```
import pandas as pd
import numpy as np

df_titanic_train = pd.read_csv('titanic_train.csv')
df_titanic_test = pd.read_csv('titanic_test.csv')

df_titanic_train.head()
```

```
   PassengerId  Survived  Pclass  \
0            1         0       3
1            2         1       1
2            3         1       3
3            4         1       1
4            5         0       3

                                                Name     Sex   Age
SibSp  \
0                            Braund, Mr. Owen Harris    male  22.0
1
1  Cumings, Mrs. John Bradley (Florence Briggs Th...  female  38.0
1
2                             Heikkinen, Miss. Laina  female  26.0
0
3       Futrelle, Mrs. Jacques Heath (Lily May Peel)  female  35.0
1
4                           Allen, Mr. William Henry    male  35.0
0

   Parch            Ticket     Fare Cabin Embarked
0      0         A/5 21171   7.2500   NaN        S
1      0          PC 17599  71.2833   C85        C
2      0  STON/O2. 3101282   7.9250   NaN        S
3      0            113803  53.1000  C123        S
4      0            373450   8.0500   NaN        S
```

```
df_titanic_train.isna().sum()
```

```
PassengerId      0
Survived         0
Pclass           0
Name             0
Sex              0
Age            177
SibSp            0
Parch            0
Ticket           0
Fare             0
Cabin          687
Embarked         2
dtype: int64
```

```
df_titanic_test.isna().sum()
```

```
PassengerId      0
Pclass           0
Name             0
Sex              0
Age             86
SibSp            0
Parch            0
Ticket           0
Fare             1
Cabin          327
Embarked         0
dtype: int64
```

```
df_titanic_train['CabinBooked']  =
df_titanic_train['Cabin'].apply(lambda x: 0 if pd.isna(x) else 1)
df_titanic_test['CabinBooked']  =
df_titanic_test['Cabin'].apply(lambda x: 0 if pd.isna(x) else 1)
```

```
df_titanic_train.drop(['PassengerId','Name','Ticket','Cabin'],axis=1,
inplace=True)
df_titanic_test.drop(['PassengerId','Name','Ticket','Cabin'],axis=1,
inplace=True)
```

```
df_titanic_train.head()
```

```
   Survived  Pclass     Sex   Age  SibSp  Parch     Fare Embarked
CabinBooked
0         0       3    male  22.0      1      0   7.2500        S
0
1         1       1  female  38.0      1      0  71.2833        C
1
2         1       3  female  26.0      0      0   7.9250        S
0
3         1       1  female  35.0      1      0  53.1000        S
1
4         0       3    male  35.0      0      0   8.0500        S
0
```

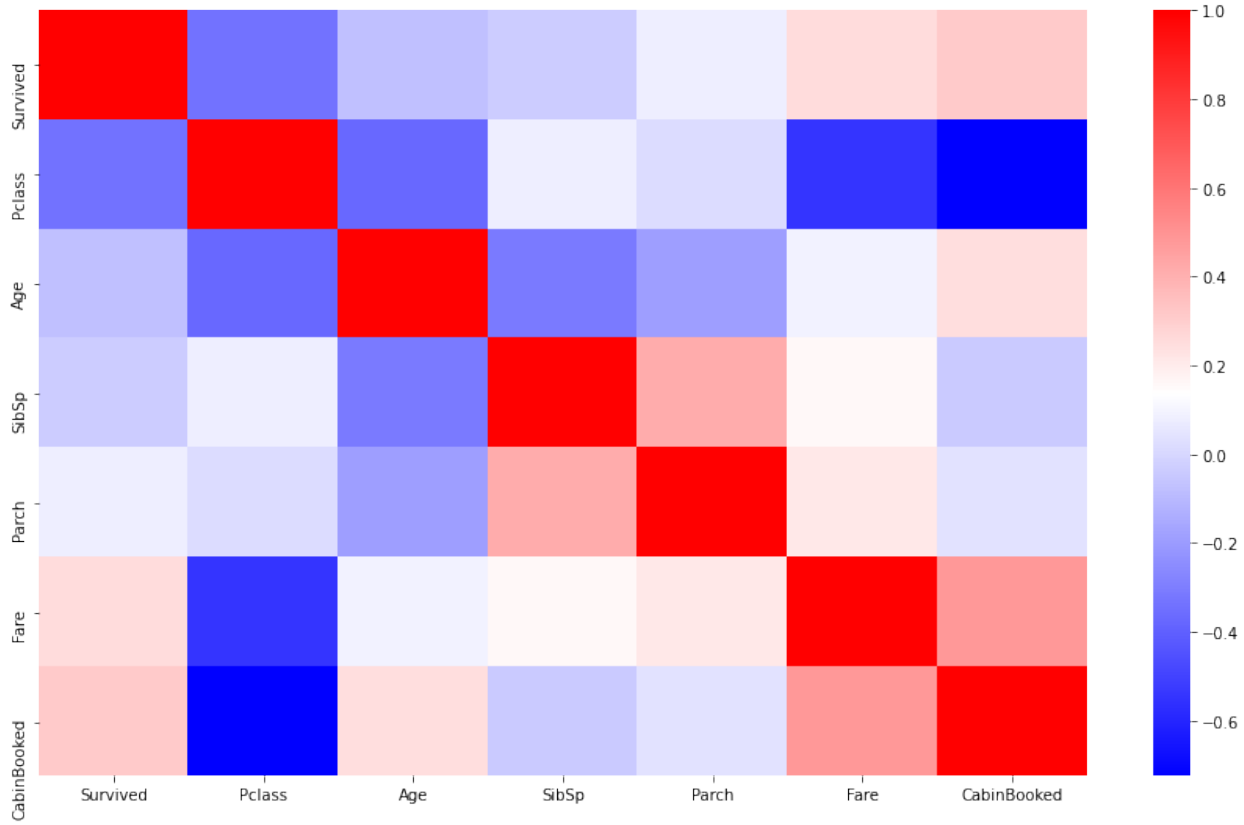
```
df_titanic_test.head()
```

```
   Pclass     Sex   Age  SibSp  Parch     Fare Embarked  CabinBooked
0       3    male  34.5      0      0   7.8292        Q            0
1       3  female  47.0      1      0   7.0000        S            0
2       2    male  62.0      0      0   9.6875        Q            0
3       3    male  27.0      0      0   8.6625        S            0
4       3  female  22.0      1      1  12.2875        S            0
```

```
df_titanic_train.Parch.value_counts()
```

```
0    678
1    118
2     80
5      5
3      5
4      4
6      1
Name: Parch, dtype: int64
```

```
import matplotlib.pyplot as plt
import seaborn as sns
plt.figure(figsize = (15,9))
sns.heatmap(df_titanic_train.corr(),cmap='bwr')
plt.show()
```




```
df_titanic_train['Embarked'].mode()
```

```
0    S
dtype: object
```

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

```
df_titanic_test.isna().sum()
```

```
Pclass          0
Sex             0
Age            86
SibSp           0
Parch           0
Fare            1
Embarked        0
CabinBooked     0
dtype: int64
```

```
df_titanic_train['Age'].fillna(df_titanic_train['Age'].median(),inplac
e=True)
df_titanic_test['Age'].fillna(df_titanic_train['Age'].median(),inplace
=True)

df_titanic_test['Fare'].fillna(df_titanic_train['Fare'].median(),inpla
ce=True)

df_titanic_train.head()
```

```
   Survived  Pclass     Sex   Age  SibSp  Parch     Fare Embarked
CabinBooked
0         0       3    male  22.0      1      0   7.2500        S
0
1         1       1  female  38.0      1      0  71.2833        C
1
2         1       3  female  26.0      0      0   7.9250        S
0
3         1       1  female  35.0      1      0  53.1000        S
1
4         0       3    male  35.0      0      0   8.0500        S
0
```

```
df_titanic_train = pd.get_dummies(df_titanic_train, columns =
['Sex','Embarked'],drop_first=True)
df_titanic_test = pd.get_dummies(df_titanic_test, columns =
['Sex','Embarked'],drop_first=True)

df_titanic_train.columns
```

```
Index(['Survived', 'Pclass', 'Age', 'SibSp', 'Parch', 'Fare',
'CabinBooked',
       'Sex_male', 'Embarked_Q', 'Embarked_S'],
      dtype='object')
```

```
df_titanic_test.columns

from sklearn.preprocessing import StandardScaler

scaler = StandardScaler()
df_titanic_train[['Age','Fare']] =
```

```
scaler.fit_transform(df_titanic_train[['Age','Fare']])
df_titanic_test[['Age','Fare']] =
scaler.transform(df_titanic_test[['Age','Fare']])

from sklearn.linear_model import LogisticRegression

model = LogisticRegression()

X_train = df_titanic_train.drop(['Survived'],axis=1)
y_train = df_titanic_train[['Survived']]

model.fit(X_train,y_train)

pred = model.predict(X_train)

from sklearn.metrics import confusion_matrix, accuracy_score,
precision_score, recall_score, roc_curve, RocCurveDisplay,auc

confusion_matrix(y_pred=pred, y_true=y_train)

accuracy_score(y_pred=pred, y_true=y_train)

(473+240)/(473+76+102+240)

tn, fp, fn, tp = confusion_matrix([0, 1, 0, 1], [1, 1, 1, 0]).ravel()

240/(240+76)

precision_score(y_pred=pred, y_true=y_train)

recall_score(y_pred=pred, y_true=y_train)

240/(240+102)

fpr, tpr, thresholds = roc_curve(y_score=pred, y_true=y_train)
roc_auc = auc(fpr, tpr)

print(roc_auc)

display = RocCurveDisplay(fpr=fpr, tpr=tpr, roc_auc=roc_auc,
estimator_name='example estimator')

display.plot()
```