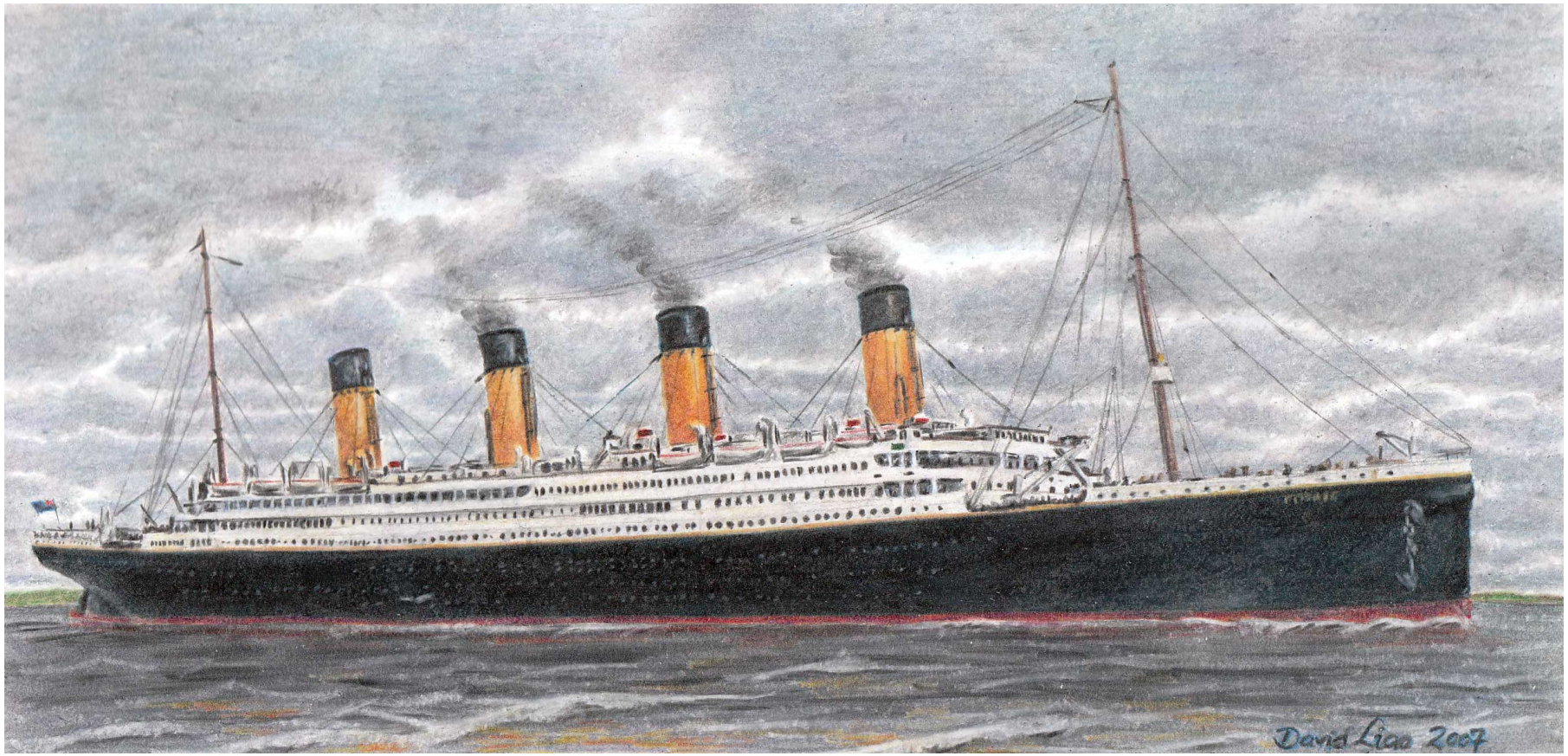
Análisis de datos con Python

Titanic



In [2]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import ipywidgets as widgets
from IPython import display
import seaborn as sns
```

```
df = pd.read_csv("titanic.csv")
```

In [2]:
```
print(df.shape, "\n")
print(df.columns,"\n")
```

```
(891, 12)

Index(['PassengerId', 'Survived', 'Pclass', 'Name', 'Sex', 'Age', 'SibSp',
       'Parch', 'Ticket', 'Fare', 'Cabin', 'Embarked'],
      dtype='object')
```

In [3]:
```
df.info()
```

```
<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
```

Para visualizar un ejemplo del archivo:

1. df
2. df.head()
3. df.tail()

In [5]:
```
df = df.set_index("PassengerId")
df
```

Out[5]:

PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare	Cabin	Embarked
1	0	3	Braund, Mr. Owen Harris	male	22.0	1	0	A/5 21171	7.2500	NaN	S
2	1	1	Cumings, Mrs. John Bradley (Florence Briggs Th...	female	38.0	1	0	PC 17599	71.2833	C85	C
3	1	3	Heikkinen, Miss. Laina	female	26.0	0	0	STON/O2. 3101282	7.9250	NaN	S
4	1	1	Futrelle, Mrs. Jacques Heath (Lily May Peel)	female	35.0	1	0	113803	53.1000	C123	S
5	0	3	Allen, Mr. William Henry	male	35.0	0	0	373450	8.0500	NaN	S
...	...	...	...	...	...	...	...	...	...	...	...
887	0	2	Montvila, Rev. Juozas	male	27.0	0	0	211536	13.0000	NaN	S
888	1	1	Graham, Miss. Margaret Edith	female	19.0	0	0	112053	30.0000	B42	S
889	0	3	Johnston, Miss. Catherine Helen "Carrie"	female	NaN	1	2	W./C. 6607	23.4500	NaN	S
890	1	1	Behr, Mr. Karl Howell	male	26.0	0	0	111369	30.0000	C148	C
891	0	3	Dooley, Mr. Patrick	male	32.0	0	0	370376	7.7500	NaN	Q

891 rows × 11 columns

Supervivencia

In [57]:
```
sobrevivientes = df.loc[df["Survived"]==1,:]
sobrevivientes
```

Out[57]:

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare	Cabin	Embarked
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
8	9	1	3	Johnson, Mrs. Oscar W (Elisabeth Vilhelmina Berg)	female	27.0	0	2	347742	11.1333	NaN	S
9	10	1	2	Nasser, Mrs. Nicholas (Adele Achem)	female	14.0	1	0	237736	30.0708	NaN	C
...	...	...	...	...	...	...	...	...	...	...	...	...
875	876	1	3	Najib, Miss. Adele Kiamie "Jane"	female	15.0	0	0	2667	7.2250	NaN	C
879	880	1	1	Potter, Mrs. Thomas Jr (Lily Alexenia Wilson)	female	56.0	0	1	11767	83.1583	C50	C
880	881	1	2	Shelley, Mrs. William (Imanita Parrish Hall)	female	25.0	0	1	230433	26.0000	NaN	S
887	888	1	1	Graham, Miss. Margaret Edith	female	19.0	0	0	112053	30.0000	B42	S
889	890	1	1	Behr, Mr. Karl Howell	male	26.0	0	0	111369	30.0000	C148	C

342 rows × 12 columns

In [31]:
```
cantidad_pasajeros = len(df.index)
cantidad_sobrevivientes = df.loc[:,"Survived"].sum()

print(f"El titanic tuvo {cantidad_pasajeros} pasajeros, de los cuales {cantidad_sobrevivientes} pudieron sobrevivir a la tragedia
```

```
El titanic tuvo 891 pasajeros, de los cuales 342 pudieron sobrevivir a la tragedia.
```

Según el sexo de los pasajeros

In [63]:
```
df.groupby(["Sex"])[[ "Survived"]].sum()
```

Out[63]:

	Survived
Sex	
female	233
male	109

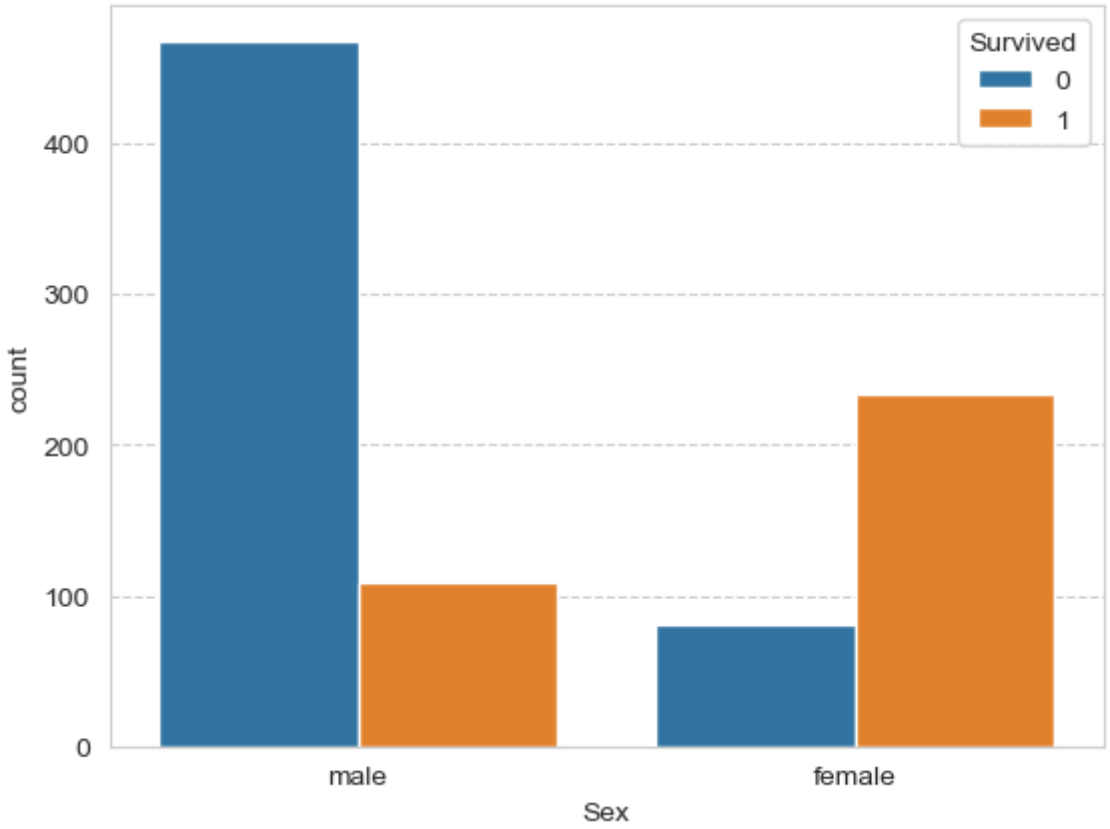
In [84]:
```
cantidad_sobrevivientes_h = df.loc[(df["Sex"]=="male"),["Survived"]].sum()
cantidad_sobrevivientes_m =df.loc[(df["Sex"]=="female"),["Survived"]].sum()

print(f"Hubo {cantidad_sobrevivientes} sobrevivientes:")
print(f"{cantidad_sobrevivientes_h[0]} fueron hombres y {cantidad_sobrevivientes_m[0]} fueron mujeres.")
```

```
Hubo 342 sobrevivientes:
109 fueron hombres y 233 fueron mujeres.
```

In [93]:
```
# Count plot
sns.set_style("whitegrid", {'grid.linestyle': '--'})
sns.countplot(x = df["Sex"], hue = df["Survived"])
```

Out[93]:
```
<AxesSubplot:xlabel='Sex', ylabel='count'>
```

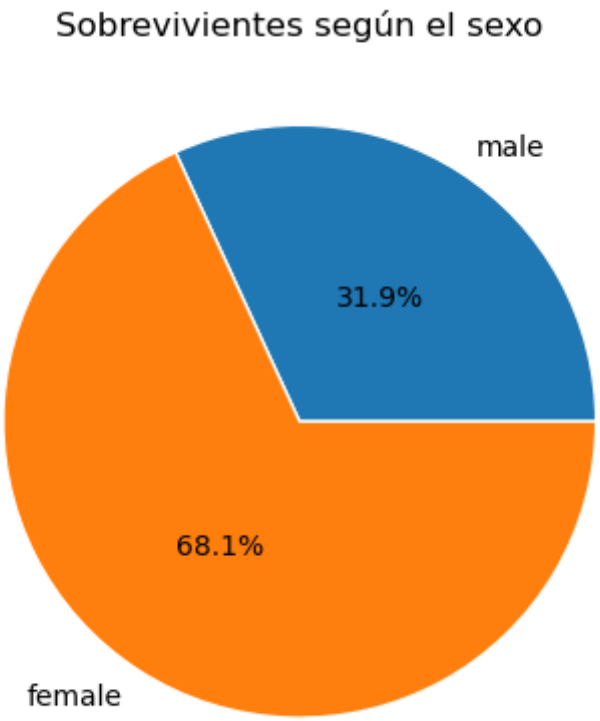


In [86]:
```
# Data
sexs = df.loc[:,"Sex"].unique()
value = pd.concat([cantidad_sobrevivientes_h, cantidad_sobrevivientes_m])

# Pie chart

fig, ax = plt.subplots()
ax.pie(value, labels = sexs, autopct = '%1.1f%%', pctdistance = 0.5, wedgeprops = {"linewidth": 1, "edgecolor": "white"})
plt.title("Sobrevivientes según el sexo")
# plt.show()
```

Out[86]:
```
Text(0.5, 1.0, 'Sobrevivientes según el sexo')
```



Según la edad de los pasajeros

In [62]:
```
df.loc[(df["Survived"]==1), :].groupby(["Sex"])[[ "Age"]].mean().round()
```

Out[62]:

Sex	Age
female	29.0
male	27.0

In [83]:
```
promedioedad_sobrevivientes_h = df.loc[(df["Survived"]==1) & (df["Sex"]=="male"), ["Age"]].mean()
promedioedad_sobrevivientes_m = df.loc[(df["Survived"]==1) & (df["Sex"]=="female"), ["Age"]].mean()
```

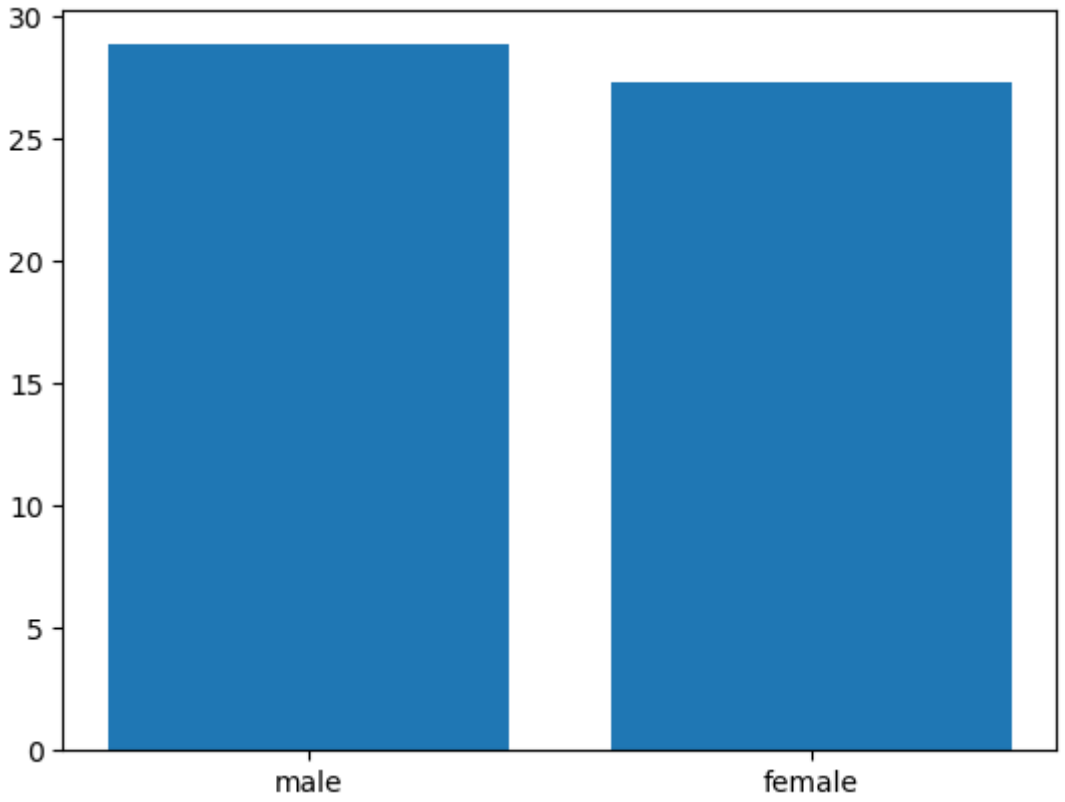
```
print(f"El promedio de edad de los hombres que sobrevivieron fue de {round(promedioedad_sobrevivientes_h[0])} años.")
print(f"El promedio de edad de las mujeres que sobrevivieron fue de {round(promedioedad_sobrevivientes_m[0])} años.")
```

```
El promedio de edad de los hombres que sobrevivieron fue de 27 años.
El promedio de edad de las mujeres que sobrevivieron fue de 29 años.
```

In [92]:
```
# Data
x = sexs
y = df.loc[(df["Survived"]==1), :].groupby(["Sex"])[[ "Age"]].mean().to_numpy().flatten()

# Bar plot
fig, ax = plt.subplots()
ax.bar(x = x, height = y)
# plt.show()
```

Out[92]:
```
<BarContainer object of 2 artists>
```



Según la clase de los pasajeros

In [15]:
```
df.loc[(df["Survived"]==1), ["Pclass", "Survived"]].groupby(["Pclass"]).sum()
```

Out[15]:

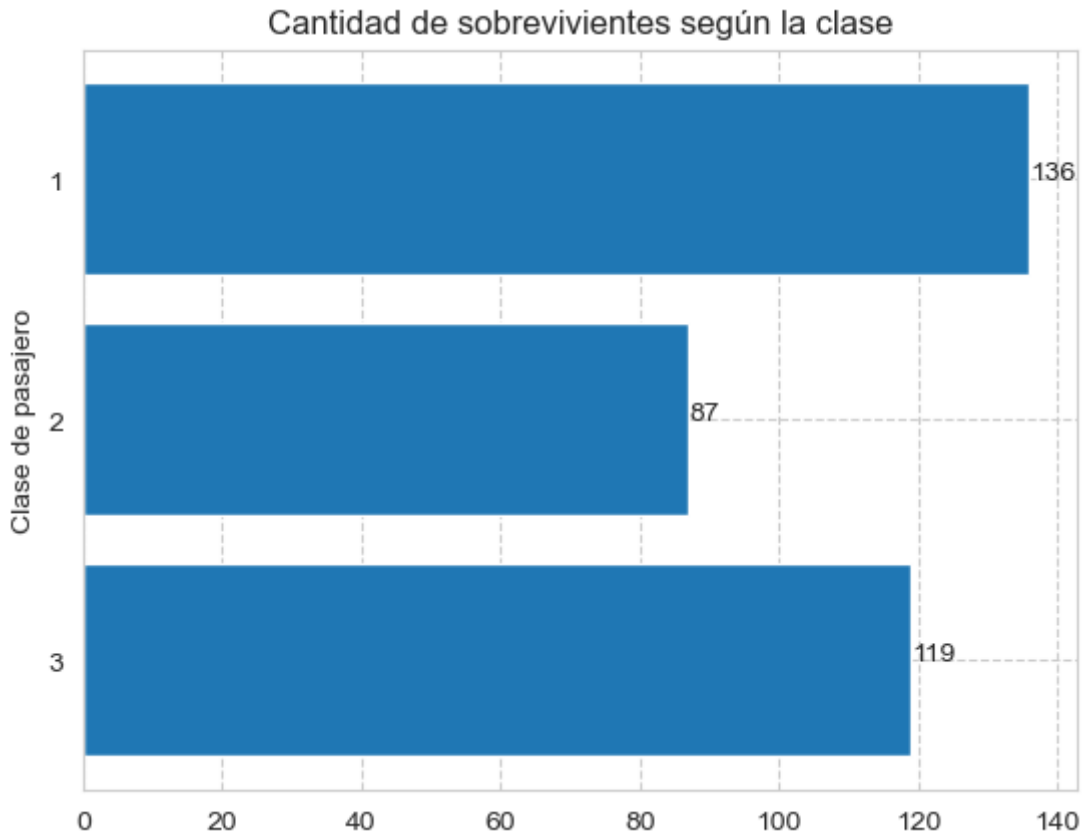
Pclass	Survived
1	136
2	87
3	119

In [61]:
```
# Data
x = df["Pclass"].sort_values(ascending=False).unique().astype('str')
y = df.loc[(df["Survived"]==1), ["Pclass", "Survived"]].groupby(["Pclass"]).sum().to_numpy().flatten()[::-1]

# Bar plot
fig, ax = plt.subplots()
ax.barh(x, width = y)
for index, value in enumerate(y):
    plt.text(value, index,
             str(value))
ax.set_ylabel('Clase de pasajero')
ax.set_title('Cantidad de sobrevivientes según la clase')

# plt.show()
```

Out[61]:
```
Text(0.5, 1.0, 'Cantidad de sobrevivientes según la clase')
```



Según clase y sexo de los pasajeros

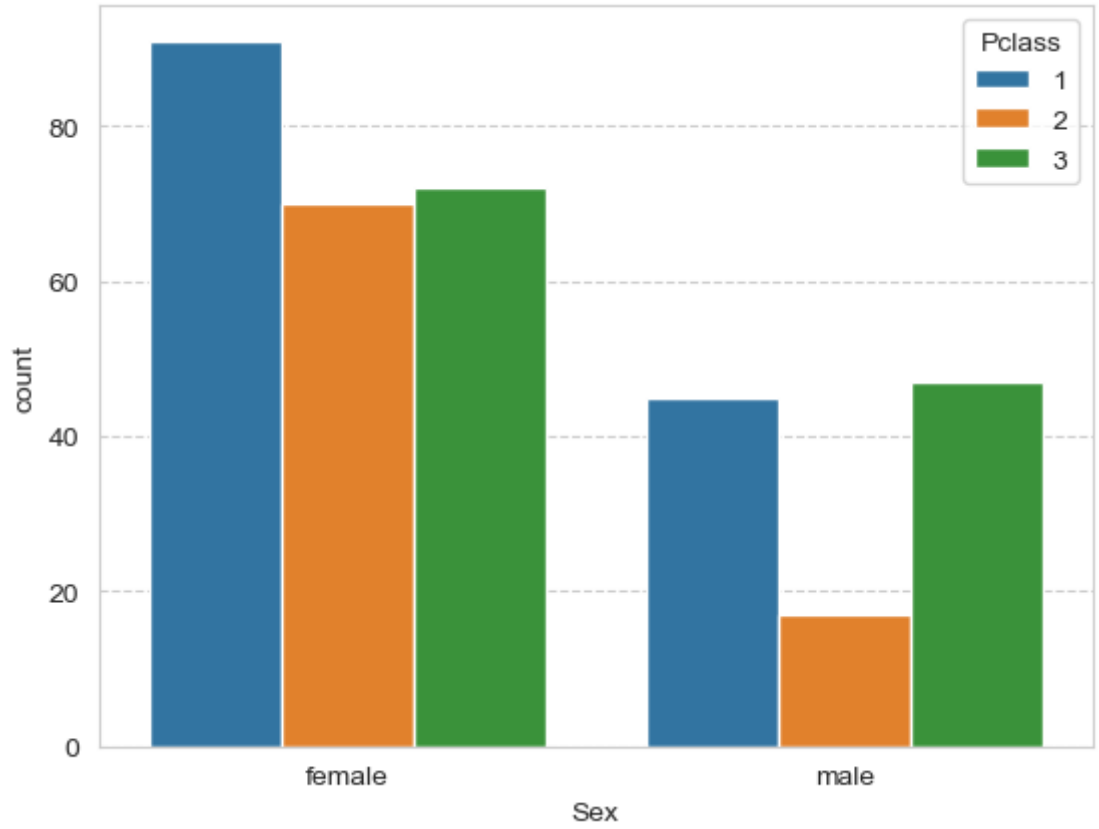
In [64]:
```
df.groupby(["Pclass","Sex"])[["Pclass", "Sex", "Survived"]].sum()
```

Out[64]:

Pclass	Sex	Pclass	Survived
1	female	94	91
	male	122	45
2	female	152	70
	male	216	17
3	female	432	72
	male	1041	47

In [54]:
```
# Count plot
sns.set_style("whitegrid", {'grid.linestyle': '--'})
sns.countplot(x = sobrevivientes["Sex"], hue = df["Pclass"])
```

Out[54]:
```
<AxesSubplot:xlabel='Sex', ylabel='count'>
```


Pclass
1
2
3
80
60
40
20
0
count
female
male
Sex