Part A Assignment_No_9

Data Visualization II

1. Use the inbuilt dataset 'titanic' as used in the above problem. Plot a box plot for distribution of age with respect to each gender along with the information about whether they survived or not. (Column names : 'sex' and 'age')
2. Write observations on the inference from the above statistics.

In [1]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
import warnings
warnings.filterwarnings('ignore')
dataset = sns.load_dataset('titanic')
dataset.head()
```

Out[1]:

	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 [5]:
```
dataset.shape
```

Out[5]:
```
(891, 15)
```

In [3]:
```
dataset.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 [6]:
```
dataset.describe()
```

Out[6]:

	survived	pclass	age	sibsp	parch	fare
count	891.000000	891.000000	714.000000	891.000000	891.000000	891.000000
mean	0.383838	2.308642	29.699118	0.523008	0.381594	32.204208
std	0.486592	0.836071	14.526497	1.102743	0.806057	49.693429
min	0.000000	1.000000	0.420000	0.000000	0.000000	0.000000
25%	0.000000	2.000000	20.125000	0.000000	0.000000	7.910400
50%	0.000000	3.000000	28.000000	0.000000	0.000000	14.454200
75%	1.000000	3.000000	38.000000	1.000000	0.000000	31.000000
max	1.000000	3.000000	80.000000	8.000000	6.000000	512.329200

In [7]:
```
dataset.describe(include='object')
```

Out[7]:

	sex	embarked	who	embark_town	alive
count	891	889	891	889	891
unique	2	3	3	3	2
top	male	S	man	Southampton	no
freq	577	644	537	644	549

In [9]:
```
dataset.isnull().sum()
```

Out[9]:
```
survived          0
pclass            0
sex               0
age             177
sibsp             0
parch             0
fare              0
embarked          2
class             0
who               0
adult_male        0
deck            688
embark_town       2
alive             0
alone             0
dtype: int64
```

In [12]:
```
dataset['age']=dataset['age'].fillna(np.mean(dataset['age']))
```

In [13]:
```
dataset['embarked']=dataset['embarked'].fillna(dataset['embarked'].mode()[0])
```

In [15]:
```
dataset['deck']=dataset['deck'].fillna(dataset['deck'].mode()[0])
```

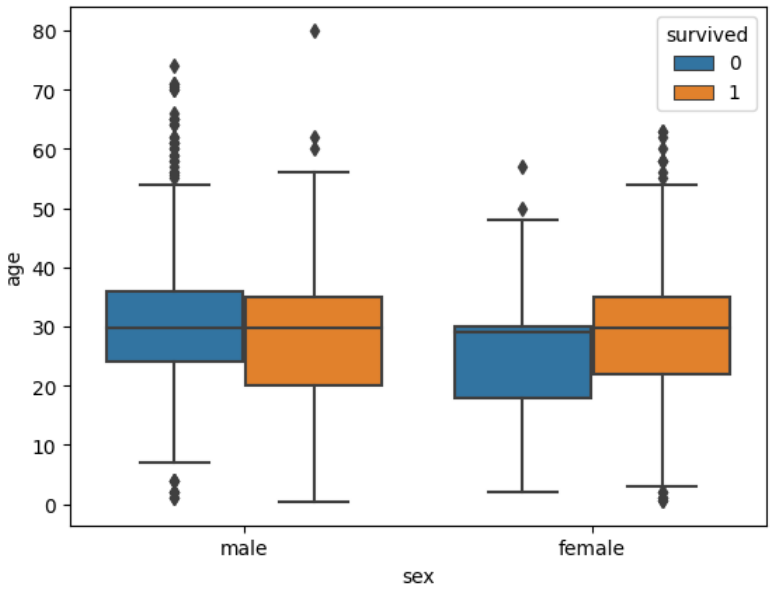
In [18]:
```
dataset['embark_town']=dataset['embark_town'].fillna(dataset['embark_town'].mode()[0])
```

In [19]:
```
dataset.isnull().sum()
```

Out[19]:
```
survived        0
pclass          0
sex             0
age             0
sibsp           0
parch           0
fare            0
embarked        0
class           0
who             0
adult_male      0
deck            0
embark_town     0
alive           0
alone           0
dtype: int64
```

In [20]:
```
sns.boxplot(x='sex', y='age', data=dataset, hue="survived")
```

Out[20]:
```
<Axes: xlabel='sex', ylabel='age'>
```



- If we want to see the box plots of forage of passengers of both genders, along with the information about whether or not they survived, we can pass the survived as value to the hue parameter.
- We can also see the distribution of the passengers who survived. For instance, we can see that among the male passengers, on average more younger people survived as compared to the older ones. Similarly, we can see that the variation among the age of female passengers who did not survive is much greater than the age of the surviving female passengers.