```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
%matplotlib inline
train = pd.read_csv('/content/titanic.csv') # Training set is already available
train.head()
```

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare
0	1	0	3	Braund, Mr. Owen Harris	male	22.0	1	0	A/5 21171	7.250
1	2	1	1	Cumings, Mrs. John Bradley (Florence Briggs Th...	female	38.0	1	0	PC 17599	71.283
2	3	1	3	Heikkinen, Miss. Laina	female	26.0	0	0	STON/O2. 3101282	7.925
3	4	1	1	Futrelle, Mrs. Jacques Heath (Lily May Peel)	female	35.0	1	0	113803	53.100
4	5	0	3	Allen, Mr. William Henry	male	35.0	0	0	373450	8.050

Next steps: View recommended plots

```
train.info(verbose=True)
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 891 entries, 0 to 890
Data columns (total 12 columns):
 #   Column       Non-Null Count  Dtype
---  ------       --------------  -----
 0   PassengerId  891 non-null    int64
 1   Survived     891 non-null    int64
 2   Pclass       891 non-null    int64
 3   Name         891 non-null    object
 4   Sex          891 non-null    object
 5   Age          714 non-null    float64
```

```
 6   SibSp        891 non-null    int64
 7   Parch        891 non-null    int64
 8   Ticket       891 non-null    object
 9   Fare         891 non-null    float64
 10  Cabin        204 non-null    object
 11  Embarked     889 non-null    object
dtypes: float64(2), int64(5), object(5)
memory usage: 83.7+ KB
```

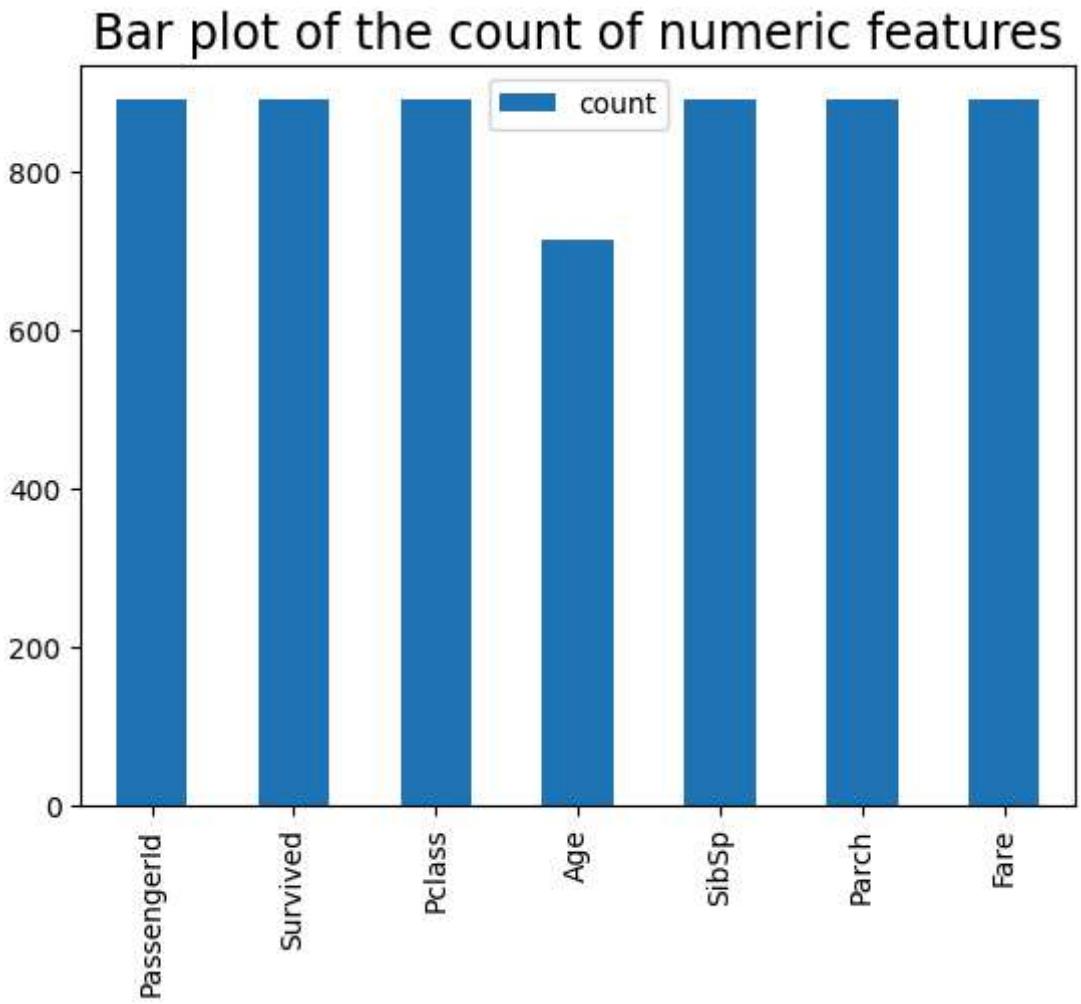
```
d=train.describe()
d
```

	PassengerId	Survived	Pclass	Age	SibSp	Parch	Fare
count	891.000000	891.000000	891.000000	714.000000	891.000000	891.000000	891.000000
mean	446.000000	0.383838	2.308642	29.699118	0.523008	0.381594	32.204208
std	257.353842	0.486592	0.836071	14.526497	1.102743	0.806057	49.693429
min	1.000000	0.000000	1.000000	0.420000	0.000000	0.000000	0.000000
25%	223.500000	0.000000	2.000000	20.125000	0.000000	0.000000	7.910400
50%	446.000000	0.000000	3.000000	28.000000	0.000000	0.000000	14.454200
75%	668.500000	1.000000	3.000000	38.000000	1.000000	0.000000	31.000000
max	891.000000	1.000000	3.000000	80.000000	8.000000	6.000000	512.329200

Next steps: View recommended plots

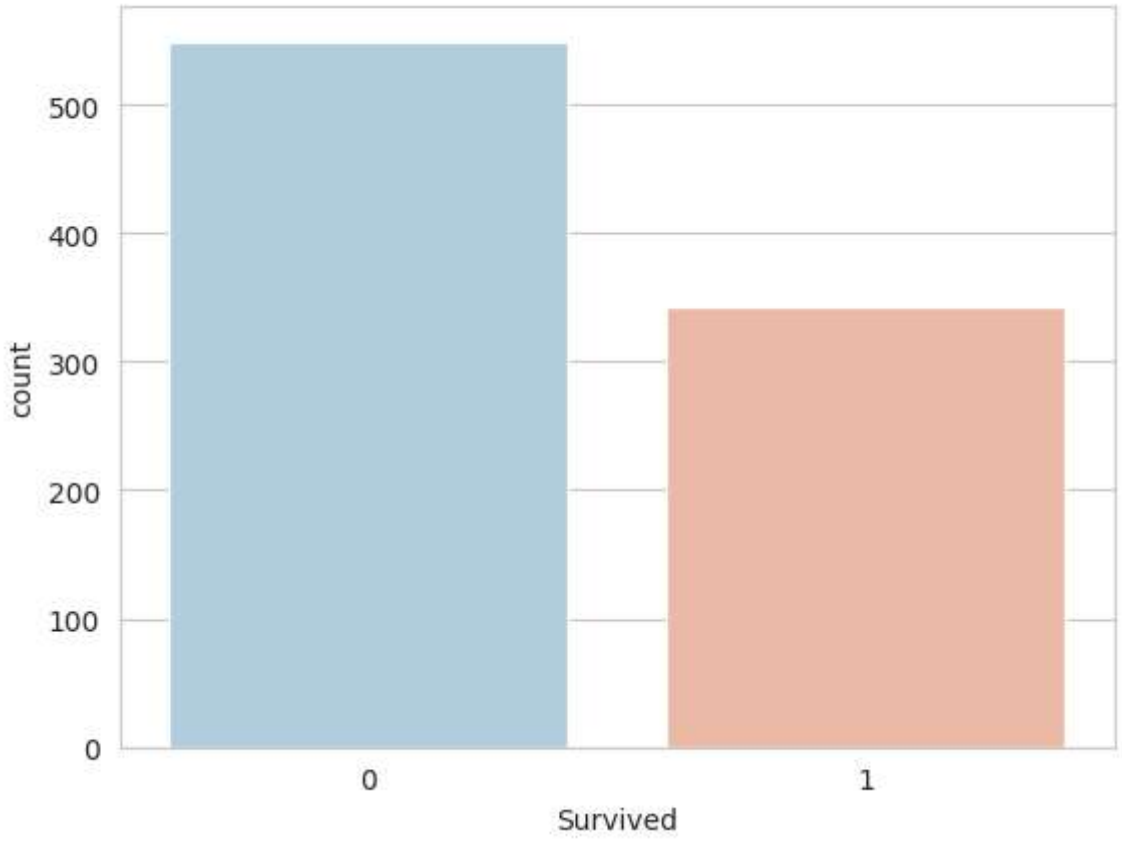
```
dT=d.T
dT.plot.bar(y='count')
plt.title("Bar plot of the count of numeric features",fontsize=17)
```

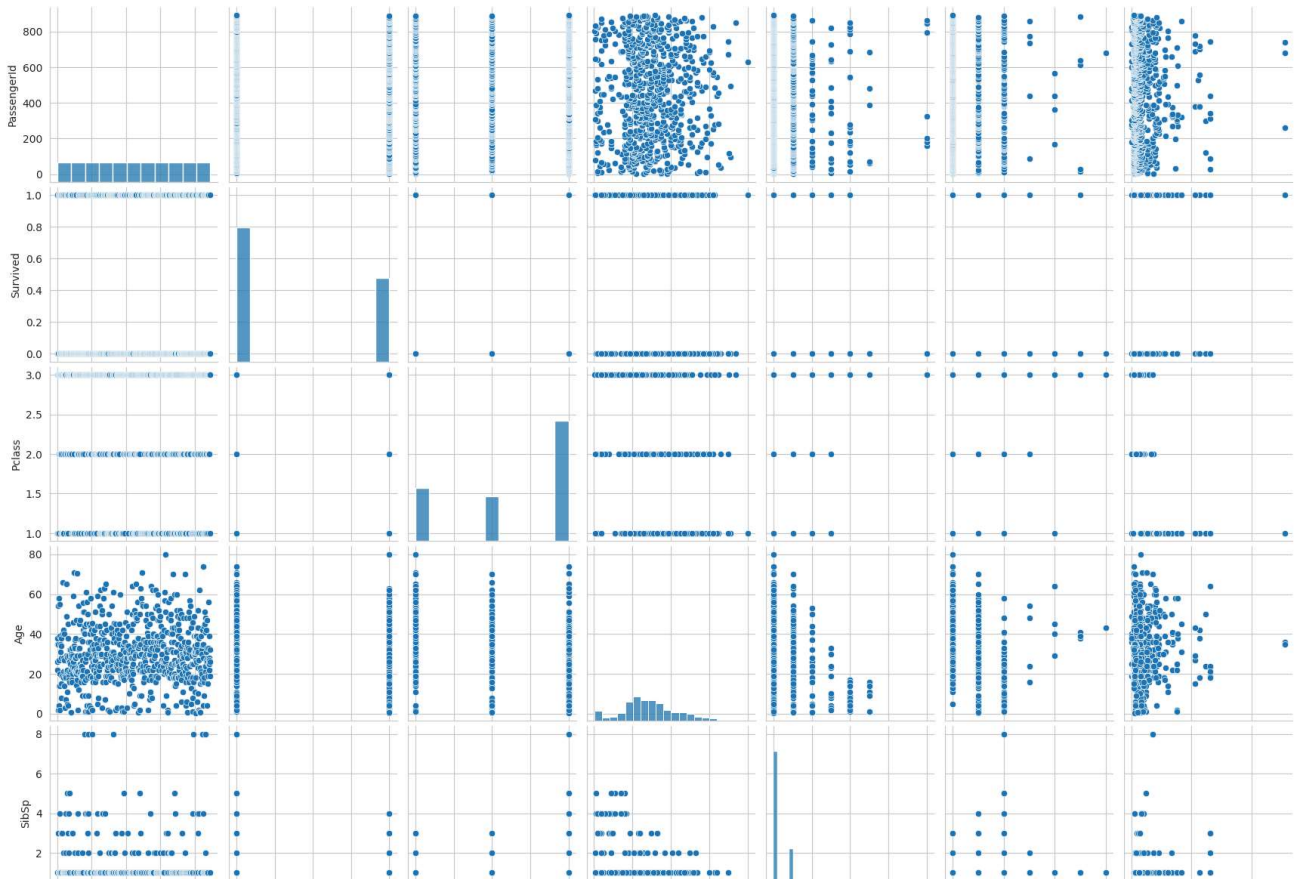
```
Text(0.5, 1.0, 'Bar plot of the count of numeric features')
```

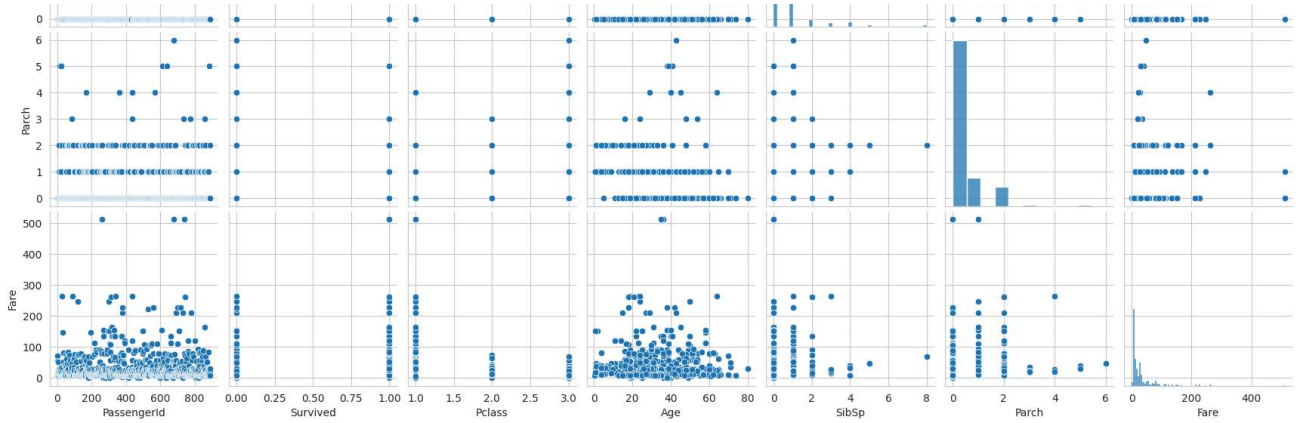



```
sns.set_style('whitegrid')
sns.countplot(x='Survived',data=train,palette='RdBu_r')
sns.pairplot(train)
```

```
<ipython-input-5-3d95a3593ccf>:2: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed in v0.14

  sns.countplot(x='Survived',data=train,palette='RdBu_r')
<seaborn.axisgrid.PairGrid at 0x7ee08c673be0>
```

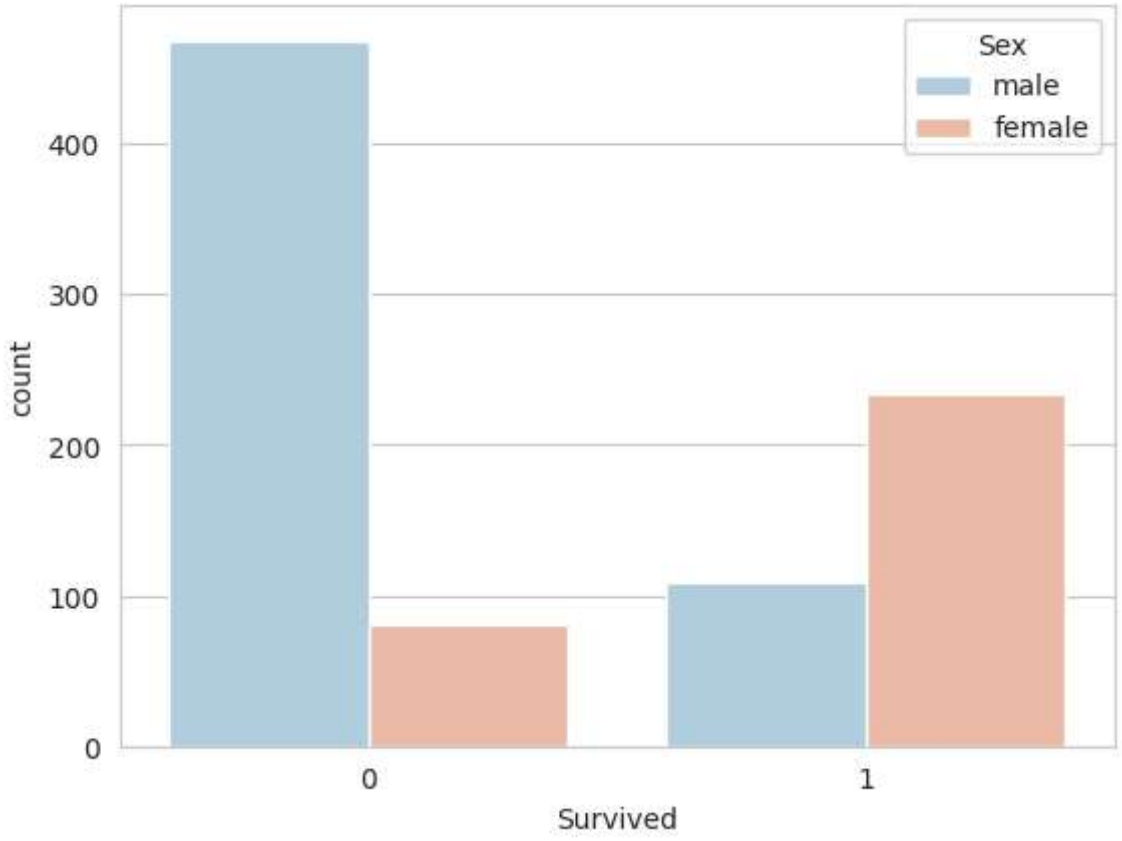






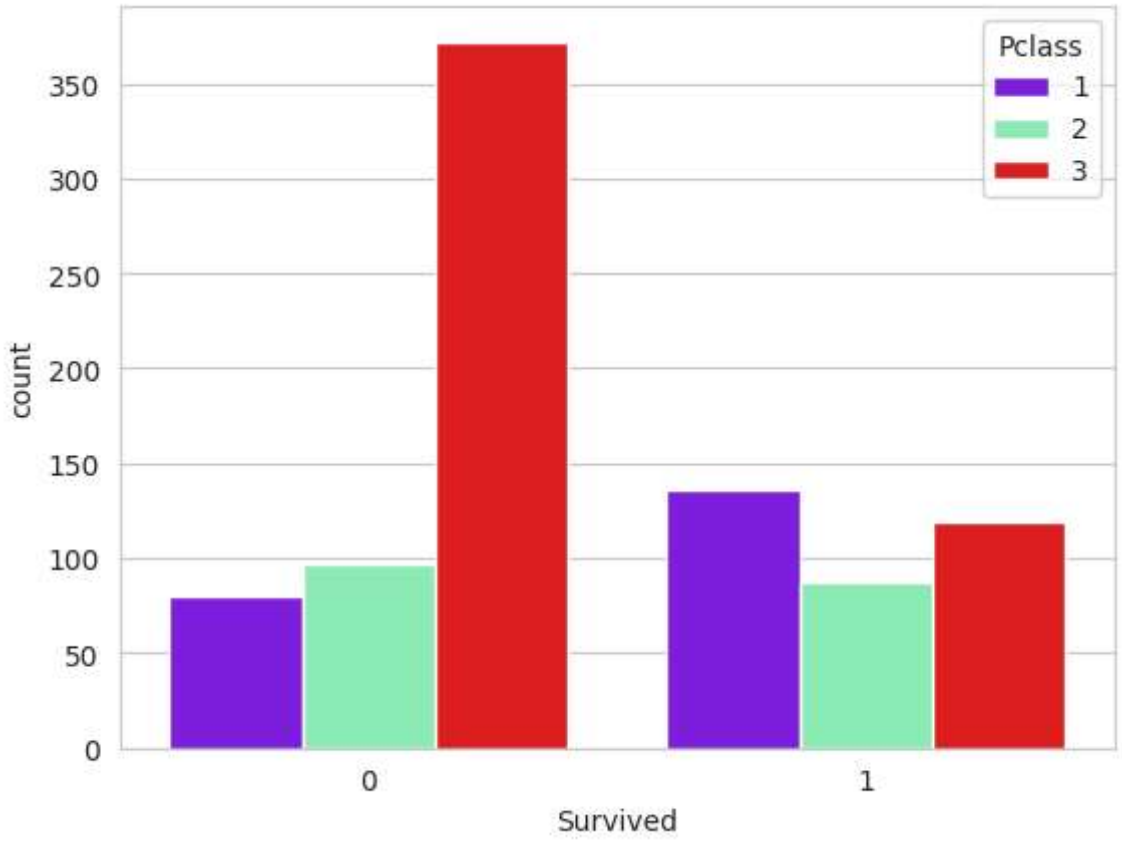

```
sns.set_style('whitegrid')
sns.countplot(x='Survived',hue='Sex',data=train,palette='RdBu_r')
```

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



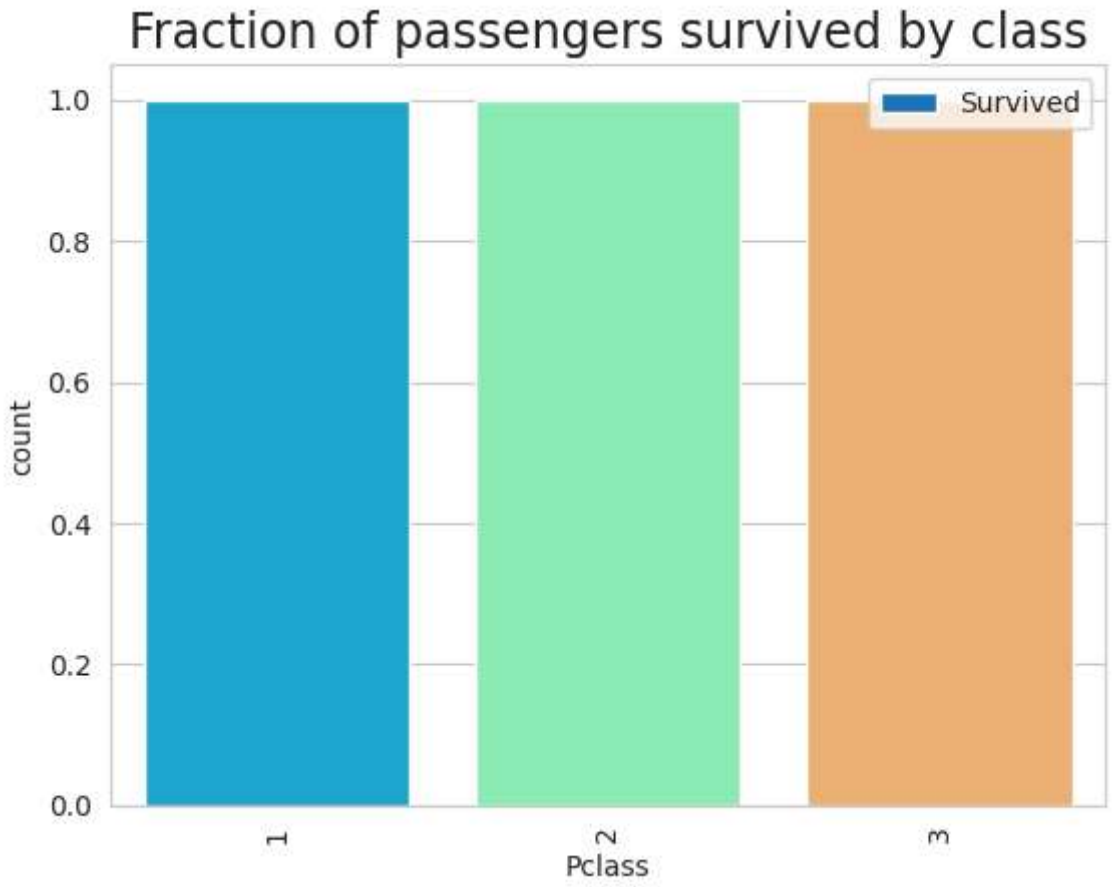

```
sns.set_style('whitegrid')
sns.countplot(x='Survived',hue='Pclass',data=train,palette='rainbow')
```

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



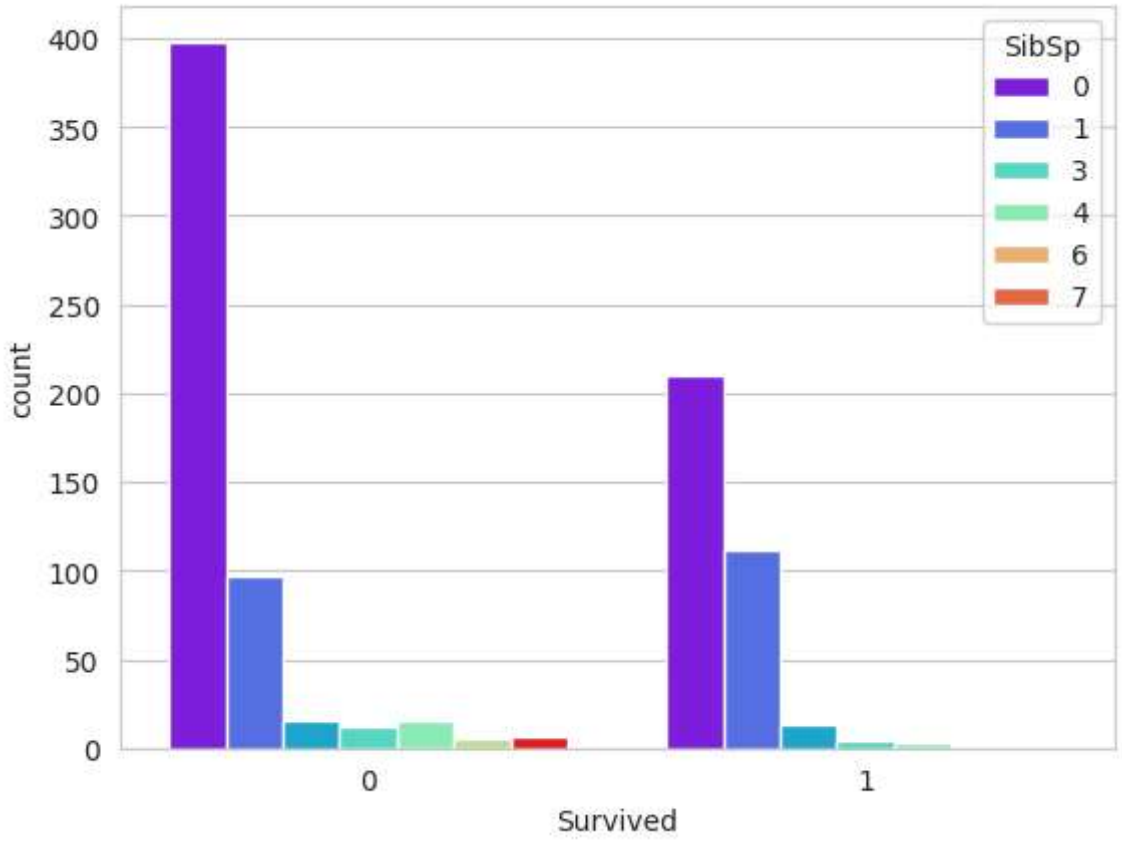

```
f_class_survived=train.groupby('Pclass')['Survived'].mean()
f_class_survived = pd.DataFrame(f_class_survived)
f_class_survived
f_class_survived.plot.bar(y='Survived')
sns.countplot(x='Survived',data=f_class_survived,palette='rainbow')
plt.title("Fraction of passengers survived by class",fontsize=17)
```

```
<ipython-input-8-0920c7b673ab>:5: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed in v0.14.0.

  sns.countplot(x='Survived',data=f_class_survived,palette='rainbow')
Text(0.5, 1.0, 'Fraction of passengers survived by class')
```



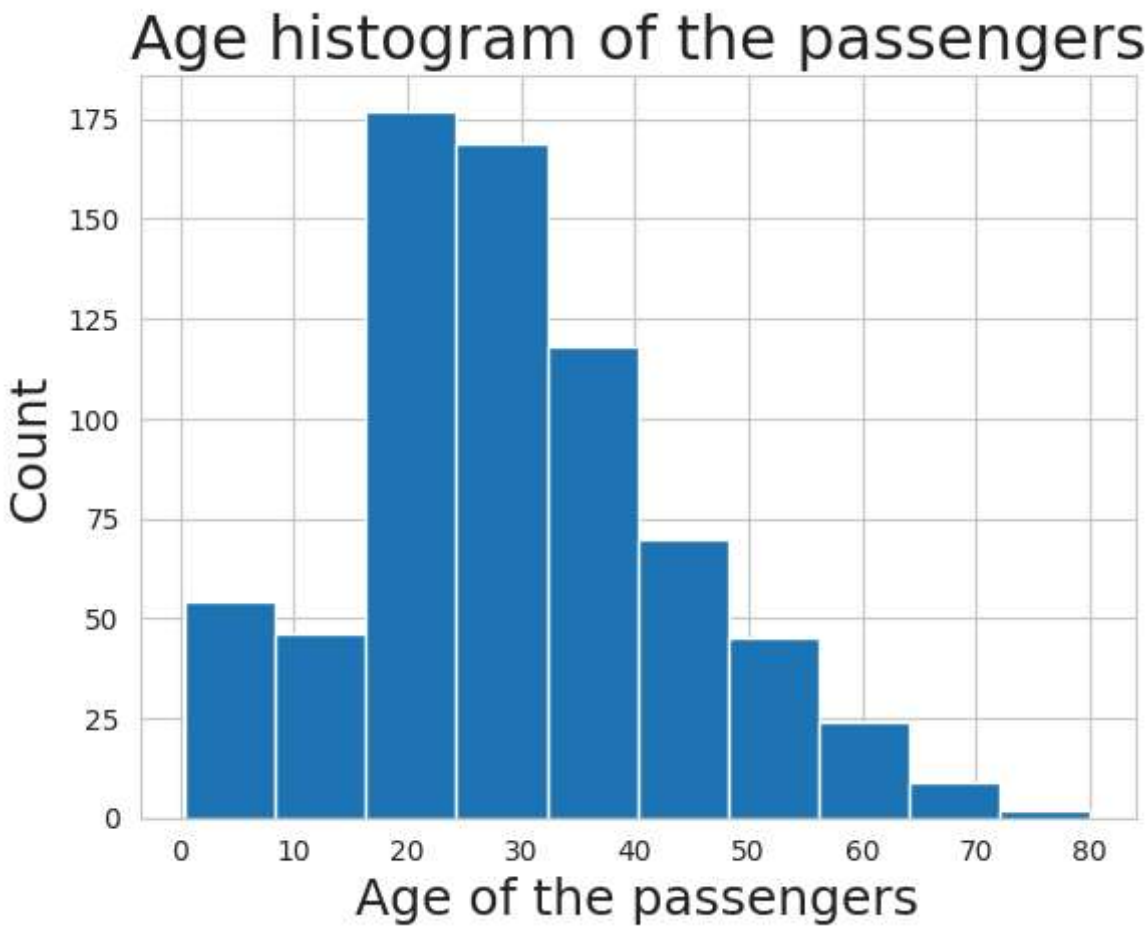

```
sns.set_style('whitegrid')
sns.countplot(x='Survived',hue='SibSp',data=train,palette='rainbow')
```

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



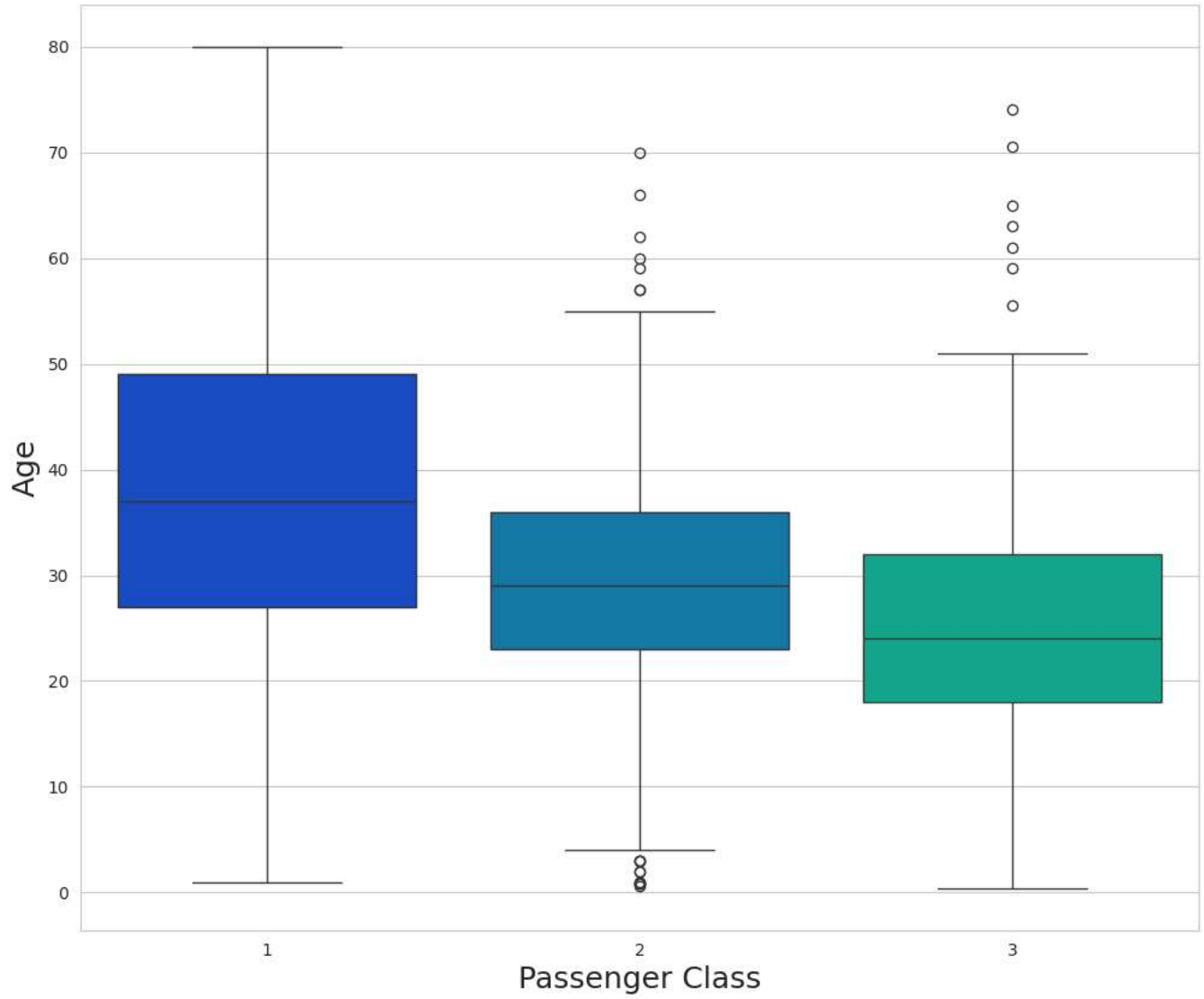

```
plt.xlabel("Age of the passengers",fontsize=18)
plt.ylabel("Count",fontsize=18)
plt.title("Age histogram of the passengers",fontsize=22)
#train['Age'].hist(bins=30,color='darkred',alpha=0.7,figsize=(10,6))
train['Age'].hist()
```

```
<Axes: title={'center': 'Age histogram of the passengers'}, xlabel='Age of the
passengers', ylabel='Count'>
```



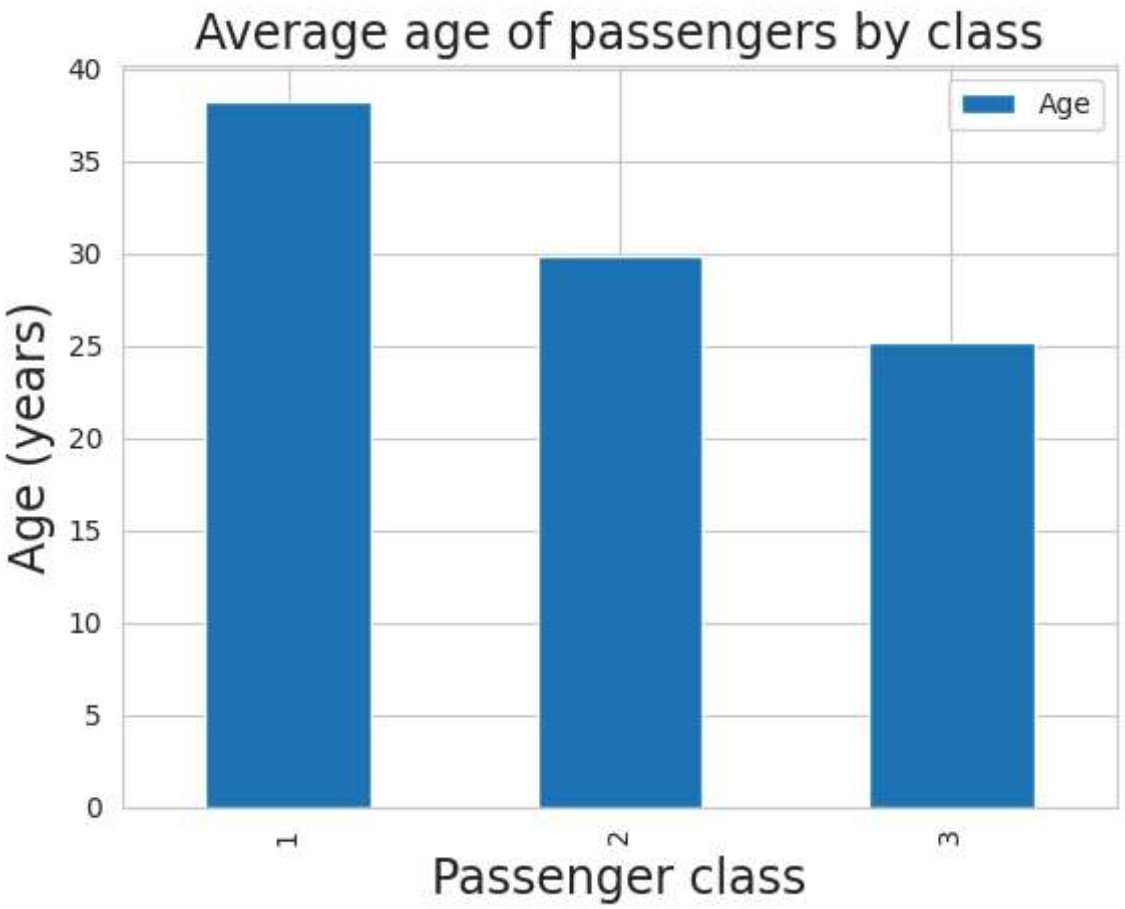

```
plt.figure(figsize=(12, 10))
plt.xlabel("Passenger Class",fontsize=18)
plt.ylabel("Age",fontsize=18)
sns.boxplot(x='Pclass',y='Age',data=train,palette='winter')
```

```
<ipython-input-11-2a1e3ee6c4a4>:4: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed in v0.14.0.

  sns.boxplot(x='Pclass',y='Age',data=train,palette='winter')
<Axes: xlabel='Passenger Class', ylabel='Age'>
```



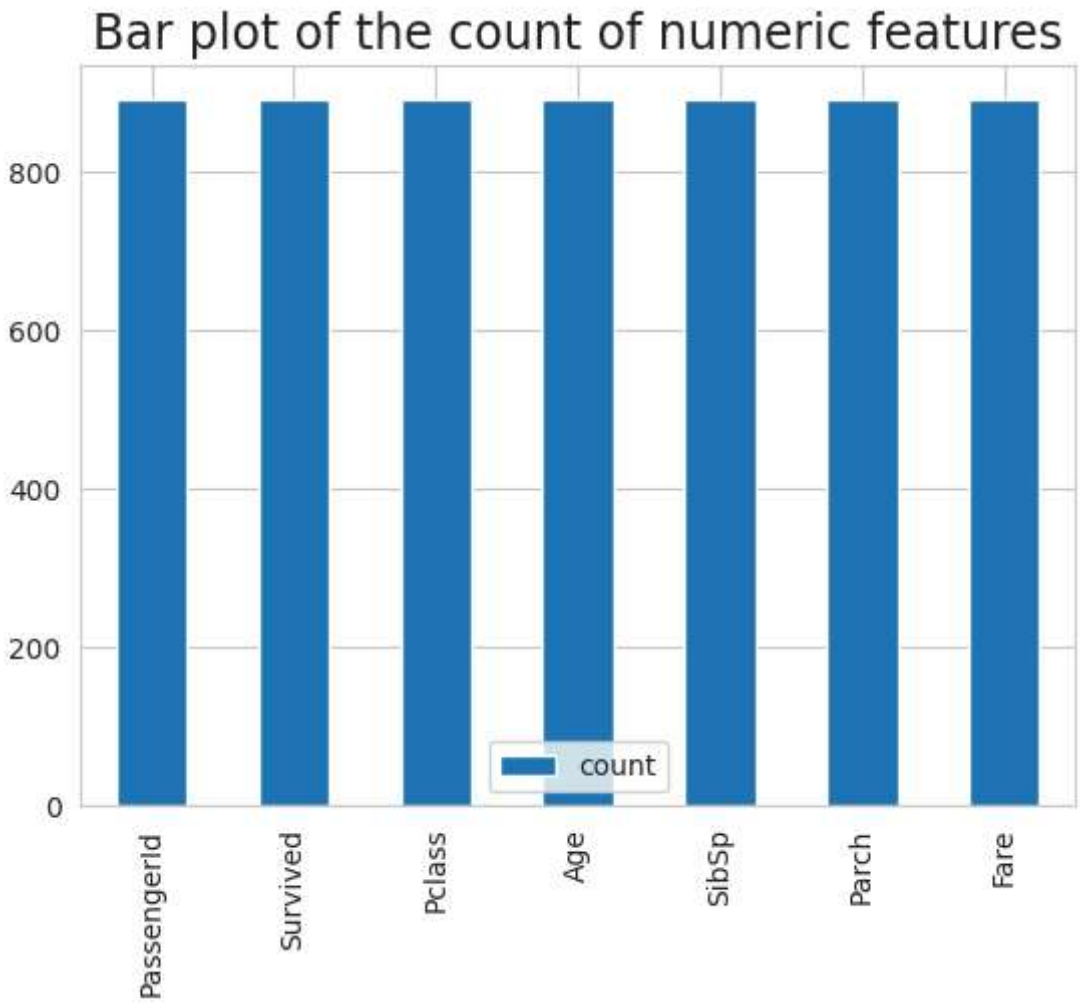

```
f_class_Age=train.groupby('Pclass')['Age'].mean()
f_class_Age = pd.DataFrame(f_class_Age)
f_class_Age.plot.bar(y='Age')
plt.title("Average age of passengers by class",fontsize=17)
plt.ylabel("Age (years)", fontsize=17)
plt.xlabel("Passenger class", fontsize=17)
```

```
Text(0.5, 0, 'Passenger class')
```




```
a=list(f_class_Age['Age'])
def impute_age(cols):
  Age = cols[0]
  Pclass = cols[1]
  if pd.isnull(Age):
    if Pclass == 1:
      return a[0]
    elif Pclass == 2:
      return a[1]
    else:
      return a[2]
  else:
    return Age


train['Age'] = train[['Age','Pclass']].apply(impute_age,axis=1)
d=train.describe()
dT=d.T
dT.plot.bar(y='count')
plt.title("Bar plot of the count of numeric features",fontsize=17)
```

```
Text(0.5, 1.0, 'Bar plot of the count of numeric features')
```




```
train.drop('Cabin',axis=1,inplace=True)
train.dropna(inplace=True)
train.head()
```

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Far
0	1	0	3	Braund, Mr. Owen Harris	male	22.0	1	0	A/5 21171	7.250
1	2	1	1	Cumings, Mrs. John Bradley (Florence Briggs Th...	female	38.0	1	0	PC 17599	71.283
2	3	1	3	Heikkinen, Miss. Laina	female	26.0	0	0	STON/O2. 3101282	7.925
3	4	1	1	Futrelle, Mrs. Jacques Heath (Lily May Peel)	female	35.0	1	0	113803	53.100
4	5	0	3	Allen, Mr. William Henry	male	35.0	0	0	373450	8.050

Next steps: View recommended plots

```
train.drop(['PassengerId','Name','Ticket'],axis=1,inplace=True)
train.dropna(inplace=True)
train.head()
```

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

Next steps: View recommended plots

```
sex = pd.get_dummies(train['Sex'],drop_first=True)
embark = pd.get_dummies(train['Embarked'],drop_first=True)
```

```
train.drop(['Sex','Embarked'],axis=1,inplace=True)
train = pd.concat([train,sex,embark],axis=1)
train.head()
```

	Survived	Pclass	Age	SibSp	Parch	Fare	male	Q	S
0	0	3	22.0	1	0	7.2500	1	0	1
1	1	1	38.0	1	0	71.2833	0	0	0
2	1	3	26.0	0	0	7.9250	0	0	1
3	1	1	35.0	1	0	53.1000	0	0	1
4	0	3	35.0	0	0	8.0500	1	0	1

Next steps: View recommended plots

```
from sklearn.model_selection import train_test_split
X_train, X_test, y_train, y_test = train_test_split(train.drop('Survived',axis=1),train['Su
```

```
from sklearn.linear_model import LogisticRegression
from sklearn.metrics import classification_report
nsimu=201
penalty=[0]*nsimu
logmodel=[0]*nsimu
predictions =[0]*nsimu
class_report = [0]*nsimu
f1=[0]*nsimu
for i in range(1,nsimu):
  logmodel[i] =(LogisticRegression(C=i/1000,tol=1e-4, max_iter=int(1e6),n_jobs=4))
  logmodel[i].fit(X_train,y_train)
  predictions[i] = logmodel[i].predict(X_test)
  class_report[i] = classification_report(y_test,predictions[i])
  l=class_report[i].split()
```