In [4]:
```
import seaborn as sns
import pandas as pd
import matplotlib.pyplot as plt
import numpy as np
```

In [5]:
```
sns.get_dataset_names()
```

Out[5]:
```
['anagrams',
 'anscombe',
 'attention',
 'brain_networks',
 'car_crashes',
 'diamonds',
 'dots',
 'dowjones',
 'exercise',
 'flights',
 'fmri',
 'geyser',
 'glue',
 'healthexp',
 'iris',
 'mpg',
 'penguins',
 'planets',
 'seaice',
 'taxis',
 'tips',
 'titanic']
```

In [6]:
```
data = sns.load_dataset("titanic")
```

In [7]:
```
data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 891 entries, 0 to 890
Data columns (total 15 columns):
 #   Column       Non-Null Count  Dtype
---  ------       --------------  -----
 0   survived     891 non-null    int64
 1   pclass       891 non-null    int64
 2   sex          891 non-null    object
 3   age          714 non-null    float64
 4   sibsp        891 non-null    int64
 5   parch        891 non-null    int64
 6   fare         891 non-null    float64
 7   embarked     889 non-null    object
 8   class        891 non-null    category
 9   who          891 non-null    object
 10  adult_male   891 non-null    bool
 11  deck         203 non-null    category
 12  embark_town  889 non-null    object
 13  alive        891 non-null    object
 14  alone        891 non-null    bool
dtypes: bool(2), category(2), float64(2), int64(4), object(5)
memory usage: 80.7+ KB
```

In [8]:
```
data.head()
```

Out[8]:

	survived	pclass	sex	age	sibsp	parch	fare	embarked	class	who	adult_male	deck	embark_town	alive	alone
0	0	3	male	22.0	1	0	7.2500	S	Third	man	True	NaN	Southampton	no	False
1	1	1	female	38.0	1	0	71.2833	C	First	woman	False	C	Cherbourg	yes	False
2	1	3	female	26.0	0	0	7.9250	S	Third	woman	False	NaN	Southampton	yes	True
3	1	1	female	35.0	1	0	53.1000	S	First	woman	False	C	Southampton	yes	False
4	0	3	male	35.0	0	0	8.0500	S	Third	man	True	NaN	Southampton	no	True

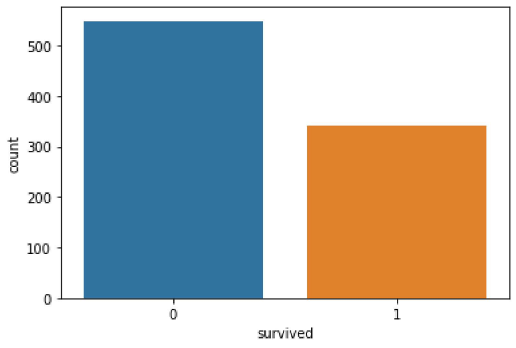
In [9]:
```
len(data)
```

Out[9]:
```
891
```

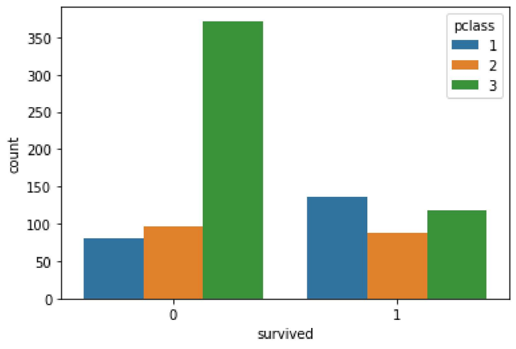
In [10]:
```
data['survived'].value_counts()
```

Out[10]:
```
0    549
1    342
Name: survived, dtype: int64
```

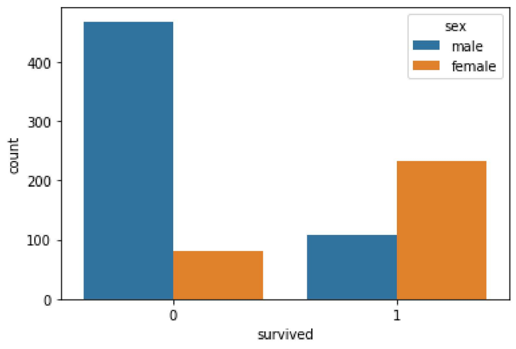
In [11]:
```
sns.countplot(x=data['survived'])
plt.show()
```



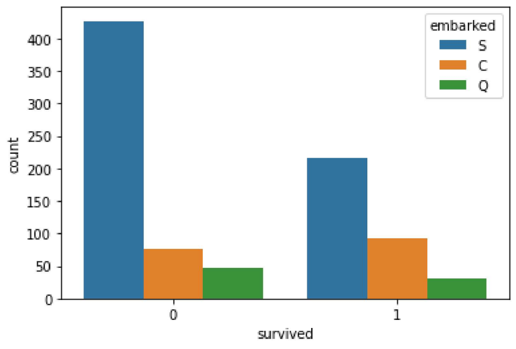
In [12]:
```
sns.countplot(x=data['survived'], hue=data['pclass'])
plt.show()
```



In [13]:
```
sns.countplot(x=data['survived'], hue=data['sex'])
plt.show()
```



In [14]:
```
sns.countplot(x=data['survived'], hue=data['embarked'])
plt.show()
```



In [15]:
```
data.columns
```

Out[15]:
```
Index(['survived', 'pclass', 'sex', 'age', 'sibsp', 'parch', 'fare',
       'embarked', 'class', 'who', 'adult_male', 'deck', 'embark_town',
       'alive', 'alone'],
      dtype='object')
```

In [16]:
```
cols =['fare', 'class', 'who', 'adult_male', 'deck', 'embark_town', 'alive', 'alone']
```

In [17]:
```
data_new = data.drop(cols, axis=1)
data_new
```

Out[17]:

	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
...	...	...	...	...	...	...	...
886	0	2	male	27.0	0	0	S
887	1	1	female	19.0	0	0	S
888	0	3	female	NaN	1	2	S
889	1	1	male	26.0	0	0	C
890	0	3	male	32.0	0	0	Q

891 rows × 7 columns

In [18]:
```
data_new.isnull().sum()
```

Out[18]:
```
survived      0
pclass        0
sex           0
age         177
sibsp         0
parch         0
embarked      2
dtype: int64
```

In [19]:
```
mean_age = data_new["age"].mean()
mean_age = np.round(mean_age, 2)
mean_age
```

Out[19]:
```
29.7
```

In [20]:
```
data_new['age'] = data_new['age'].fillna(mean_age)
```

In [21]:
```
data_new.isnull().sum()
```

Out[21]:
```
survived    0
pclass      0
sex         0
age         0
sibsp       0
parch       0
embarked    2
dtype: int64
```

In [22]:
```
data_new = data_new.dropna()
```

In [23]:
```
data_new.isnull().sum()
```

Out[23]:
```
survived    0
pclass      0
sex         0
age         0
sibsp       0
parch       0
embarked    0
dtype: int64
```

In [24]:
```
from sklearn.preprocessing import LabelEncoder
enc = LabelEncoder()
data_new['sex'] = enc.fit_transform(data_new['sex'])
```

```
C:\Users\shara\AppData\Local\Temp/ipykernel_24672/67093066.py:3: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-ve
rsus-a-copy (https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy)
  data_new['sex'] = enc.fit_transform(data_new['sex'])
```

In [25]:
```
data_new['embarked'] = enc.fit_transform(data_new['embarked'])
```

```
C:\Users\shara\AppData\Local\Temp/ipykernel_24672/992371747.py:1: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-ve
rsus-a-copy (https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy)
  data_new['embarked'] = enc.fit_transform(data_new['embarked'])
```

In [26]:
```
x = np.array(data_new.iloc[:,1:])
```

In [27]:
```
y = np.array(data_new.iloc[:,0])
```

In [28]:
```
from sklearn.model_selection import train_test_split
xtrain, xtest, ytrain, ytest = train_test_split(x, y, train_size = 0.8, random_state = 3)
```

In [29]:
```
pd.DataFrame(y).value_counts()
```

Out[29]:
```
0    549
1    340
dtype: int64
```

In [30]:
```
pd.DataFrame(ytrain).value_counts()
```

Out[30]:
```
0    439
1    272
dtype: int64
```

In [31]:
```
from sklearn.neighbors import KNeighborsClassifier
model = KNeighborsClassifier(n_neighbors=3, p=2)
```

In [32]:
```
model.fit(xtrain, ytrain)
```

Out[32]:
```
KNeighborsClassifier(n_neighbors=3)
```

In [33]:
```
ypred = model.predict(xtest)
```

In [35]:
```
ytest[1] == ypred[1]
```

Out[35]:
```
True
```

In [36]:
```
count = 0
for i in range(len(ytest)):
  if ypred[i] == ytest[i]:
    count = count + 1
count
```

Out[36]:
```
133
```

In [37]:
```
count/len(ytest)
```

Out[37]:
```
0.7471910112359551
```

In [38]:
```
from sklearn.metrics import accuracy_score
a = accuracy_score(ytest,ypred)
a
```

Out[38]:
```
0.7471910112359551
```

In [39]:
```
from sklearn.metrics import confusion_matrix
cm = confusion_matrix(ytest, ypred)
cm
```

Out[39]:
```
array([[92, 18],
       [27, 41]], dtype=int64)
```

In [40]:
```
acc = (94+45)/(94+16+23+45)
acc
```

Out[40]:
```
0.7808988764044944
```

In [41]:
```
import joblib
joblib.dump(model, "titanic.pkl")
```

Out[41]:
```
['titanic.pkl']
```

In [ ]:
```
mymodel = joblib.load("/content/titanic.pkl")
```

In [ ]:
```
mymodel.predict(xtest)
```

In [ ]:
```
mymodel.predict([[1,1,22,2,0,1]])
```

In [ ]:
```
d={}
for i in range(1,439):
  model = KNeighborsClassifier(n_neighbors=i, p=2)
  model.fit(xtrain, ytrain)
  ypred = model.predict(xtest)
  count = 0
  for j in range(len(ytest)):
    if ypred[j] == ytest[j]:
      count = count + 1
  d[i] = count/len(ytest)
for i, j in d.items():
  if j == max(d.values()):
    print(i,j)
```