```
In [75]:
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

```
In [76]:
df = pd.read_csv('titanic.csv')
```

```
In [77]:
df.head()
```

Out[77]:

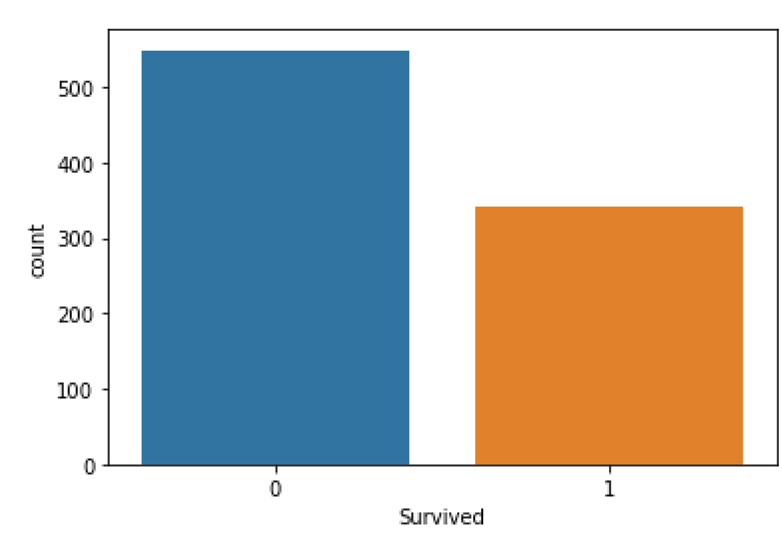
	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare	Cabin	Embarked
0	1	0	3	Braund, Mr. Owen Harris	male	22.0	1	0	A/5 21171	7.2500	NaN	S
1	2	1	1	Cumings, Mrs. John Bradley (Florence Briggs Th...	female	38.0	1	0	PC 17599	71.2833	C85	C
2	3	1	3	Heikkinen, Miss. Laina	female	26.0	0	0	STON/O2. 3101282	7.9250	NaN	S
3	4	1	1	Futrelle, Mrs. Jacques Heath (Lily May Peel)	female	35.0	1	0	113803	53.1000	C123	S
4	5	0	3	Allen, Mr. William Henry	male	35.0	0	0	373450	8.0500	NaN	S

```
In [135...
df.corr().mean()
```

```
Out[135...
Survived    -0.011129
Pclass       0.108780
Sex          0.066700
Age          0.017554
SibSp        0.150346
Parch        0.153805
Embarked     0.169158
dtype: float64
```

```
In [78]:
sns.countplot(x='Survived', data=df)
```

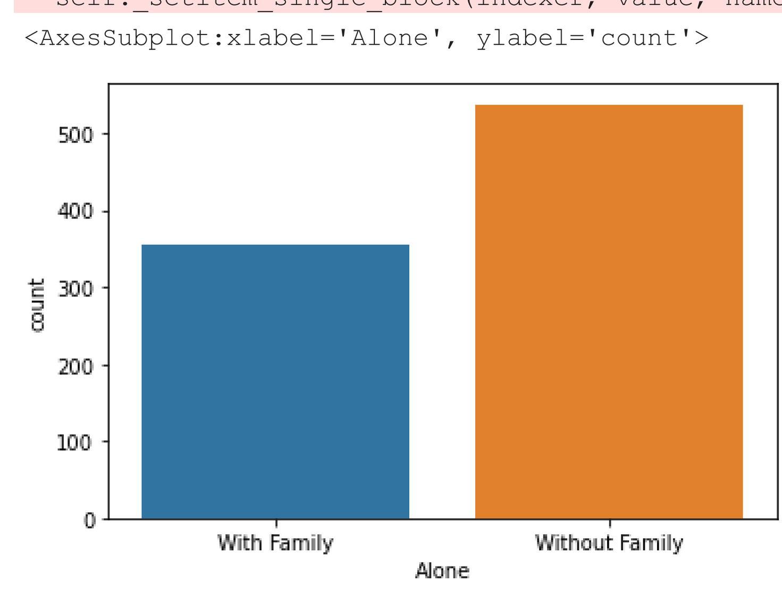
Out[78]: <AxesSubplot:xlabel='Survived', ylabel='count'>




```
In [79]:
## Let's check who are with family and who are alone
## This can be found by adding Parch and Sibsp columns
df['Alone'] = df.Parch + df.SibSp

## if Alone value is >0 then they are with family else they are Alone
df['Alone'].loc[df['Alone']>0] = 'With Family'
df['Alone'].loc[df['Alone'] == 0] = 'Without Family'

sns.countplot(x=df['Alone'])
```

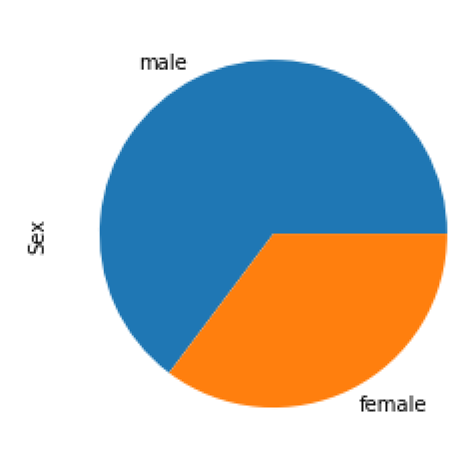
```
C:\Users\LENOVO\anaconda3\lib\site-packages\pandas\core\indexing.py:1637: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
  self._setitem_single_block(indexer, value, name)
```

Out[79]: <AxesSubplot:xlabel='Alone', ylabel='count'>



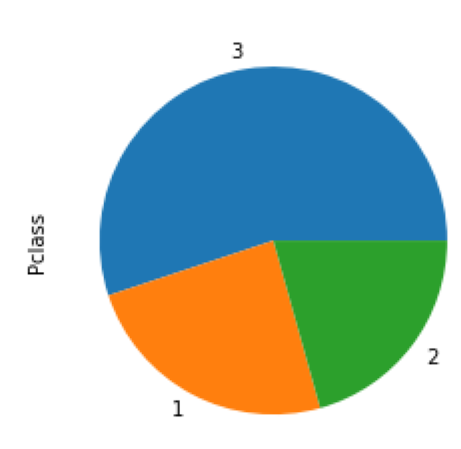

```
In [80]:
df['Sex'].value_counts().plot(kind='pie')
```

Out[80]: <AxesSubplot:ylabel='Sex'>



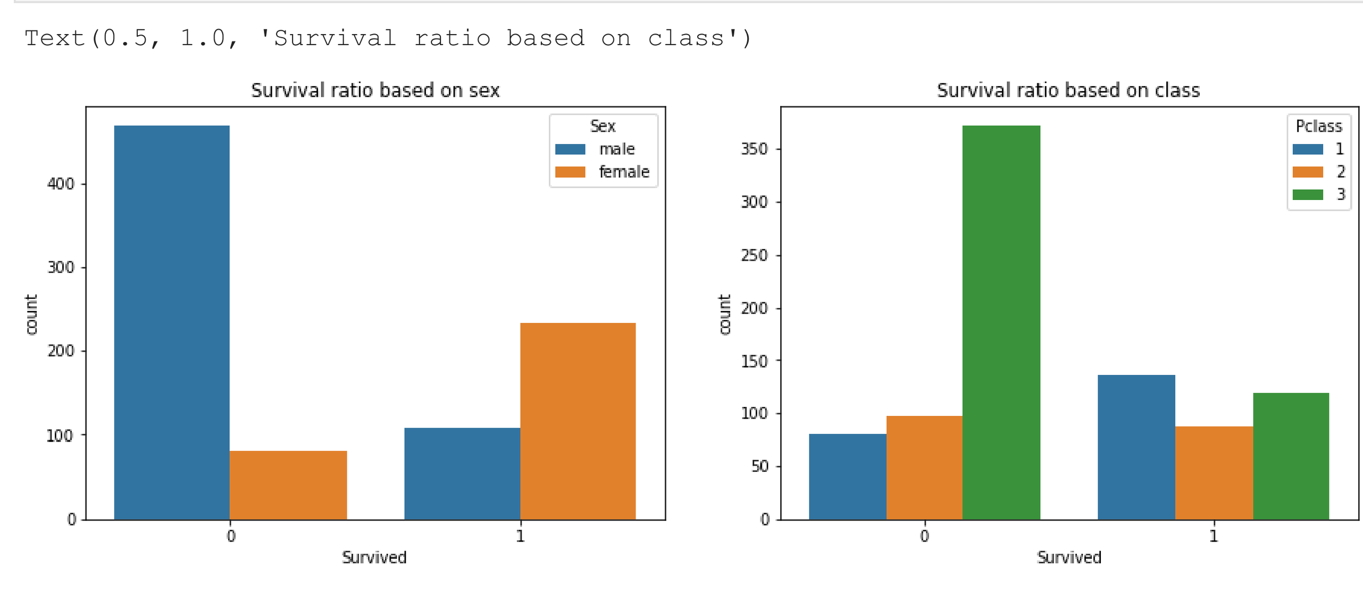

```
In [81]:
df['Pclass'].value_counts().plot(kind='pie')
```

Out[81]: <AxesSubplot:ylabel='Pclass'>




```
In [82]:
plt.figure(figsize=(15,5))
plt.subplot(1,2,1)
sns.countplot(x=df['Survived'],hue=df['Sex'])
plt.title('Survival ratio based on sex')

plt.subplot(1,2,2)
sns.countplot(x=df['Survived'],hue=df['Pclass'])
plt.title('Survival ratio based on class')
```

Out[82]: Text(0.5, 1.0, 'Survival ratio based on class')



Data Cleaning

```
In [83]:
df.isna().sum()
```

```
Out[83]:
PassengerId      0
Survived         0
Pclass           0
Name             0
Sex              0
Age            177
SibSp            0
Parch            0
Ticket           0
Fare             0
Cabin          687
Embarked         2
Alone            0
dtype: int64
```

```
In [84]:
df.drop(['Cabin'],axis=1,inplace=True)
```

```
In [85]:
df.dropna(inplace=True)
```

```
In [86]:
df.isna().sum()
```

```
Out[86]:
PassengerId    0
Survived       0
Pclass         0
Name           0
Sex            0
Age            0
SibSp          0
Parch          0
Ticket         0
Fare           0
Embarked       0
Alone          0
dtype: int64
```

```
In [87]:
df.drop(['PassengerId','Name','Ticket','Fare','Alone'],axis=1,inplace=True)
```

```
In [88]:
df.head()
```

Out[88]:

	Survived	Pclass	Sex	Age	SibSp	Parch	Embarked
0	0	3	male	22.0	1	0	S
1	1	1	female	38.0	1	0	C
2	1	3	female	26.0	0	0	S
3	1	1	female	35.0	1	0	S
4	0	3	male	35.0	0	0	S

```
In [89]:
from sklearn.preprocessing import LabelEncoder
```

```
In [90]:
le = LabelEncoder()
le.fit(df['Sex'])
df['Sex'] = le.transform(df['Sex'])

le.fit(df['Embarked'])
df['Embarked'] = le.transform(df['Embarked'])
```

Traning and test

```
In [91]:
from sklearn.model_selection import train_test_split
```

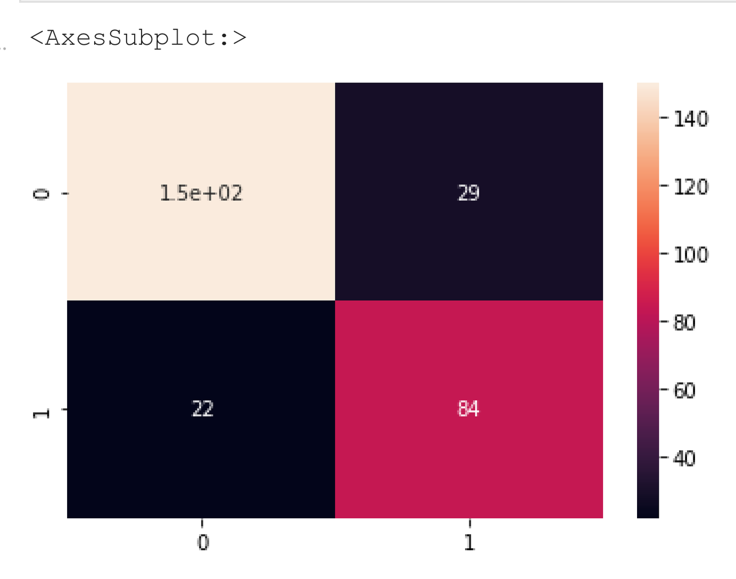
```
In [136...
x = df.drop(['Survived'],axis=1)
y = df['Survived']

x_train,x_test,y_train,y_test = train_test_split(x,y,train_size=0.6,random_state=101)
```

Model Building

1)Logistic Regression

```
In [137...
from sklearn.linear_model import LogisticRegression
from sklearn.metrics import accuracy_score,confusion_matrix

lg = LogisticRegression(max_iter=450)
lg.fit(x_train,y_train)
lg_predict = lg.predict(x_test)
lg_cm = confusion_matrix(lg_predict,y_test)
sns.heatmap(lg_cm,annot=True)
```

Out[137...: <AxesSubplot:>



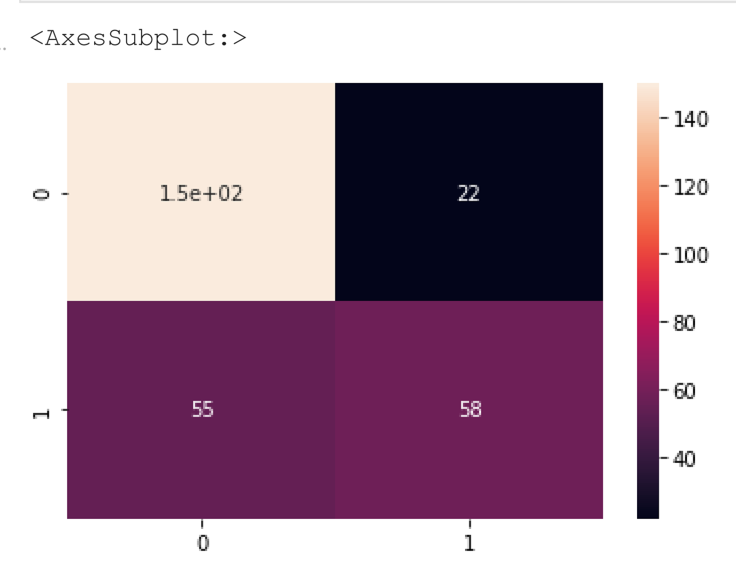

```
In [138...
accuracy_score(y_test,lg_predict)
```

Out[138...: 0.8210526315789474

2) K-Nearest Neighbor

```
In [139...
from sklearn.neighbors import KNeighborsClassifier

kn = KNeighborsClassifier(n_neighbors=5)
kn.fit(x_train,y_train)
kn_predict = kn.predict(x_test)
kn_cm = confusion_matrix(y_test,kn_predict)
sns.heatmap(kn_cm,annot=True)
```

Out[139...: <AxesSubplot:>



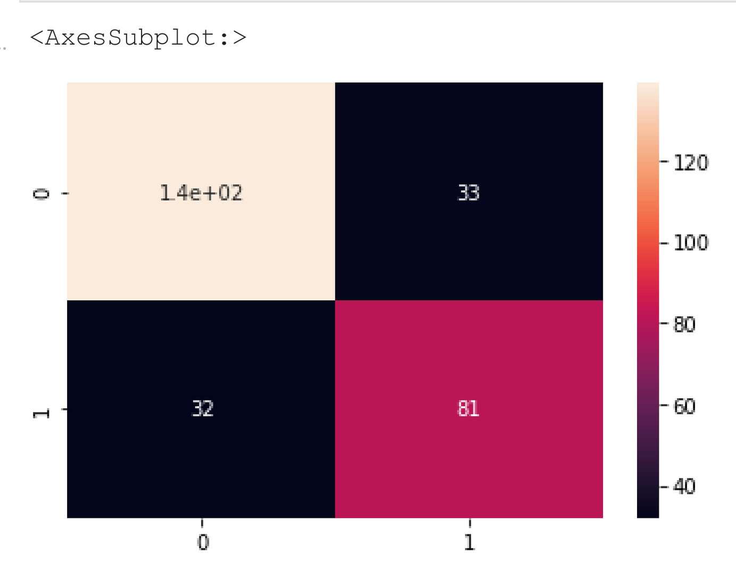

```
In [140...
accuracy_score(y_test,kn_predict)
```

Out[140...: 0.7298245614035088

3)Decision Tree

```
In [141...
from sklearn.tree import DecisionTreeClassifier

dt = DecisionTreeClassifier()
dt.fit(x_train,y_train)
dt_predict = dt.predict(x_test)
dt_cm = confusion_matrix(y_test,dt_predict)
sns.heatmap(dt_cm,annot=True)
```

Out[141...: <AxesSubplot:>



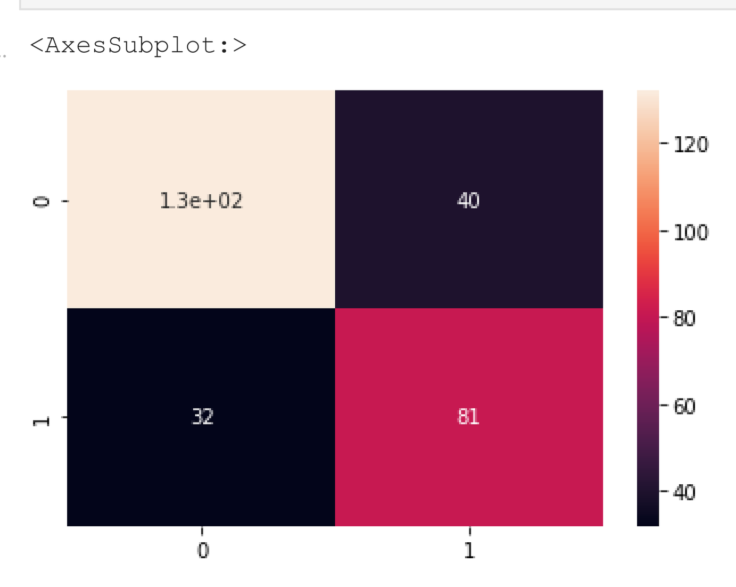

```
In [142...
accuracy_score(y_test,dt_predict)
```

Out[142...: 0.7719298245614035

4)Random Forest

```
In [143...
from sklearn.ensemble import RandomForestClassifier

rf = RandomForestClassifier()
rf.fit(x_train,y_train)
rf_predict = rf.predict(x_test)
rf_cm = confusion_matrix(y_test,rf_predict)
sns.heatmap(rf_cm,annot=True)
```

Out[143...: <AxesSubplot:>



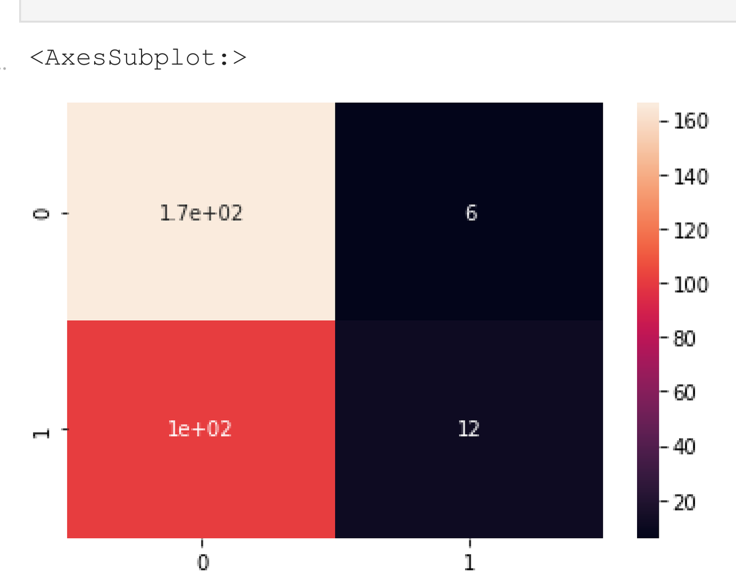

```
In [144...
accuracy_score(y_test,rf_predict)
```

Out[144...: 0.7473684210526316

5)Support Vector Machine

```
In [145...
from sklearn.svm import SVC

svm = SVC()
svm.fit(x_train,y_train)
svm_predict = svm.predict(x_test)
svm_cm = confusion_matrix(y_test,svm_predict)
sns.heatmap(svm_cm,annot=True)
```

Out[145...: <AxesSubplot:>




```
In [146...
accuracy_score(y_test,svm_predict)
```

Out[146...: 0.624561403508772

So in all above Model LogisticRegression has the highest accuracy of 82%

```
In [ ]:
```