fare"].isnull()]
```

Out[189]:

	Survived	Pclass	Name	Sex	SibSp	Parch	Fare	Cabin	Embarked
152	0	3	Storey, Mr. Thomas	1	0	0	NaN	NaN	2

In [190…

```
titanic_df.groupby('Pclass')["Fare"].mean()
```

Out[190]:

```
Pclass
1    94.280297
2    22.202104
3    12.459678
Name: Fare, dtype: float64
```

In [191…

```
# replace null values with mean of each column
titanic_df["Fare"].fillna(12.459678, inplace=True)
```

In [192…

```
# Null values in cabin columns

cabin_null_per = (titanic_df["Cabin"].isnull().sum())/(titanic_df["Embarked"].count()) *
print(f"Null value in Cabin column is:{round(cabin_null_per,2)}%")
```

```
Null value in Cabin column is:78.23%
```

In [193…

```
# from above we can see that Cabin column has 327 null values
# I drop the Cabin column
titanic_df = titanic_df.drop("Cabin", axis=1)
```

In [194…

```
titanic_df["Embarked"].value_counts()
```

Out[194]:

```
2    270
0    102
```

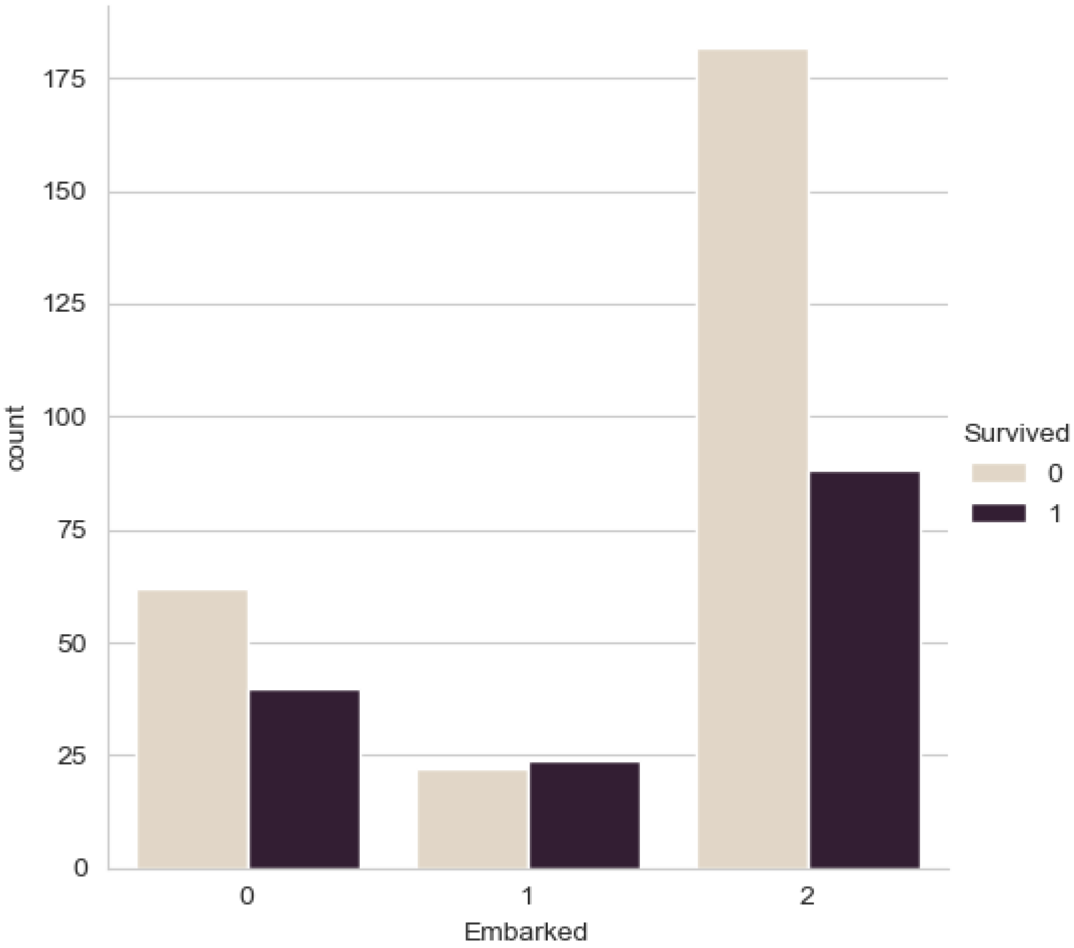
```
1     46
Name: Embarked, dtype: int64
```

In [195…

```
# sns.barplot(data=titanic_df, , hue='Survived')
sns.catplot(data=titanic_df, x='Embarked', kind="count", hue="Survived" ,palette="ch:.25
```

Out[195]:

```
<seaborn.axisgrid.FacetGrid at 0x197dae2bfa0>
```

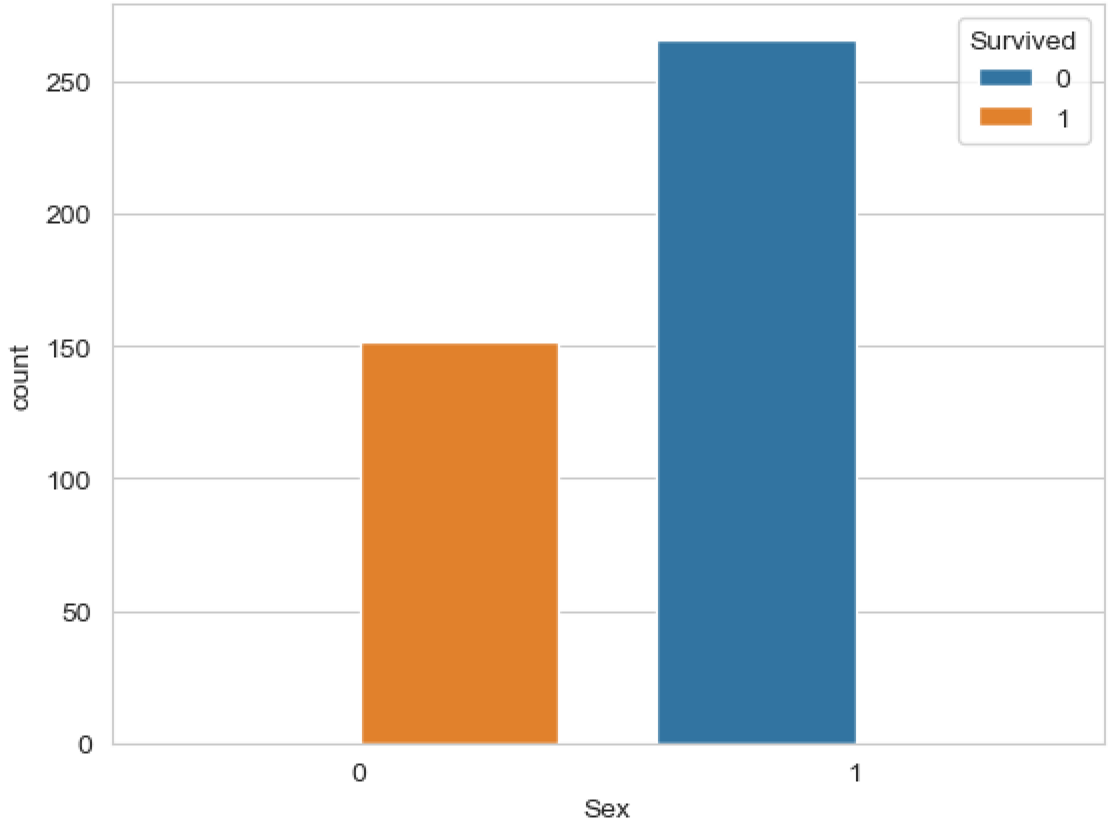


In [196…

```
sns.countplot(data=titanic_df,x="Sex", hue="Survived")
```

Out[196]:

```
<Axes: xlabel='Sex', ylabel='count'>
```



In [198…

```
X =titanic_df.drop(['Survived','Name'], axis=1)
y = titanic_df["Survived"]
```

In [199…

```
from sklearn.model_selection import train_test_split, cross_val_score
from sklearn.metrics import accuracy_score, classification_report
from sklearn.linear_model import LogisticRegression
from sklearn.tree import DecisionTreeClassifier
from sklearn.ensemble import RandomForestClassifier, AdaBoostClassifier
from sklearn.svm import SVC
import xgboost as xgb
from sklearn.preprocessing import StandardScaler
```

In [202…

```
def test_multiple_models(X, y, cv):
    # Split the data into training and testing sets
    X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_stat
    scaler = StandardScaler()
    X_train = scaler.fit_transform(X_train)
    X_test = scaler.transform(X_test)
    # Define the models to test
    models = [
        ("Logistic Regression", LogisticRegression()),
        ("Decision Tree", DecisionTreeClassifier()),
        ("Random Forest", RandomForestClassifier()),
        ("Support Vector Machine", SVC()),
        ("xgb",xgb.XGBClassifier(random_state=42)),
        ("AdaBoost",AdaBoostClassifier(n_estimators=100, random_state=42))

    ]

    # Iterate over each model
    for name, model in models:
        # Perform cross-validation
        scores = cross_val_score(model, X_train, y_train, cv=cv)

        # Train the model
        model.fit(X_train, y_train)
        # Make predictions on the test set
        y_pred = model.predict(X_test)

        # Evaluate the model
        accuracy = accuracy_score(y_test, y_pred)
        print(f"Model: {name}")
        print("Cross-Validation Accuracy:", scores.mean())
        print("Accuracy:", accuracy)

        report = classification_report(y_test, y_pred)
        print("Classification Report:\n", report)
        print("..."*40);
```

In [203…

```
test_multiple_models(X,y,5)
```

```
Model: Logistic Regression
Cross-Validation Accuracy: 1.0
Accuracy: 1.0
Classification Report:
               precision    recall  f1-score   support

           0       1.00      1.00      1.00        50
           1       1.00      1.00      1.00        34

    accuracy                           1.00        84
   macro avg       1.00      1.00      1.00        84
weighted avg       1.00      1.00      1.00        84

........................................................................................
Model: Decision Tree
Cross-Validation Accuracy: 1.0
Accuracy: 1.0
Classification Report:
               precision    recall  f1-score   support

           0       1.00      1.00      1.00        50
           1       1.00      1.00      1.00        34

    accuracy                           1.00        84
   macro avg       1.00      1.00      1.00        84
weighted avg       1.00      1.00      1.00        84

........................................................................................
Model: Random Forest
Cross-Validation Accuracy: 1.0
Accuracy: 1.0
Classification Report:
               precision    recall  f1-score   support

           0       1.00      1.00      1.00        50
           1       1.00      1.00      1.00        34

    accuracy                           1.00        84
   macro avg       1.00      1.00      1.00        84
weighted avg       1.00      1.00      1.00        84

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Model: Support Vector Machine
Cross-Validation Accuracy: 0.9879692446856625
Accuracy: 0.9880952380952381
Classification Report:
               precision    recall  f1-score   support

           0       0.98      1.00      0.99        50
           1       1.00      0.97      0.99        34
    accuracy                           0.99        84
   macro avg       0.99      0.99      0.99        84
weighted avg       0.99      0.99      0.99        84

........................................................................................
Model: xgb
Cross-Validation Accuracy: 1.0
Accuracy: 1.0
Classification Report:
               precision    recall  f1-score   support

           0       1.00      1.00      1.00        50
           1       1.00      1.00      1.00        34

    accuracy                           1.00        84
   macro avg       1.00      1.00      1.00        84
weighted avg       1.00      1.00      1.00        84

........................................................................................
Model: AdaBoost
Cross-Validation Accuracy: 1.0
Accuracy: 1.0
Classification Report:
               precision    recall  f1-score   support

           0       1.00      1.00      1.00        50
           1       1.00      1.00      1.00        34

    accuracy                           1.00        84
   macro avg       1.00      1.00      1.00        84
weighted avg       1.00      1.00      1.00        84

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```

In [ ]: