In [8]:
```
# importing libraries
import pandas as pd
import numpy as np
import seaborn as sns
```

In [2]:
```
df = pd.read_csv("titanic.csv")
```

In [3]:
```
df.columns
```

Out[3]:
```
Index(['PassengerId', 'Survived', 'Pclass', 'Name', 'Sex', 'Age', 'SibSp',
       'Parch', 'Ticket', 'Fare', 'Cabin', 'Embarked'],
      dtype='object')
```

In [4]:
```
df.describe()
```

Out[4]:

	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

In [5]:
```
df.isnull().sum()
```

Out[5]:
```
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
```

In [7]:
```
Q1=df['Age'].quantile(0.25)
Q3=df['Age'].quantile(0.75)
IQR=Q3-Q1
print("IQR(", IQR, ") =", "Q3(", Q3, ")- Q1(", Q1, ")")

# This code calculates the Interquartile Range (IQR) of the 'Age' column in the dataframe 'df'.
# The first line calculates the 25th percentile of the 'Age' column and assigns it to variable Q1.
# The second line calculates the 75th percentile of the 'Age' column and assigns it to variable Q3
# The third line calculates the difference between Q3 and Q1 and assigns it to variable IQR.
# Finally, the code prints the value of IQR along with the values of Q1 and Q3 for reference.
```

```
IQR( 17.875 ) = Q3( 38.0 )- Q1( 20.125 )
```

the IQR of the 'Age' column is 17.875, which means that 50% of the values lie within this range (from Q1 to Q3).

In [7]:
```
lower_limit=Q1-IQR
upper_limit=Q3+IQR
lower_limit,upper_limit
```

Out[7]: (2.25, 55.875)

Based on the IQR, the lower and upper limits have been calculated as follows:

Lower Limit = Q1 - 1.5 *IQR* = *20.125* - *1.5* 17.875 = 2.25

Upper Limit = Q3 + 1.5 *IQR* = *38.0* + *1.5* 17.875 = 55.875

These limits are used to identify outliers in the 'Age' column of the dataset. Any value less than the lower limit or greater than the upper limit is considered as an outlier.

In [8]:
```
df_without_outliers=df[(df['Age']>lower_limit)&(df['Age']<upper_limit)]
df_without_outliers
# creating a new DataFrame called "df_without_outliers".
# This new DataFrame is created by selecting only the rows from the original DataFrame "df" wh
# certain lower limit and less than a certain upper limit.
```

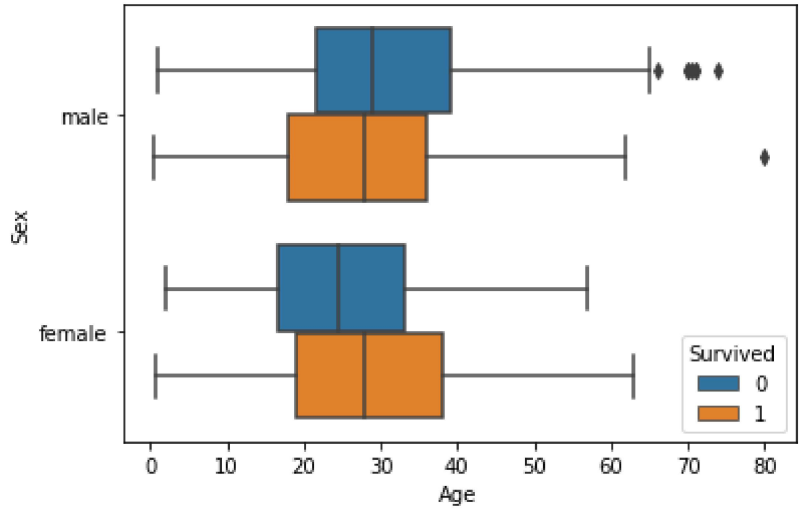
Out[8]:

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare	Ca
0	1	0	3	Braund, Mr. Owen Harris	male	22.0	1	0	A/5 21171	7.2500	N
1	2	1	1	Cumings, Mrs. John Bradley (Florence Briggs Th...	female	38.0	1	0	PC 17599	71.2833	C
2	3	1	3	Heikkinen, Miss. Laina	female	26.0	0	0	STON/O2. 3101282	7.9250	N
3	4	1	1	Futrelle, Mrs. Jacques Heath (Lily May Peel)	female	35.0	1	0	113803	53.1000	C
4	5	0	3	Allen, Mr. William Henry	male	35.0	0	0	373450	8.0500	N
...	...	...	...	...	...	...	...	...	...	...	
885	886	0	3	Rice, Mrs. William (Margaret Norton)	female	39.0	0	5	382652	29.1250	N
886	887	0	2	Montvila, Rev. Juozas	male	27.0	0	0	211536	13.0000	N
887	888	1	1	Graham, Miss. Margaret Edith	female	19.0	0	0	112053	30.0000	B
889	890	1	1	Behr, Mr. Karl Howell	male	26.0	0	0	111369	30.0000	C
890	891	0	3	Dooley, Mr. Patrick	male	32.0	0	0	370376	7.7500	N

651 rows × 12 columns

In [9]:
```
sns.boxplot(x='Age' , y='Sex', hue='Survived' ,data = df)
# the distribution of ages for males and females separately, and for each group,
# the boxplot will be colored differently based on whether they survived or not.
# This can help to visually explore any relationship between age, sex, and survival in the Titanic
```

Out[9]:
```
<AxesSubplot:xlabel='Age', ylabel='Sex'>
```



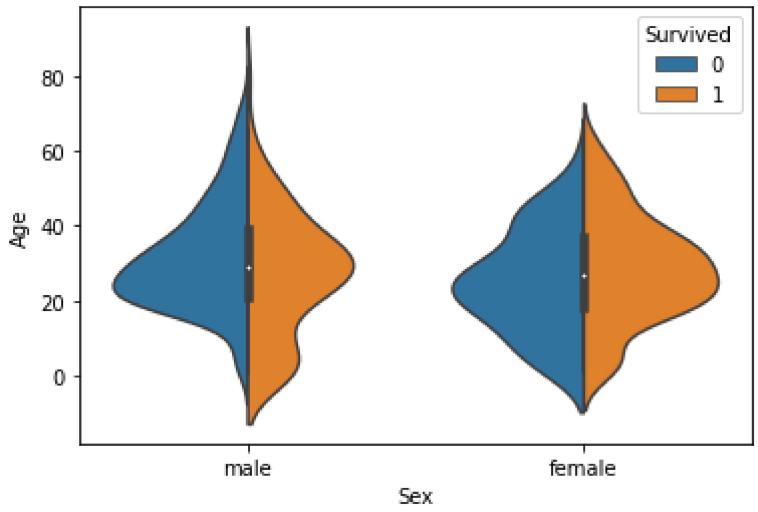
In [1]:
```
sns.boxplot(x='Age' , y='Sex', hue='Survived' ,data = df_without_outliers)
# without outliers
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[1], line 1
----> 1 sns.boxplot(x='Age' , y='Sex', hue='Survived' ,data = df_without_outliers)

NameError: name 'sns' is not defined
```

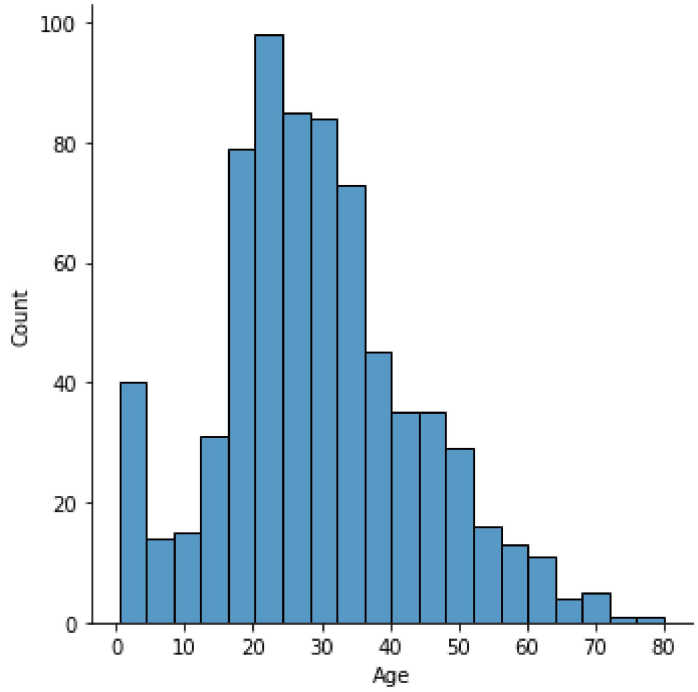
In [10]:
```
sns.violinplot(x='Sex', y='Age', data=df, hue="Survived",split=True)
```

Out[10]: <AxesSubplot:xlabel='Sex', ylabel='Age'>



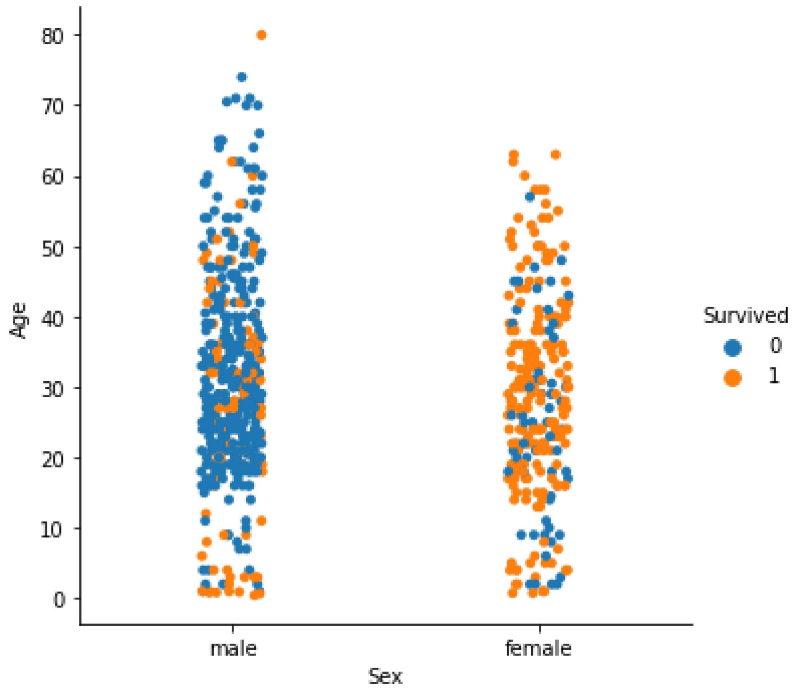
In [11]:
```
sns.displot(df['Age'])
```

Out[11]: <seaborn.axisgrid.FacetGrid at 0x7fc97b81bdf0>



In [12]:
```
sns.catplot(x='Sex',y='Age' , data=df,hue='Survived')
```

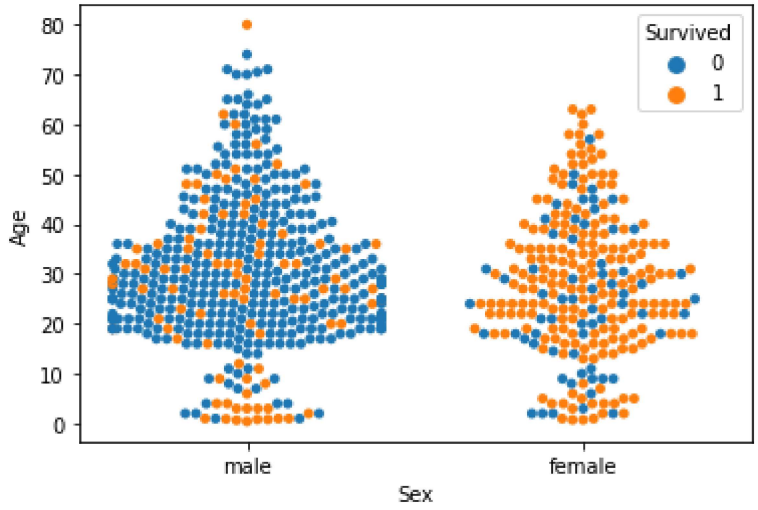
Out[12]:
```
<seaborn.axisgrid.FacetGrid at 0x7fc97d9108e0>
```



In [15]:
```
sns.swarmplot(x='Sex', y='Age', data=df, hue='Survived')
```

```
/home/pict/.local/lib/python3.8/site-packages/seaborn/categorical.py:1296: UserWarning: 5.9% of the points cannot be placed; you may want to decrease the size of the markers or use stripplot.
  warnings.warn(msg, UserWarning)
```

Out[15]:
```
<AxesSubplot:xlabel='Sex', ylabel='Age'>
```



In [16]:
```
sns.stripplot(x='Sex', y='Age', data=df, hue='Survived')
```

Out[16]: <AxesSubplot:xlabel='Sex', ylabel='Age'>