

day-15-22-data-analysis

May 26, 2025

```
[ ]: import pandas as pd
import requests
from bs4 import BeautifulSoup
import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt
```

#Day-15: Woriking with CSV

```
[ ]: import requests

url = "https://real-time-amazon-data.p.rapidapi.com/product-offers"

querystring = {"asin": "B09SM24S8C", "country": "US", "limit": "100", "page": "1"}

headers = {
    "x-rapidapi-key": "52e1a53c8dmsha81fec0e4811844p1c841bjasn8f57804d7039",
    "x-rapidapi-host": "real-time-amazon-data.p.rapidapi.com"
}

response = requests.get(url, headers=headers, params=querystring)

print(response.json())
```

```
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Carrier': 'Unlocked'}, 'customers_say': "Customers find the phone works well, is easy to set up, and offers good value for money. However, the phone's unlockability is a concern as many report it's not unlocked for Xfinity. Moreover, the device receives mixed feedback about its battery life, with some saying it lasts while others report it doesn't last long. Additionally, several customers mention issues with the phone being damaged with scratches on the screen.", 'delivery': 'FREE delivery May 7 - 8 to 10001. Details Or fastest delivery Tuesday, May 6. Details', 'primary_delivery_time': 'May 7 - 8', 'category': {'id': 'aps', 'name': 'All Departments'}, 'category_path': [{'id': '2335752011', 'name': 'Cell Phones & Accessories', 'link': 'https://www.amazon.com/cell-phones-service-plans-accessories/b/ref=dp_bc_1?ie=UTF8&node=2335752011'}, {'id': '7072561011', 'name': 'Cell Phones', 'link': 'https://www.amazon.com/cell-phone-devices/b/ref=dp_bc_2?ie=UTF8&node=7072561011'}], 'product_variations_dimensions': ['color', 'size'], 'product_variations': [], 'all_product_variations': {'B09VXCQGNP': {'color': 'Blue', 'size': '32GB'}, 'B09SM24S8C': {'color': 'Black', 'size': '32GB'}}, 'has_aplus': False, 'has_brandstory': False, 'product_offers': [{'product_price': '\$69.44', 'product_original_price': None, 'product_condition': 'Refurbished - Excellent', 'ships_from': 'Stalion ReQuip', 'seller': 'Stalion ReQuip', 'seller_id': 'A3JRDLHDHLEV86Q', 'seller_link': 'https://www.amazon.com/gp/aag/main?ie=UTF8&seller=A3JRDLHDHLEV86Q&isAmazonFulfilled=0&asin=B09SM24S8C&ref=olp_merch_name_0', 'seller_star_rating': '4.5', 'seller_star_rating_info': '(1573 ratings)\n93% positive over last 12 months', 'currency': 'USD', 'delivery_price': 'FREE', 'delivery_time': 'May 7 - 8'}, {'product_price': '\$59.00', 'product_original_price': '\$71.95', 'product_condition': 'Refurbished - Good', 'ships_from': 'Amazon.com', 'seller': 'Techrific Deals', 'seller_id': 'AXDQETSB4MUQT', 'seller_link': 'https://www.amazon.com/gp/aag/main?ie=UTF8&seller=AXDQETSB4MUQT&isAmazonFulfilled=1&asin=B09SM24S8C&ref=olp_merch_name_1', 'seller_star_rating': '4.5', 'seller_star_rating_info': '(863 ratings)\n85% positive over last 12 months', 'currency': 'USD', 'delivery_price': 'FREE', 'delivery_time': 'Friday, May 9'}, {'product_price': '\$69.44', 'product_original_price': None, 'product_condition': 'Refurbished - Excellent', 'ships_from': 'ElectroDealz LLC', 'seller': 'ElectroDealz LLC', 'seller_id': 'A3JG8D8JJ07VSC', 'seller_link': 'https://www.amazon.com/gp/aag/main?ie=UTF8&seller=A3JG8D8JJ07VSC&isAmazonFulfilled=0&asin=B09SM24S8C&ref=olp_merch_name_2', 'seller_star_rating': '4', 'seller_star_rating_info': '(161 ratings)\n74% positive over last 12 months', 'currency': 'USD', 'delivery_price': 'FREE', 'delivery_time': 'May 9 - 15'}, {'product_price': '\$74.99', 'product_original_price': None, 'product_condition': 'Refurbished - Excellent', 'ships_from': 'Amazon.com', 'seller': 'BesTechDeal', 'seller_id': 'A10FNH7X27CXTU', 'seller_link': 'https://www.amazon.com/gp/aag/main?ie=UTF8&seller=A10FNH7X27CXTU&isAmazonFulfilled=1&asin=B09SM24S8C&ref=olp_merch_name_3', 'seller_star_rating': '4.5', 'seller_star_rating_info': '(553 ratings)\n93% positive over last 12 months', 'currency': 'USD', 'delivery_price': 'FREE', 'delivery_time': 'Friday, May 9'}, {'product_price': '\$74.99', 'product_original_price': None, 'product_condition': 'Refurbished - Excellent', 'ships_from': 'Amazon.com', 'seller': 'Techrific Deals', 'seller_id':

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```
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```

```
[ ]: import pandas as pd
      pd.DataFrame(response.json())
```

```
[ ]:
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country         OK  18ae4005-c15c-4645-a7a9-eb0f0b20fd72
limit           OK  18ae4005-c15c-4645-a7a9-eb0f0b20fd72
page            OK  18ae4005-c15c-4645-a7a9-eb0f0b20fd72
product_title   OK  18ae4005-c15c-4645-a7a9-eb0f0b20fd72
product_price   OK  18ae4005-c15c-4645-a7a9-eb0f0b20fd72
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product_photo   OK  18ae4005-c15c-4645-a7a9-eb0f0b20fd72
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product_information OK  18ae4005-c15c-4645-a7a9-eb0f0b20fd72
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user_uploaded_videos OK  18ae4005-c15c-4645-a7a9-eb0f0b20fd72
has_video       OK  18ae4005-c15c-4645-a7a9-eb0f0b20fd72
product_details OK  18ae4005-c15c-4645-a7a9-eb0f0b20fd72
customers_say   OK  18ae4005-c15c-4645-a7a9-eb0f0b20fd72
delivery        OK  18ae4005-c15c-4645-a7a9-eb0f0b20fd72
primary_delivery_time OK  18ae4005-c15c-4645-a7a9-eb0f0b20fd72
category        OK  18ae4005-c15c-4645-a7a9-eb0f0b20fd72
category_path   OK  18ae4005-c15c-4645-a7a9-eb0f0b20fd72
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```

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all_product_variations	OK	18ae4005-c15c-4645-a7a9-eb0f0b20fd72
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has_brandstory	OK	18ae4005-c15c-4645-a7a9-eb0f0b20fd72
product_offers	OK	18ae4005-c15c-4645-a7a9-eb0f0b20fd72

	parameters	\
asin	B09SM24S8C	
country	US	
limit	100	
page	1	
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product_price	NaN	
product_original_price	NaN	
product_price_max	NaN	
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product_star_rating	NaN	
product_num_ratings	NaN	
product_url	NaN	
product_slug	NaN	
product_photo	NaN	
product_num_offers	NaN	
product_availability	NaN	
is_best_seller	NaN	
is_amazon_choice	NaN	
is_prime	NaN	
climate_pledge_friendly	NaN	
sales_volume	NaN	
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product_description	NaN	
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has_video	NaN	
product_details	NaN	
customers_say	NaN	
delivery	NaN	
primary_delivery_time	NaN	
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category_path	NaN	
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product_variations	NaN	

all_product_variations	NaN
has_aplus	NaN
has_brandstory	NaN
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country	US
limit	NaN
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currency	USD
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product_byline_links	[https://www.amazon.com/Amazon-Renewed/b/ref=b...
product_star_rating	3.9
product_num_ratings	1253
product_url	https://www.amazon.com/dp/B09SM24S8C
product_slug	Samsung-Unlocked-Smartphone-Expandable-Infinite
product_photo	https://m.media-amazon.com/images/I/51m45B3Yy+...
product_num_offers	15
product_availability	In Stock
is_best_seller	False
is_amazon_choice	False
is_prime	True
climate_pledge_friendly	False
sales_volume	1K+ bought in past month
about_product	[AT&T Unlocked (Will Not work on CDMA Carrier)]
product_description	This pre-owned or refurbished product has been...
product_information	{'Product Dimensions': '6.46 x 2.99 x 0.36 inc...
rating_distribution	{'1': 16, '2': 4, '3': 10, '4': 14, '5': 56}
product_photos	[https://m.media-amazon.com/images/I/51m45B3Yy...
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has_video	False
product_details	{'Brand': 'SAMSUNG', 'Operating System': 'Andr...
customers_say	Customers find the phone works well, is easy t...
delivery	FREE delivery May 7 - 8 to 10001. Details Or f...
primary_delivery_time	May 7 - 8
category	{'id': 'aps', 'name': 'All Departments'}
category_path	[{'id': '2335752011', 'name': 'Cell Phones & A...
product_variations_dimensions	[color, size]
product_variations	[]
all_product_variations	{'B09VXCQGNP': {'color': 'Blue', 'size': '32GB...

```
has_aplus False
has_brandstory False
product_offers [{'product_price': '$69.44', 'product_original...
```

```
[ ]:
```

```
#Web Scripping for data
```

```
[ ]: youtube=requests.get('https://www.daraz.com.bd/#hp-just-for-you').text
```

```
[ ]: soup=BeautifulSoup(youtube,'lxml')
```

```
[ ]: commenter=soup.find_all('div',class_='card-jfy-item-desc')
```

```
[ ]: len(commenter)
```

```
[ ]: 24
```

```
[ ]: for i in commenter:
      name=i.find('div',class_='card-jfy-title two-line-clamp')
      print(name)
```

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None
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[ ]:
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```
#Understanding Data part-2 EDA Day-20(Univariant)
```

```
[ ]:
```

```
#import Titanic dataset
titanic=pd.read_csv('/content/Titanic-Dataset.csv')
titanic
```

```
[ ]:
```

```
PassengerId  Survived  Pclass  \
0             1         0       3
1             2         1       1
2             3         1       3
3             4         1       1
4             5         0       3
..          ...      ...     ...
886          887         0       2
887          888         1       1
888          889         0       3
889          890         1       1
890          891         0       3
```

```
                                Name    Sex  Age  SibSp  \
0                        Braund, Mr. Owen Harris    male  22.0      1
1  Cumings, Mrs. John Bradley (Florence Briggs Th...  female  38.0      1
2                        Heikkinen, Miss. Laina    female  26.0      0
3  Futrelle, Mrs. Jacques Heath (Lily May Peel)    female  35.0      1
4                        Allen, Mr. William Henry    male  35.0      0
..          ...      ...     ...     ...
886                        Montvila, Rev. Juozas    male  27.0      0
887                        Graham, Miss. Margaret Edith  female  19.0      0
888      Johnston, Miss. Catherine Helen "Carrie"    female   NaN      1
889                        Behr, Mr. Karl Howell    male  26.0      0
890                        Dooley, Mr. Patrick    male  32.0      0
```

```
    Parch    Ticket    Fare Cabin Embarked
0       0  A/5 21171    7.2500   NaN        S
1       0    PC 17599   71.2833   C85        C
2       0  STON/O2. 3101282    7.9250   NaN        S
3       0    113803   53.1000  C123        S
4       0    373450    8.0500   NaN        S
..    ...      ...     ...     ...
886     0    211536   13.0000   NaN        S
887     0    112053   30.0000  B42        S
888     2  W./C. 6607   23.4500   NaN        S
889     0    111369   30.0000  C148        C
890     0    370376    7.7500   NaN        Q
```

[891 rows x 12 columns]

```
[ ]: titanic.corr(numeric_only=True)
```

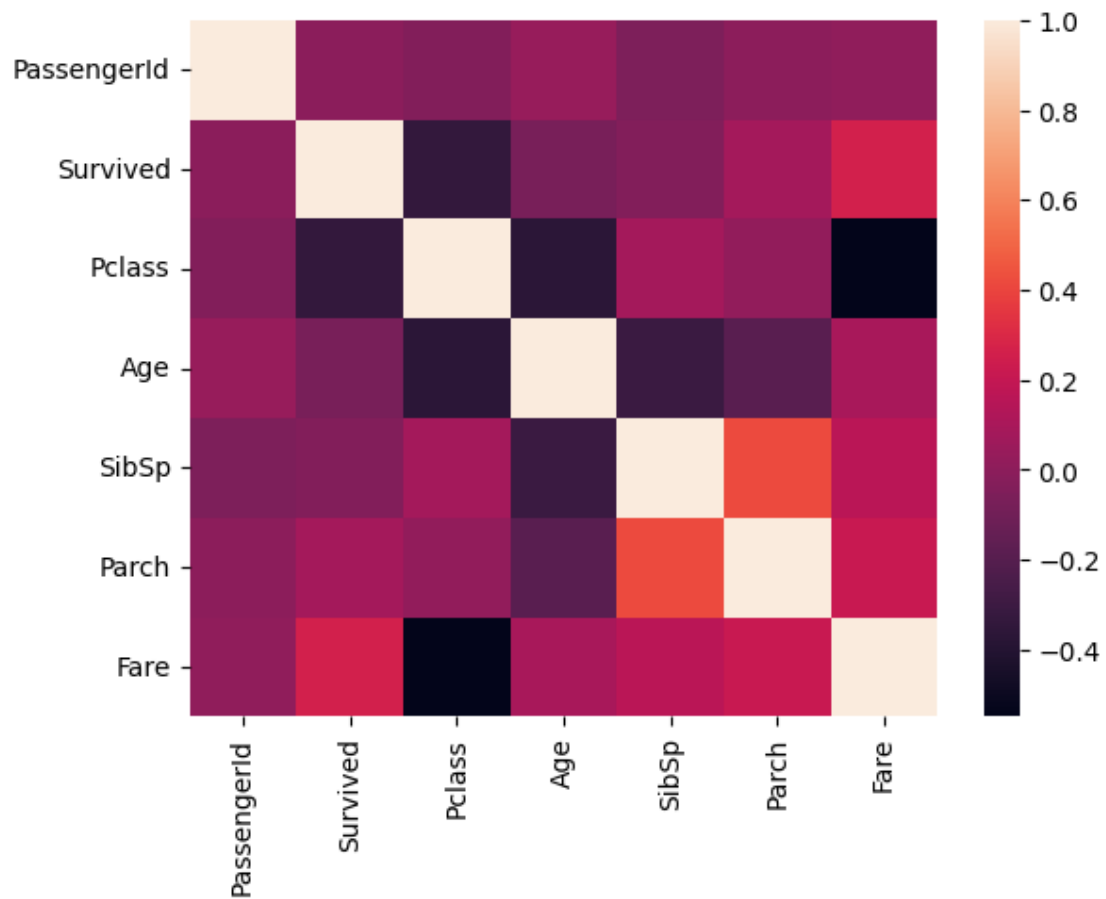
```
[ ]:
      PassengerId  Survived  Pclass     Age  SibSp  Parch  \
PassengerId      1.000000 -0.005007 -0.035144  0.036847 -0.057527 -0.001652
Survived          -0.005007  1.000000 -0.338481 -0.077221 -0.035322  0.081629
Pclass            -0.035144 -0.338481  1.000000 -0.369226  0.083081  0.018443
Age                0.036847 -0.077221 -0.369226  1.000000 -0.308247 -0.189119
SibSp              -0.057527 -0.035322  0.083081 -0.308247  1.000000  0.414838
Parch             -0.001652  0.081629  0.018443 -0.189119  0.414838  1.000000
Fare               0.012658  0.257307 -0.549500  0.096067  0.159651  0.216225
```

```

      Fare
PassengerId  0.012658
Survived      0.257307
Pclass       -0.549500
Age           0.096067
SibSp         0.159651
Parch         0.216225
Fare          1.000000
```

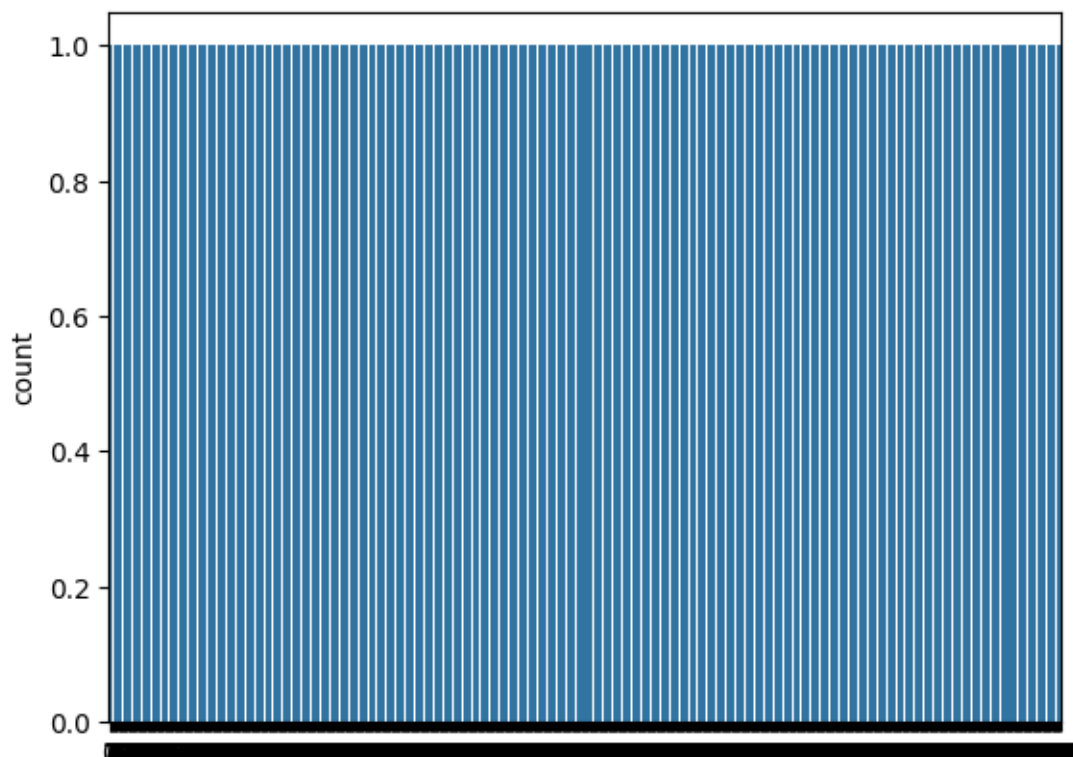
```
[ ]: sns.heatmap(titanic.corr(numeric_only=True))
```

```
[ ]: <Axes: >
```



```
[ ]: sns.countplot(titanic['Pclass'])
```

```
[ ]: <Axes: ylabel='count'>
```

```
[ ]: titanic.sample(3)
```

```
[ ]:      PassengerId  Survived  Pclass  \
25           26         1         3
397          398         0         2
270          271         0         1
```

```

                                Name      Sex  Age  SibSp  \
25  Asplund, Mrs. Carl Oscar (Selma Augusta Emilia...  female  38.0      1
397                                McKane, Mr. Peter David    male  46.0      0
270                                Cairns, Mr. Alexander    male   NaN      0
```

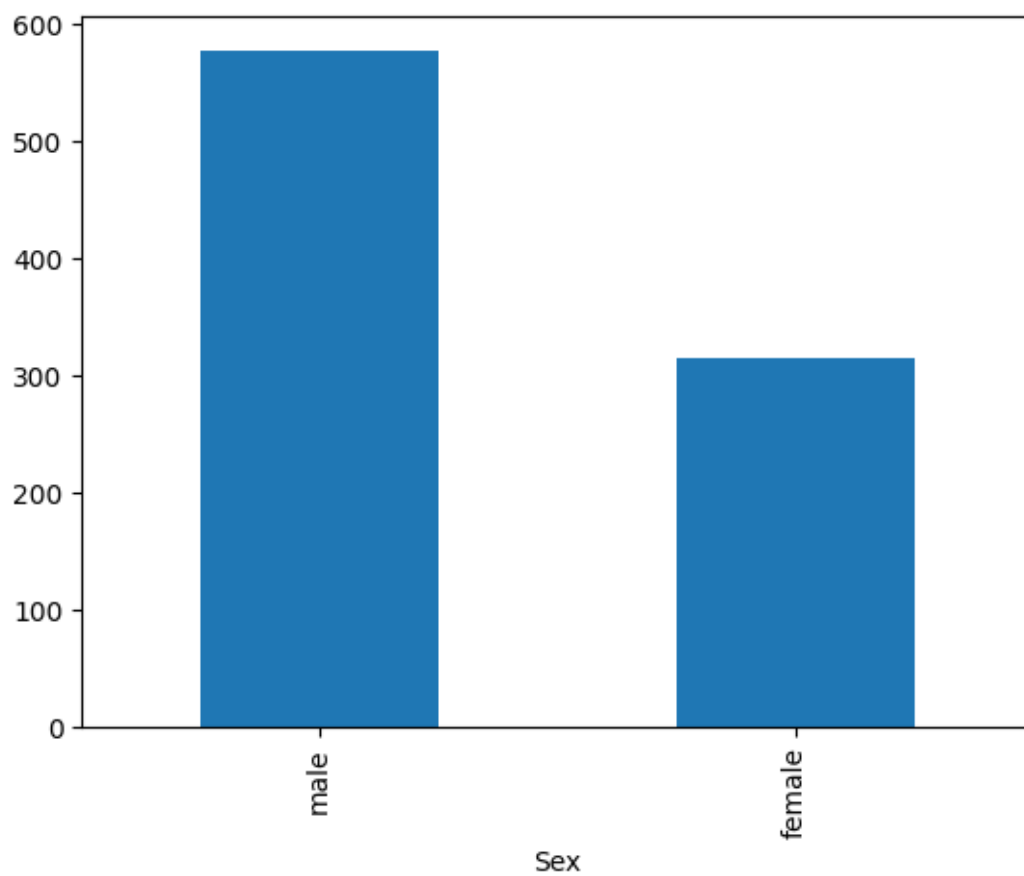
```

      Parch  Ticket      Fare Cabin Embarked
25         5  347077  31.3875   NaN        S
397         0  28403  26.0000   NaN        S
270         0  113798  31.0000   NaN        S
```

```
#visulization
```

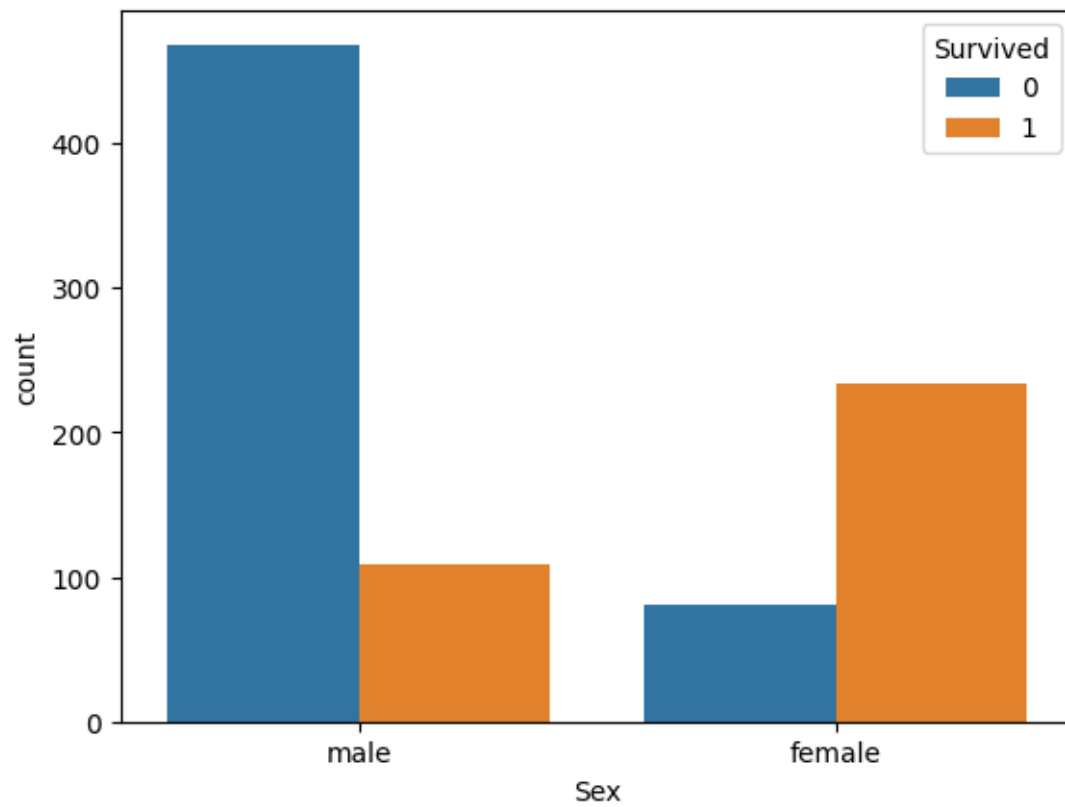
```
[ ]: #number of male and Female
titanic['Sex'].value_counts().plot(kind='bar')
```

```
[ ]: <Axes: xlabel='Sex'>
```



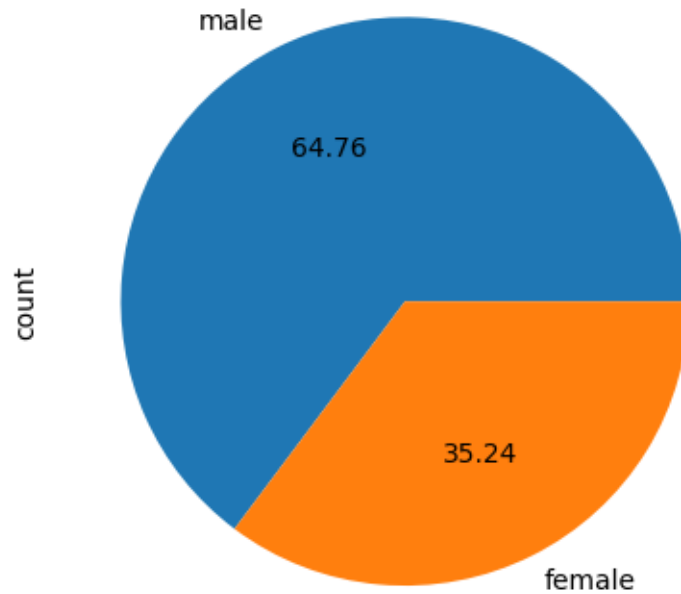
```
[ ]: #how many male and female survived based on Gender?  
sns.countplot(data=titanic,x='Sex',hue='Survived')
```

```
[ ]: <Axes: xlabel='Sex', ylabel='count'>
```



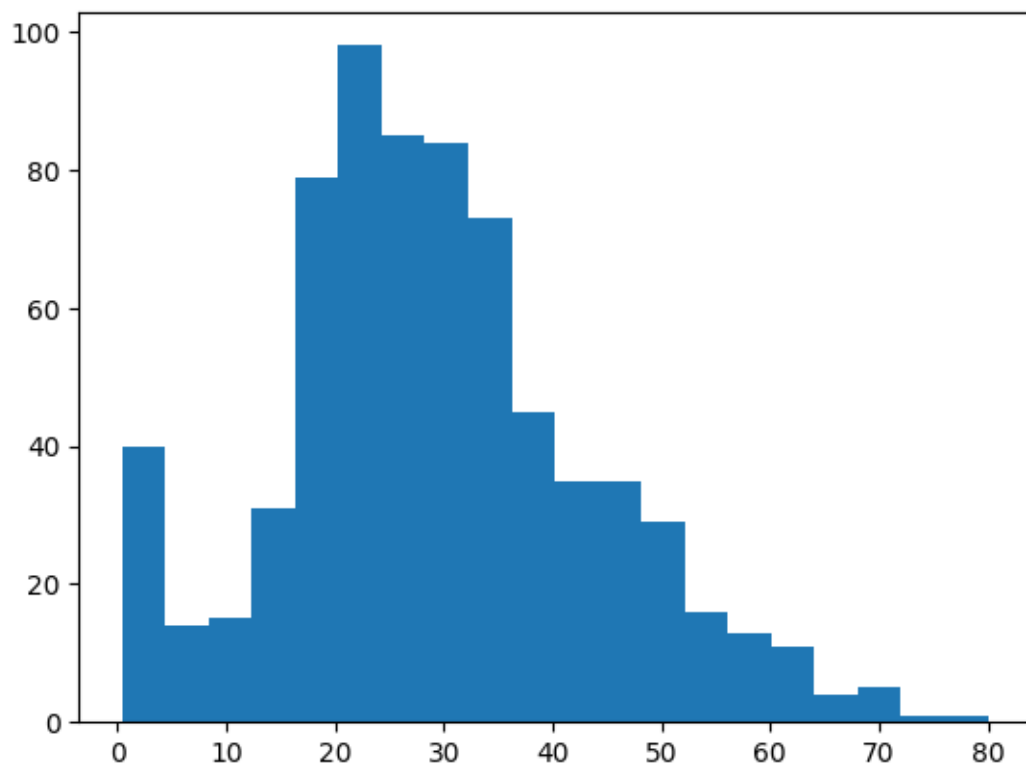
```
[ ]: titanic['Sex'].value_counts().plot(kind='pie', autopct='%0.2f')
```

```
[ ]: <Axes: ylabel='count'>
```



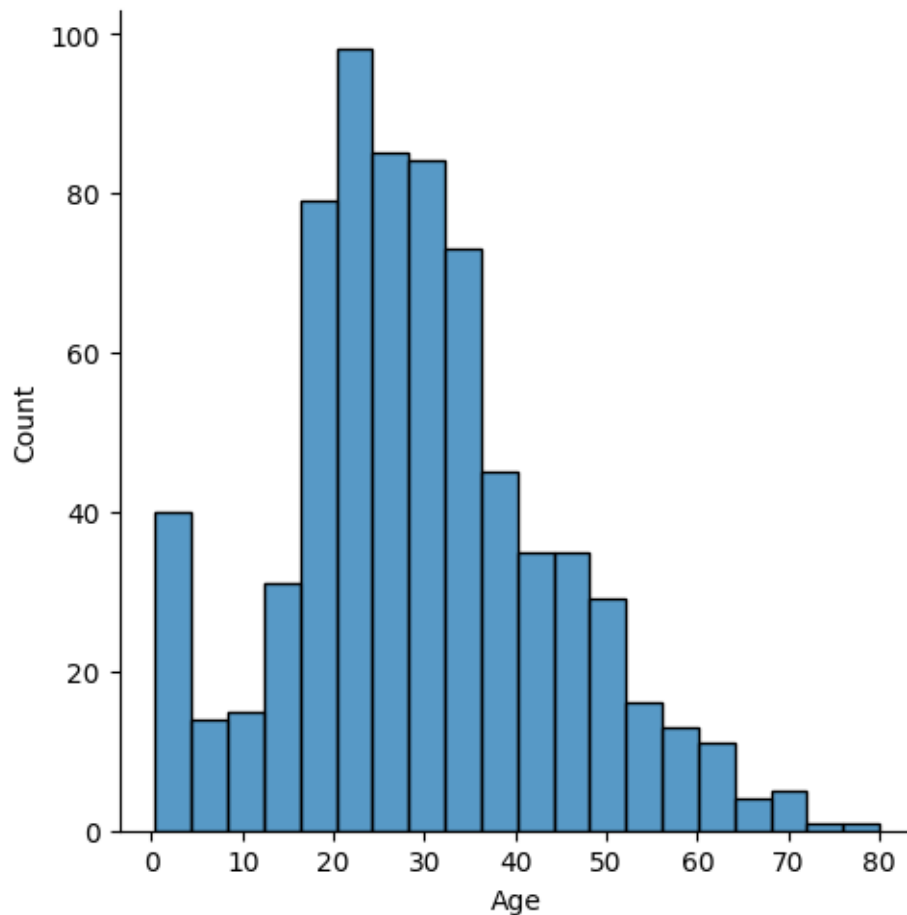
```
[ ]: #Histogram can convert continious numerical into number Catagorical value using
      ↪bins
      #it represent Frequency of value
      #Which ages pepole was triveled in Titanic?
      plt.hist(titanic['Age'],bins=20)
```

```
[ ]: (array([40., 14., 15., 31., 79., 98., 85., 84., 73., 45., 35., 35., 29.,
            16., 13., 11.,  4.,  5.,  1.,  1.]),
      array([ 0.42 ,  4.399,  8.378, 12.357, 16.336, 20.315, 24.294, 28.273,
            32.252, 36.231, 40.21 , 44.189, 48.168, 52.147, 56.126, 60.105,
            64.084, 68.063, 72.042, 76.021, 80.   ]),
      <BarContainer object of 20 artists>)
```



```
[ ]: sns.displot(titanic['Age'])
```

```
[ ]: <seaborn.axisgrid.FacetGrid at 0x7d64719d25d0>
```



```
[ ]: sns.distplot(titanic['Age'])
      #distirbution plot shows probability/Density of values.
      #10y age ar baccha hower probability koto?==0.005
```

<ipython-input-21-44a887c2b8c9>:1: UserWarning:

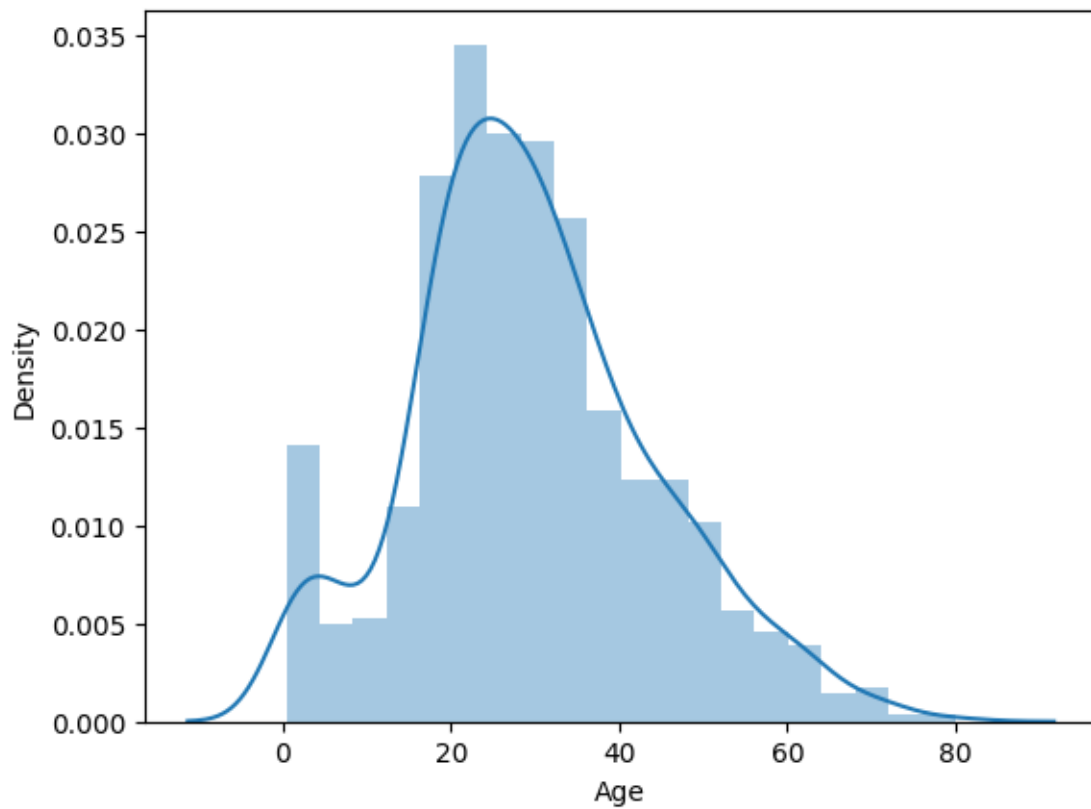
`distplot` is a deprecated function and will be removed in seaborn v0.14.0.

Please adapt your code to use either `displot` (a figure-level function with similar flexibility) or `histplot` (an axes-level function for histograms).

For a guide to updating your code to use the new functions, please see <https://gist.github.com/mwaskom/de44147ed2974457ad6372750bbe5751>

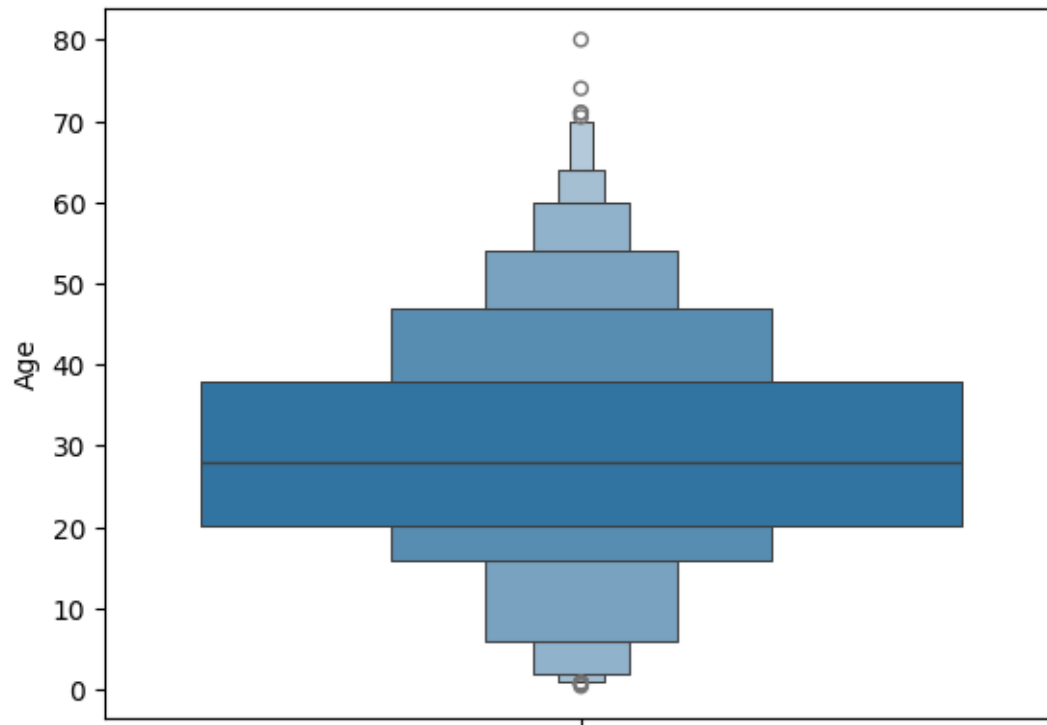
```
sns.distplot(titanic['Age'])
```

```
[ ]: <Axes: xlabel='Age', ylabel='Density'>
```



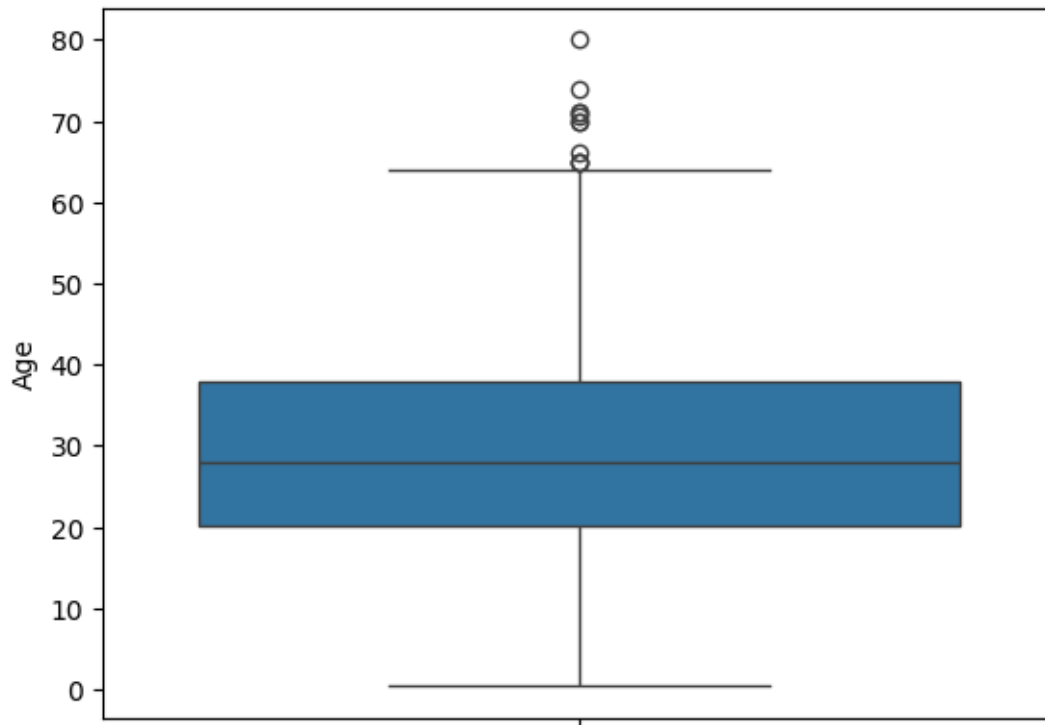
```
[ ]: #Boxplot shows Outliers of Value(means kon value golo anomaly ar moto kaj
      ↪kortase ,oi value golo chile bad dia jabe )
      #aikhane age=70 ar opor ar age golo anomaly ar moto kaj kortase(outlier)
      sns.boxenplot(titanic['Age'])
```

```
[ ]: <Axes: ylabel='Age'>
```



```
[ ]: #Boxplot shows Outliers of Value(means kon value golo anomaly ar moto kaj
      ↪ kortase ,oi value golo chile bad dia jabe )
      #aikhane age=60 ar opor ar age golo anomaly ar moto kaj kortase(outlier)
      sns.boxplot(titanic['Age'])
```

```
[ ]: <Axes: ylabel='Age'>
```

```
[ ]: titanic['Age'].min()
```

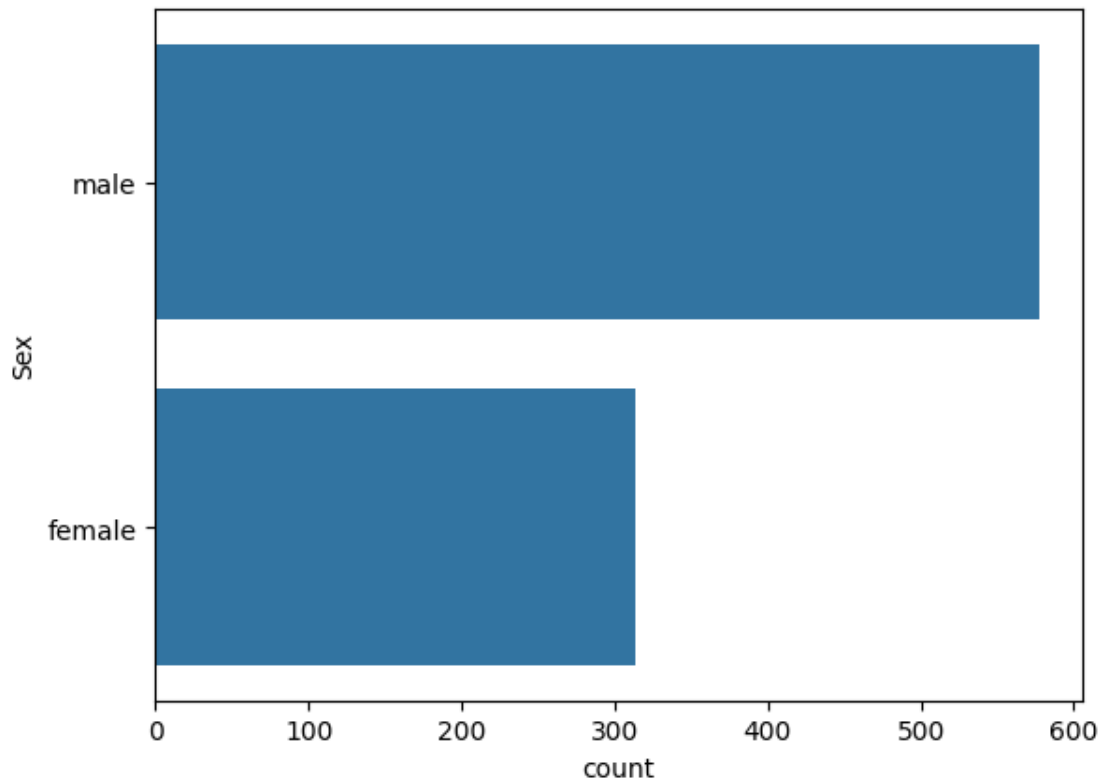
```
[ ]: 0.42
```

```
[ ]: titanic['Sex'].value_counts()
```

```
[ ]: Sex
     male      577
     female   314
     Name: count, dtype: int64
```

```
[ ]: sns.countplot(titanic['Sex'],)
```

```
[ ]: <Axes: xlabel='count', ylabel='Sex'>
```



```
[ ]: x = divmod(14, 5)
      x
```

```
[ ]: (2, 4)
```

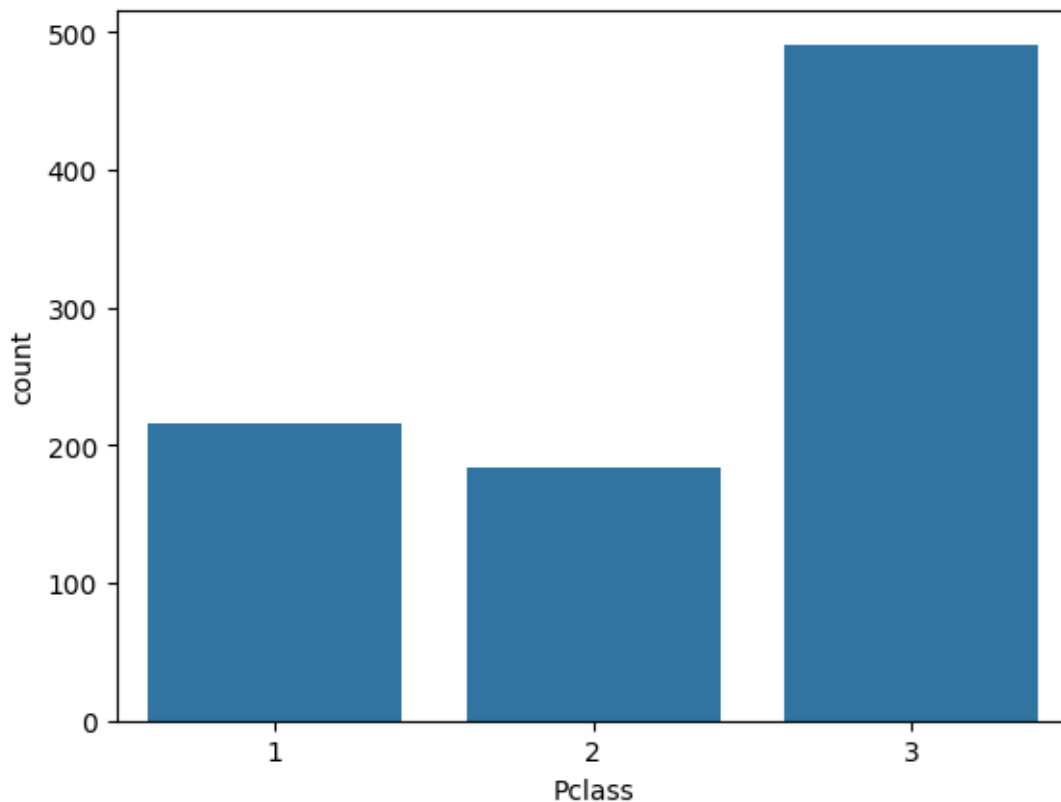
```
[ ]: tc=titanic
```

```
[ ]: tc.sample(3)
```

```
[ ]:
      PassengerId  Survived  Pclass
363            364         0       3
59              60         0       3  Goodwin, Master. William Frederick
118            119         0       1    Baxter, Mr. Quigg Edmond
                                     Name  Sex  \
363            35.0      0      0  SOTON/O.Q. 3101310    7.0500    NaN    S
59             11.0      5      2      CA 2144    46.9000    NaN    S
118            24.0      0      1      PC 17558   247.5208   B58 B60    C
```

```
[ ]: sns.countplot(x=tc['Pclass'])
      # sns.countplot(tc['Pclass'])# ata dile hocce na
```

```
[ ]: <Axes: xlabel='Pclass', ylabel='count'>
```



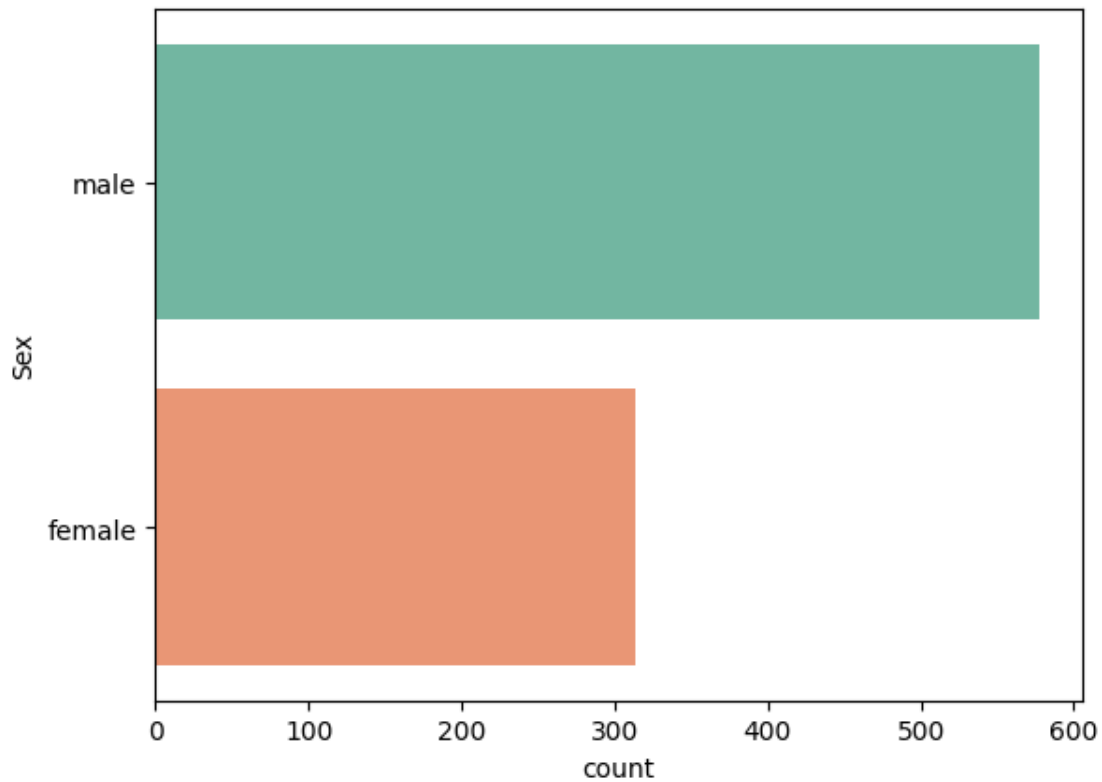
```
[ ]: sns.countplot(y='Sex', data=tc, palette='Set2')
```

<ipython-input-31-62dabc5444d6>:1: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed in v0.14.0. Assign the `y` variable to `hue` and set `legend=False` for the same effect.

```
sns.countplot(y='Sex', data=tc, palette='Set2')
```

```
[ ]: <Axes: xlabel='count', ylabel='Sex'>
```



```
[ ]:
```

```
#uni veriant Analysis in Agriculature dataset
```

```
[ ]: ag=pd.read_csv('/content/fertilizer_recommendation_dataset.csv')
      ag
```

```
[ ]:
      Temperature  Moisture  Rainfall  PH  Nitrogen  Phosphorous  \
0      50.179845  0.725893  205.600816  6.227358  66.701872    76.963560
1      21.633318  0.721958  306.081601  7.173131  71.583316   163.057636
2      23.060964  0.685751  259.336414  7.380793  75.709830    62.091508
3      26.241975  0.755095  212.703513  6.883367  78.033687   151.012521
4      21.490157  0.730672  268.786767  7.578760  71.765123    66.257371
...      ...      ...      ...      ...      ...      ...
3095    23.486430  0.531191  46.412228  6.733584  56.534283   146.111078
3096    24.289508  0.736699  63.068103  6.372709  56.358005    49.003277
3097    23.945488  0.520513  41.344590  7.051515  55.738905   148.567285
3098    26.368604  0.547436  33.106012  6.615922  57.711705    96.662953
3099    27.670724  0.558722  50.670082  8.828433  59.967605    78.787005

      Potassium  Carbon  Soil  Crop  \
0      96.429065  0.496300  Loamy Soil  rice
```

1	148.128347	1.234242	Loamy Soil	rice
2	80.308971	1.795650	Peaty Soil	rice
3	153.005712	1.517556	Loamy Soil	rice
4	97.000886	1.782985	Peaty Soil	rice
...
3095	81.389366	1.602913	Neutral Soil	watermelon
3096	46.695889	1.473656	Peaty Soil	watermelon
3097	90.057021	1.455045	Neutral Soil	watermelon
3098	59.531473	0.614487	Acidic Soil	watermelon
3099	45.327125	1.472728	Acidic Soil	watermelon

	Fertilizer \
0	Compost
1	Balanced NPK Fertilizer
2	Water Retaining Fertilizer
3	Balanced NPK Fertilizer
4	Organic Fertilizer
...	...
3095	Water Retaining Fertilizer
3096	DAP
3097	Water Retaining Fertilizer
3098	Compost
3099	Muriate of Potash

	Remark
0	Enhances organic matter and improves soil stru...
1	Provides a balanced mix of nitrogen, phosphoru...
2	Improves water retention in dry soils. Prefer ...
3	Provides a balanced mix of nitrogen, phosphoru...
4	Enhances fertility naturally, ideal for peaty ...
...	...
3095	Improves water retention in dry soils. Prefer ...
3096	Rich in phosphorus, essential for root develop...
3097	Improves water retention in dry soils. Prefer ...
3098	Enhances organic matter and improves soil stru...
3099	High potassium content, improves fruit and flo...

[3100 rows x 12 columns]

```
[ ]: ag.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 3100 entries, 0 to 3099
Data columns (total 12 columns):
#   Column          Non-Null Count  Dtype
---  -
0   Temperature     3100 non-null   float64
```

```

1  Moisture      3100 non-null  float64
2  Rainfall     3100 non-null  float64
3  PH           3100 non-null  float64
4  Nitrogen     3100 non-null  float64
5  Phosphorous  3100 non-null  float64
6  Potassium    3100 non-null  float64
7  Carbon       3100 non-null  float64
8  Soil         3100 non-null  object
9  Crop         3100 non-null  object
10 Fertilizer   3100 non-null  object
11 Remark       3100 non-null  object

```

dtypes: float64(8), object(4)

memory usage: 290.8+ KB

```
[ ]: ag.describe()
```

```

[ ]:
      Temperature      Moisture      Rainfall      PH      Nitrogen \
count  3100.000000  3100.000000  3100.000000  3100.000000  3100.000000
mean    27.271096    0.600763   111.024949    6.379775   61.278480
std      9.114450    0.144947    77.151880    0.957103   10.186410
min      4.011486    0.227436   -85.709593    3.448974   35.527718
25%     22.408505    0.493595    61.283985    5.860489   54.835715
50%     26.132938    0.599520    96.485935    6.337308   59.429649
75%     29.987887    0.708575   147.619401    6.899739   65.792790
max     56.653592    0.972361   411.955947    9.562341   98.581039

      Phosphorous      Potassium      Carbon
count  3100.000000  3100.000000  3100.000000
mean    69.582850    69.721167    1.474325
std     42.226712    35.304241    0.698300
min    -37.649739   -20.509108   -0.280560
25%     43.039260    49.992405    0.956401
50%     58.205269    58.710808    1.463357
75%     86.108983    76.318626    2.003534
max    177.314481   161.067982    3.241984

```

```
[ ]: ag.corr(numeric_only=True)
```

```

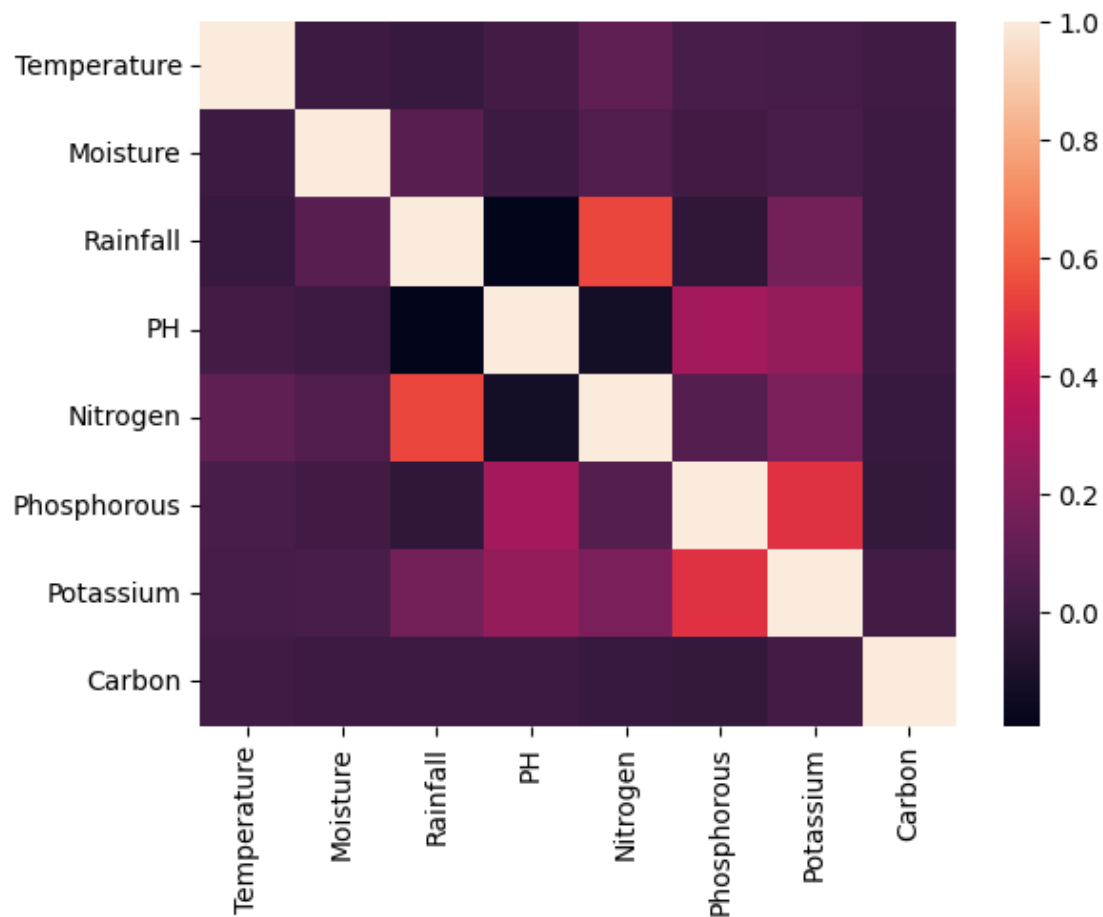
[ ]:
      Temperature      Moisture      Rainfall      PH      Nitrogen      Phosphorous \
Temperature      1.000000  -0.005550  -0.018700   0.020602   0.100776    0.036526
Moisture         -0.005550   1.000000   0.084949   0.001049   0.054807    0.015733
Rainfall         -0.018700   0.084949   1.000000  -0.193229   0.542018   -0.043352
PH               0.020602   0.001049  -0.193229   1.000000  -0.129813    0.288264
Nitrogen         0.100776   0.054807   0.542018  -0.129813   1.000000    0.068496
Phosphorous      0.036526   0.015733  -0.043352   0.288264   0.068496    1.000000
Potassium        0.023660   0.037123   0.156827   0.249605   0.179442    0.482775
Carbon           0.010123  -0.001971  -0.005136  -0.003100  -0.019814   -0.029635

```

	Potassium	Carbon
Temperature	0.023660	0.010123
Moisture	0.037123	-0.001971
Rainfall	0.156827	-0.005136
PH	0.249605	-0.003100
Nitrogen	0.179442	-0.019814
Phosphorous	0.482775	-0.029635
Potassium	1.000000	0.019474
Carbon	0.019474	1.000000

```
[ ]: sns.heatmap(ag.corr(numeric_only=True))
```

```
[ ]: <Axes: >
```



```
[ ]: ag.sample()
```

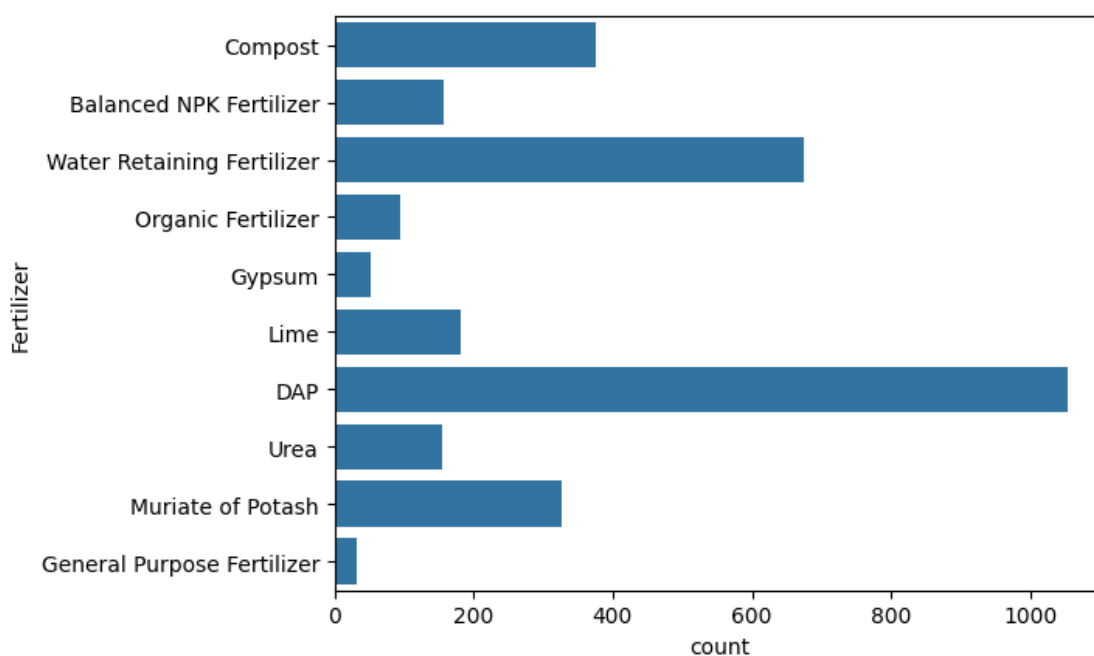
```
[ ]:      Temperature  Moisture  Rainfall      PH  Nitrogen  Phosphorous  \
2615      4.011486  0.405168  14.934805  6.055424  35.527718    63.487209

      Potassium    Carbon      Soil      Crop Fertilizer  \
2615  51.896631  2.192186  Acidic Soil  muskmelon      Urea

      Remark
2615  Provides high nitrogen, ideal for rapid leafy ...
```

```
[ ]: sns.countplot(y=ag['Fertilizer'])
```

```
[ ]: <Axes: xlabel='count', ylabel='Fertilizer'>
```



```
[ ]: ag.shape
```

```
[ ]: (3100, 12)
```

```
[ ]:
```

```
#Bi and Multi variate Data Analysis ## 1.Numerical-numerical,2.Numerical-
Catagorical,3.Catagorical-Catagorical #Day 21 (most important)
```

```
[ ]: iris=sns.load_dataset('iris')
iris
```



```
[ ]:      sepal_length  sepal_width  petal_length  petal_width  species
0          5.1          3.5          1.4          0.2    setosa
1          4.9          3.0          1.4          0.2    setosa
2          4.7          3.2          1.3          0.2    setosa
3          4.6          3.1          1.5          0.2    setosa
4          5.0          3.6          1.4          0.2    setosa
..          ...          ...          ...          ...    ...
145         6.7          3.0          5.2          2.3  virginica
146         6.3          2.5          5.0          1.9  virginica
147         6.5          3.0          5.2          2.0  virginica
148         6.2          3.4          5.4          2.3  virginica
149         5.9          3.0          5.1          1.8  virginica
```

[150 rows x 5 columns]

```
[ ]: fly=sns.load_dataset('flights')
fly
```

```
[ ]:      year month  passengers
0    1949   Jan         112
1    1949   Feb         118
2    1949   Mar         132
3    1949   Apr         129
4    1949   May         121
..     ...   ...         ...
139  1960   Aug         606
140  1960   Sep         508
141  1960   Oct         461
142  1960   Nov         390
143  1960   Dec         432
```

[144 rows x 3 columns]

```
[ ]: tips=sns.load_dataset(
      'tips'
)
tips
```

```
[ ]:      total_bill  tip    sex smoker  day    time  size
0         16.99  1.01  Female    No   Sun  Dinner    2
1         10.34  1.66   Male    No   Sun  Dinner    3
2         21.01  3.50   Male    No   Sun  Dinner    3
3         23.68  3.31   Male    No   Sun  Dinner    2
4         24.59  3.61  Female    No   Sun  Dinner    4
..          ...   ...   ...   ...   ...   ...   ...
239        29.03  5.92   Male    No   Sat  Dinner    3
240        27.18  2.00  Female   Yes   Sat  Dinner    2
```

241	22.67	2.00	Male	Yes	Sat	Dinner	2
242	17.82	1.75	Male	No	Sat	Dinner	2
243	18.78	3.00	Female	No	Thur	Dinner	2

[244 rows x 7 columns]

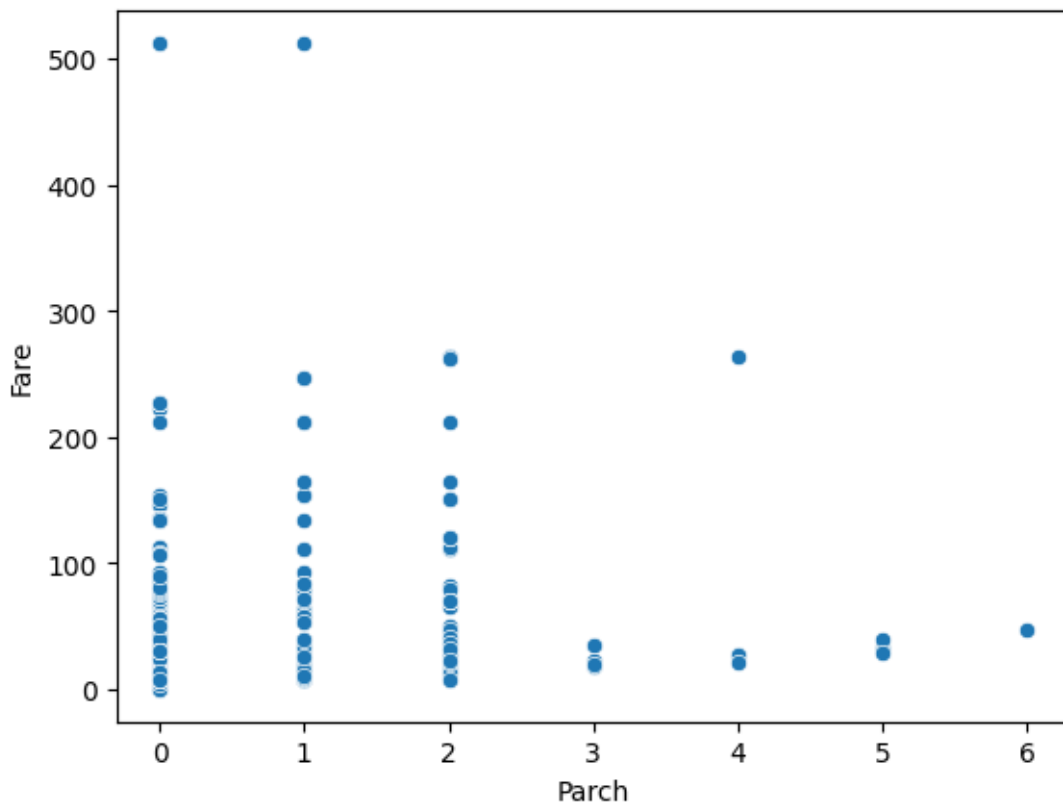
#Scatterplot to show relation between (number num/cat- num/cat) data

```
[ ]: titanic.columns
```

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

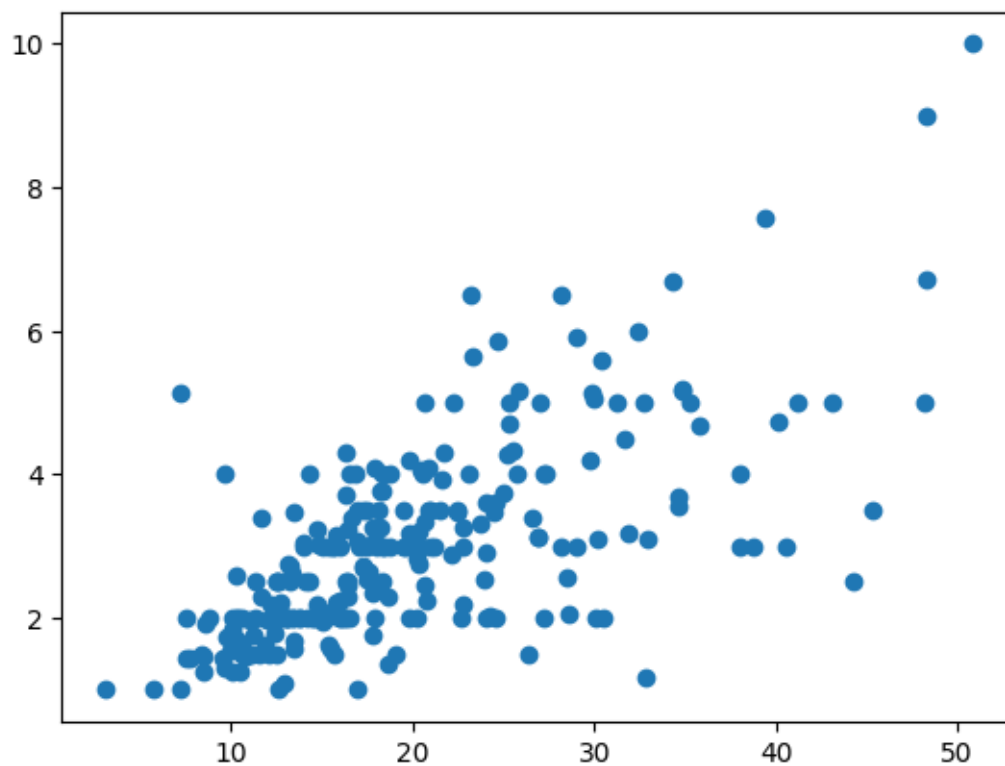
```
[ ]: sns.scatterplot(data=titanic,x='Parch',y='Fare')
```

```
[ ]: <Axes: xlabel='Parch', ylabel='Fare'>
```



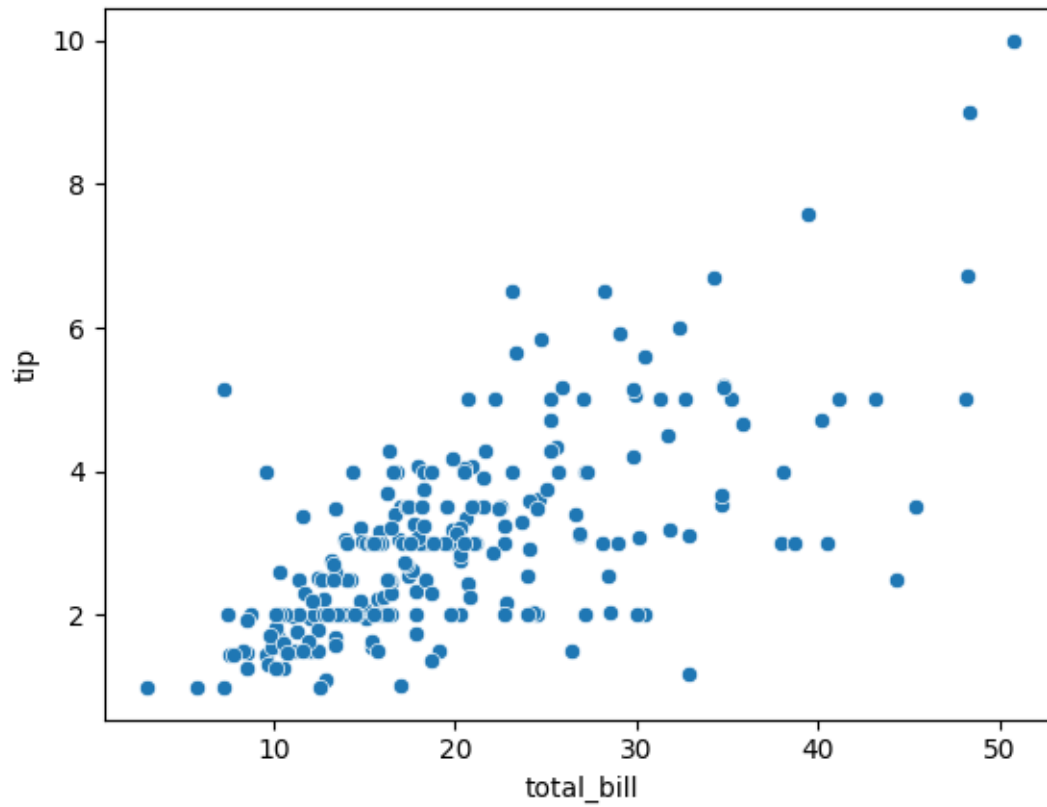
```
[ ]: #Scatterplot analysis (num-num)
plt.scatter(tips['total_bill'],tips['tip'])
```

```
[ ]: <matplotlib.collections.PathCollection at 0x7d646f72cd90>
```



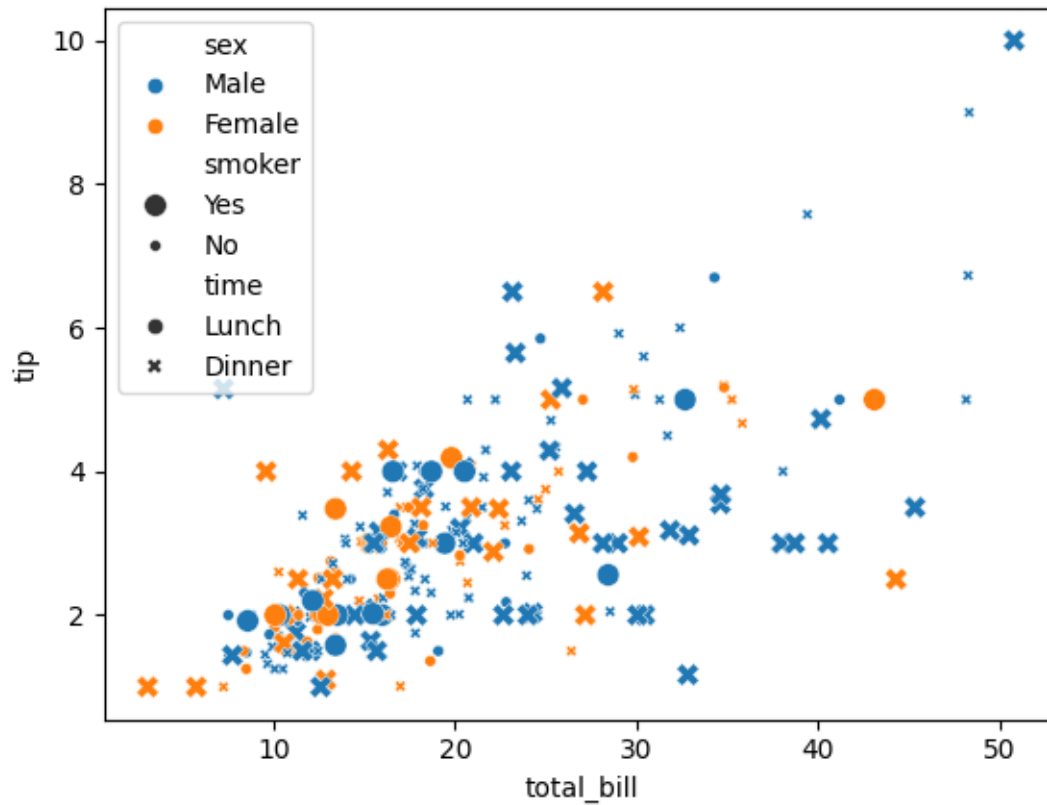
```
[ ]: sns.scatterplot(x=tips['total_bill'],y=tips['tip'])  
      #relation between bill vs tips ? =>kind of linear
```

```
[ ]: <Axes: xlabel='total_bill', ylabel='tip'>
```



```
[ ]: sns.  
      ↪scatterplot(x=tips['total_bill'],y=tips['tip'],hue=tips['sex'],style=tips['time'],size=tips
```

```
[ ]: <Axes: xlabel='total_bill', ylabel='tip'>
```

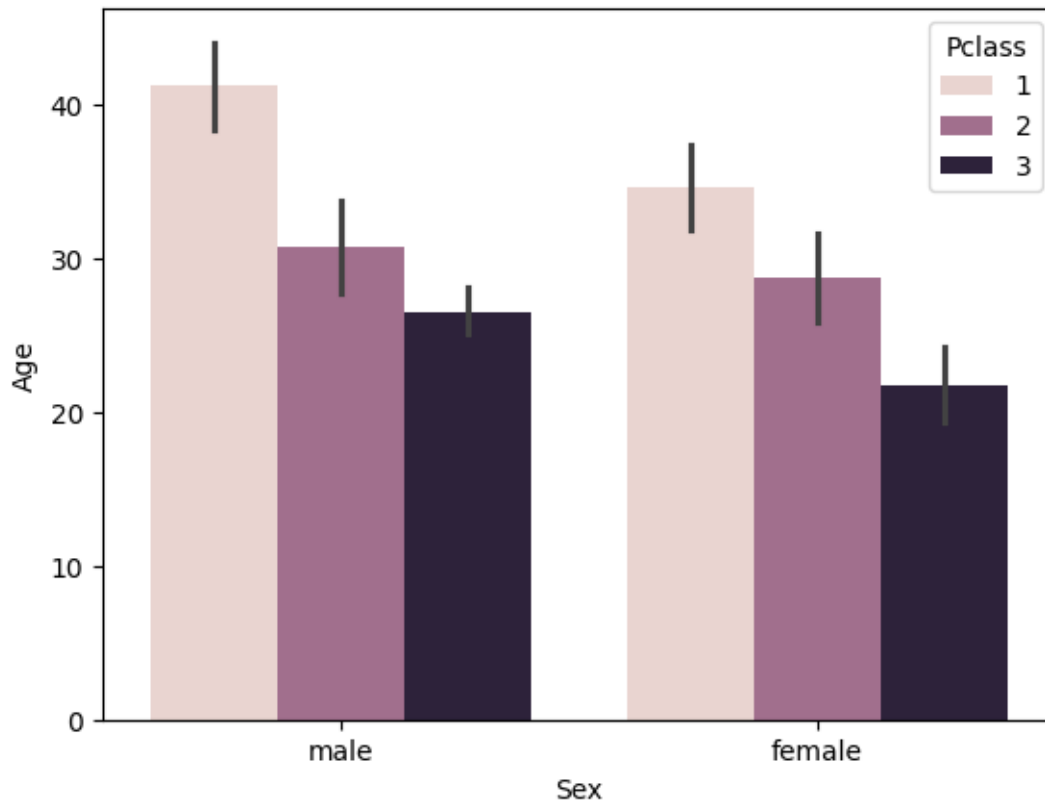


#Barplot(num-cat) ##to show Average value of (Cat-Numerical)

```
[ ]: ti=titanic
```

```
[ ]: sns.barplot(data=ti,x='Sex',y='Age',hue=ti['Pclass'])
      #prottok class a avg age koto cilo
```

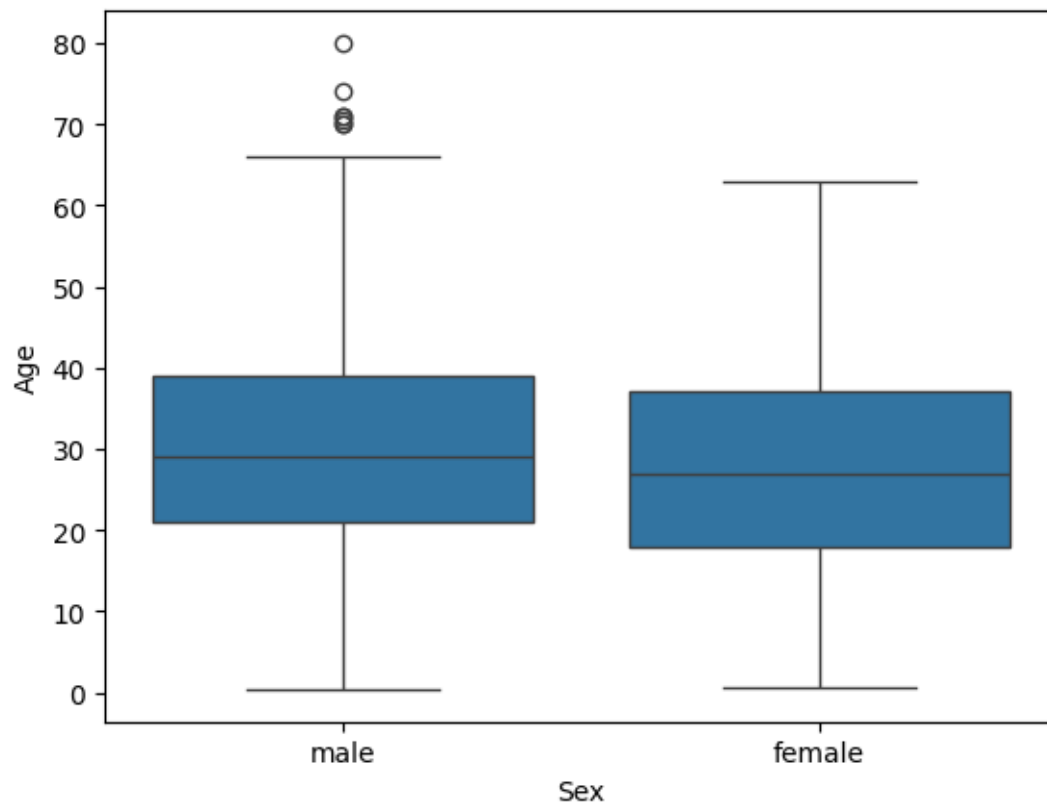
```
[ ]: <Axes: xlabel='Sex', ylabel='Age'>
```



#Boxplot(num-cat) ##to Show outliers of continious Nnumerical vs Catagorical

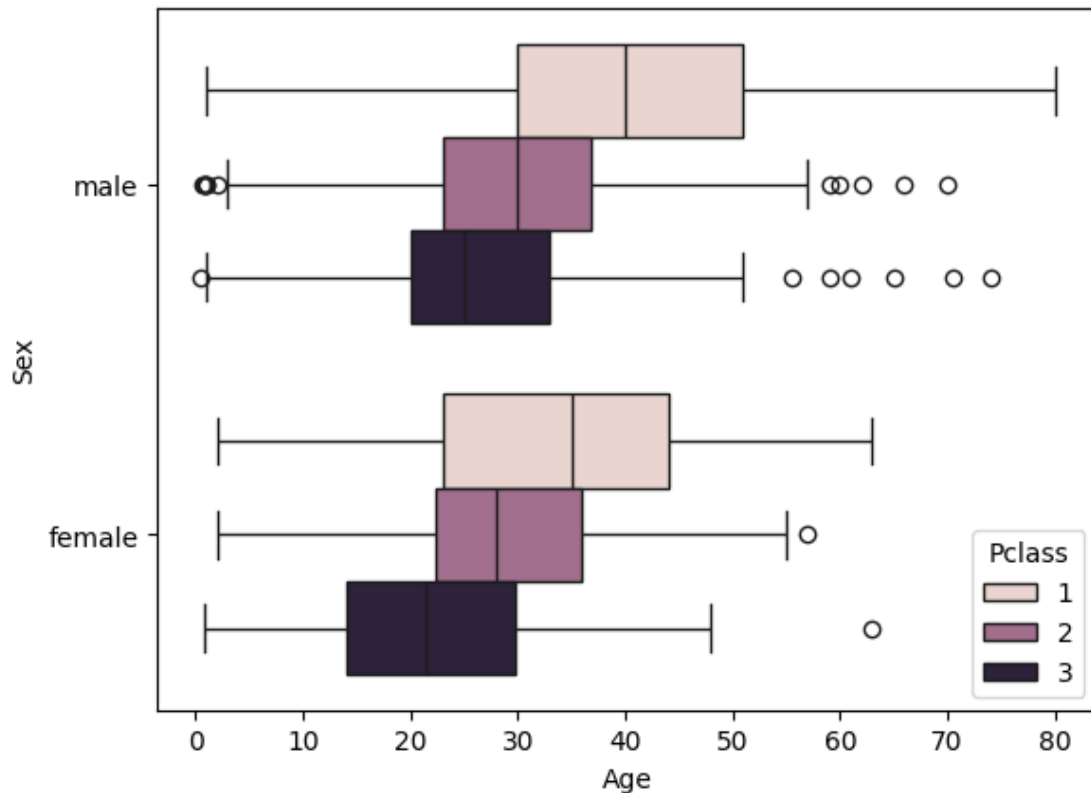
```
[ ]: sns.boxplot(x=ti['Sex'],y=ti['Age'])
#sex(catagorical) ar opor bitti kore age(numerical) ar outlier ber koro( koto
    ↳golo age shababik ager ar bahire)
#hue='Pclass' means kon class ar and kon sex ar manosh ar age outlier hoise(ata
    ↳nicher cell a dakho)
```

```
[ ]: <Axes: xlabel='Sex', ylabel='Age'>
```



```
[ ]: sns.boxplot(x=ti['Age'],y=ti['Sex'],hue=ti['Pclass'])
#sex(catagorical) ar opor bitti kore age(numerical) ar outlier ber koro( koto
    ↳golo age shababik ager ar bahire)
#hue='Pclass' means kon class ar and kon sex ar manosh ar age outlier hoise
```

```
[ ]: <Axes: xlabel='Age', ylabel='Sex'>
```



#distplot(num-cat) ##to show distribution of Numerical Data

```
[ ]: sns.distplot(ti[ti['Survived']==1]['Age'],hist=False)
sns.distplot(ti[ti['Survived']==0]['Age'],hist=False)#jara survive kore nai_
      ↳tader age ar distplot
# sns.distplot(ti[ti['Age']>30]['Survived'])
```

<ipython-input-52-52aa68dbd73c>:1: UserWarning:

`distplot` is a deprecated function and will be removed in seaborn v0.14.0.

Please adapt your code to use either `displot` (a figure-level function with similar flexibility) or `kdeplot` (an axes-level function for kernel density plots).

For a guide to updating your code to use the new functions, please see <https://gist.github.com/mwaskom/de44147ed2974457ad6372750bbe5751>

```
sns.distplot(ti[ti['Survived']==1]['Age'],hist=False)
<ipython-input-52-52aa68dbd73c>:2: UserWarning:
```

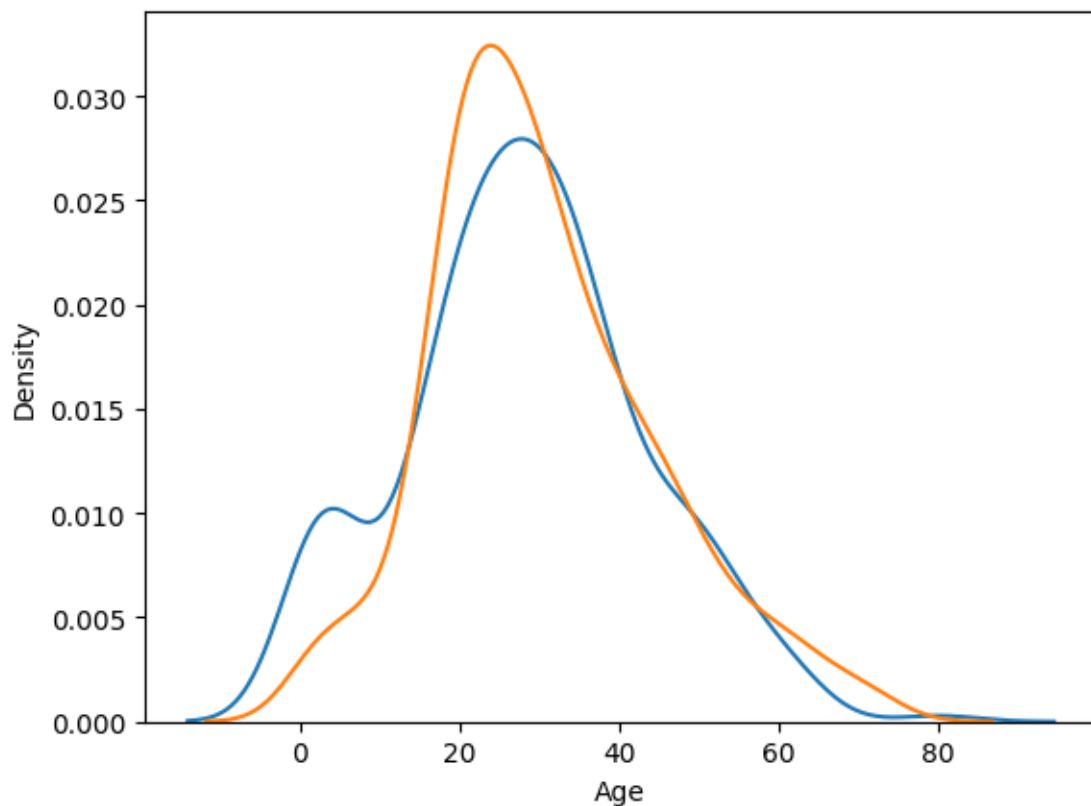
`distplot` is a deprecated function and will be removed in seaborn v0.14.0.

Please adapt your code to use either `displot` (a figure-level function with similar flexibility) or `kdeplot` (an axes-level function for kernel density plots).

For a guide to updating your code to use the new functions, please see <https://gist.github.com/mwaskom/de44147ed2974457ad6372750bbe5751>

```
sns.distplot(ti[ti['Survived']==0]['Age'],hist=False)#jara survive kore nai  
tader age ar distplot
```

```
[ ]: <Axes: xlabel='Age', ylabel='Density'>
```



```
[ ]:
```

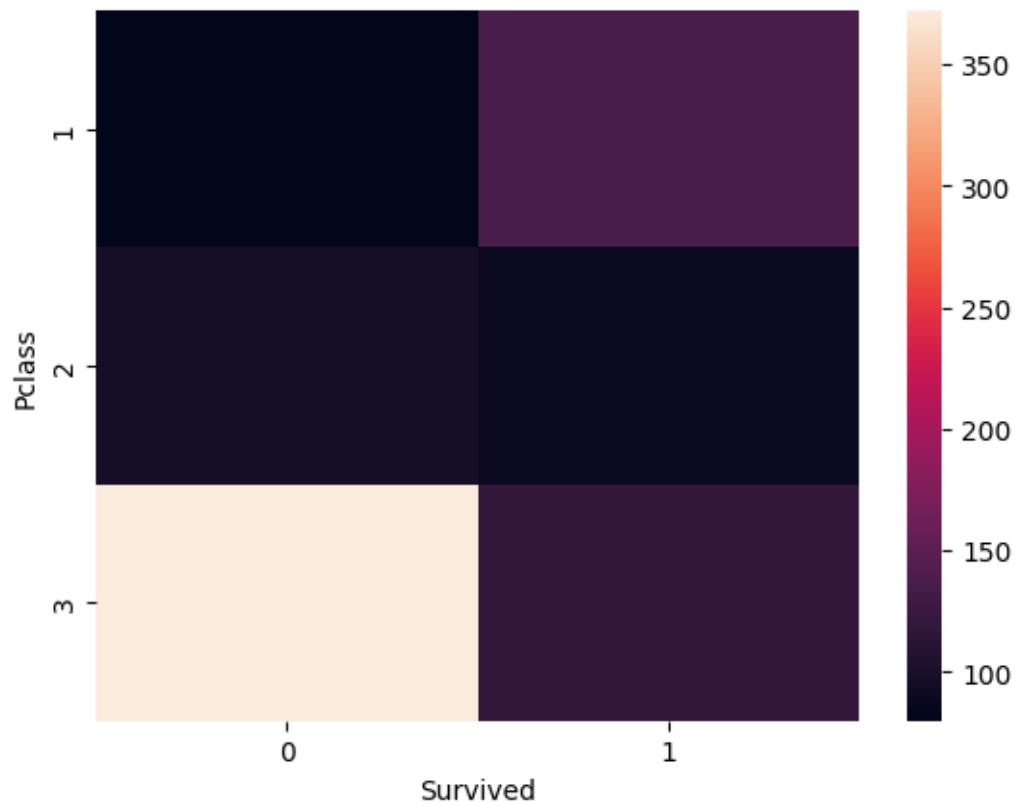
```
#Heatmap(Cat-Cat) ## to show relation between two Number Catagorcal data
```

```
[ ]: #prottok Pclass a koto golo lok jibito ase ar koto golo lok maragase  
# sns.barplot(data=ti,x='Pclass',y='Survived')  
pd.crosstab(ti['Pclass'],ti['Survived'])
```

```
[ ]: Survived    0    1
      Pclass
      1         80   136
      2         97    87
      3        372   119
```

```
[ ]: sns.heatmap(pd.crosstab(ti['Pclass'],ti['Survived']))
```

```
[ ]: <Axes: xlabel='Survived', ylabel='Pclass'>
```

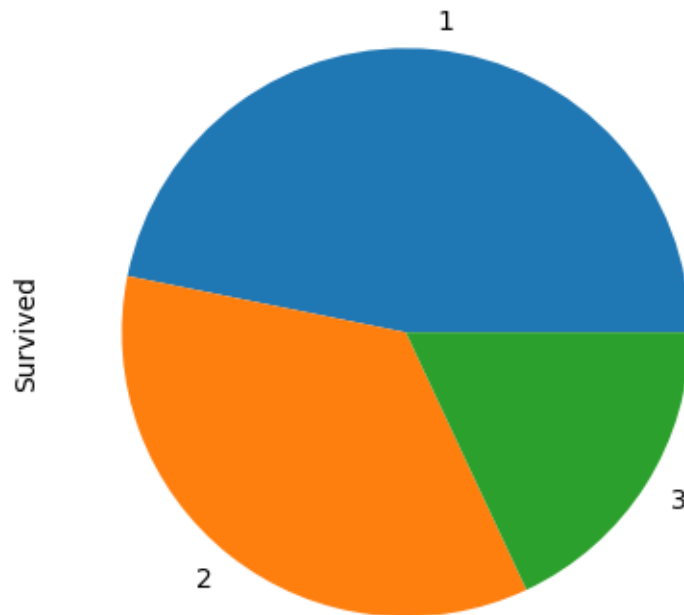


```
[ ]: ti.groupby('Pclass')['Survived'].mean()#catagorical-catagorical
```

```
[ ]: Pclass
      1    0.629630
      2    0.472826
      3    0.242363
      Name: Survived, dtype: float64
```

```
[ ]: ti.groupby('Pclass')['Survived'].mean().plot(kind='pie')
```

```
[ ]: <Axes: ylabel='Survived'>
```



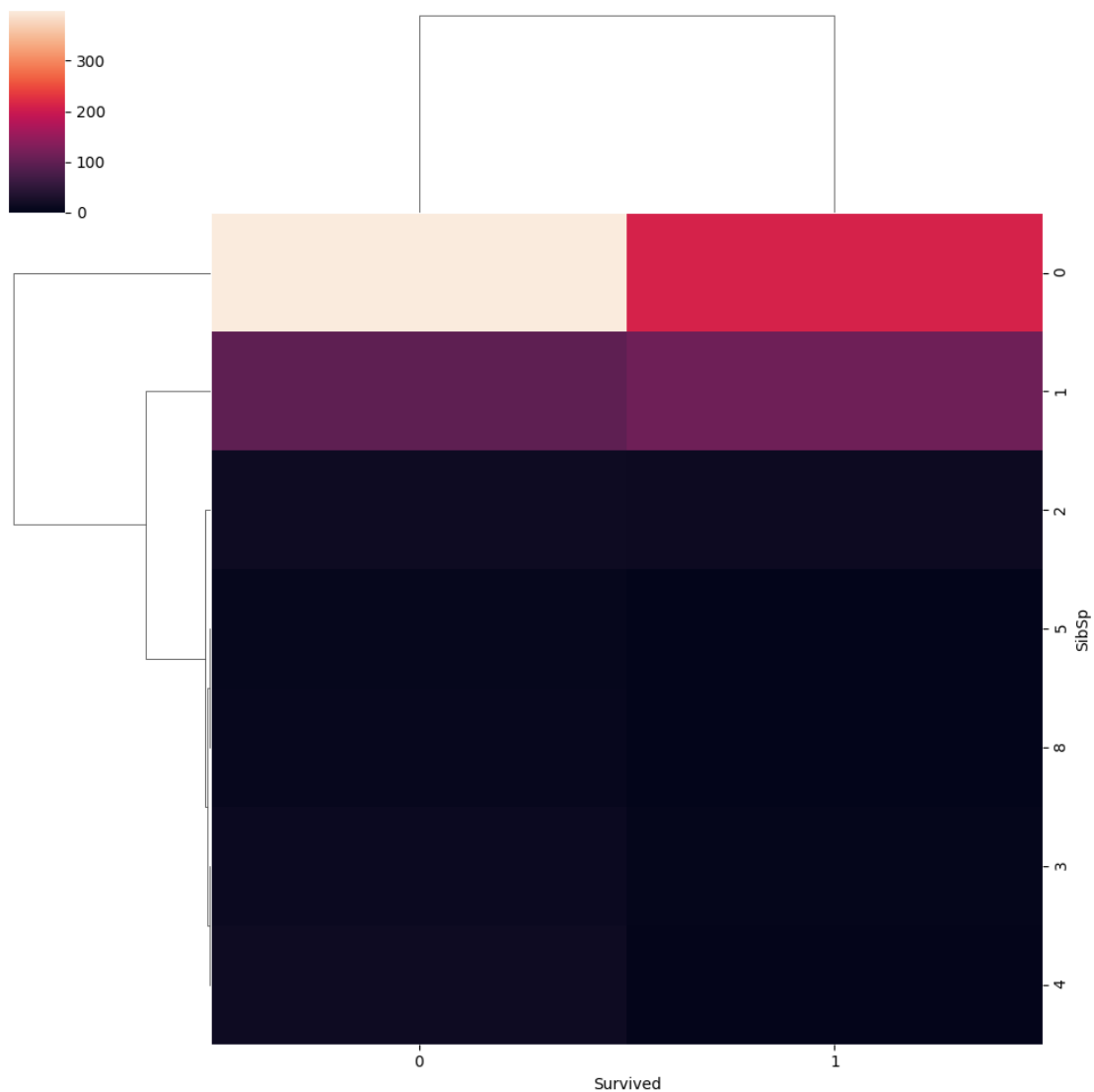
#Clustermap(explind closeness of values) (cata-cata)

```
[ ]: pd.crosstab(ti['SibSp'],ti['Survived'])#(cata-cata relationship)
```

```
[ ]: Survived    0    1
      SibSp
0          398  210
1           97  112
2           15   13
3           12    4
4           15    3
5            5    0
8            7    0
```

```
[ ]: sns.clustermap(pd.crosstab(ti['SibSp'],ti['Survived']))
```

```
[ ]: <seaborn.matrix.ClusterGrid at 0x7d646d7e91d0>
```



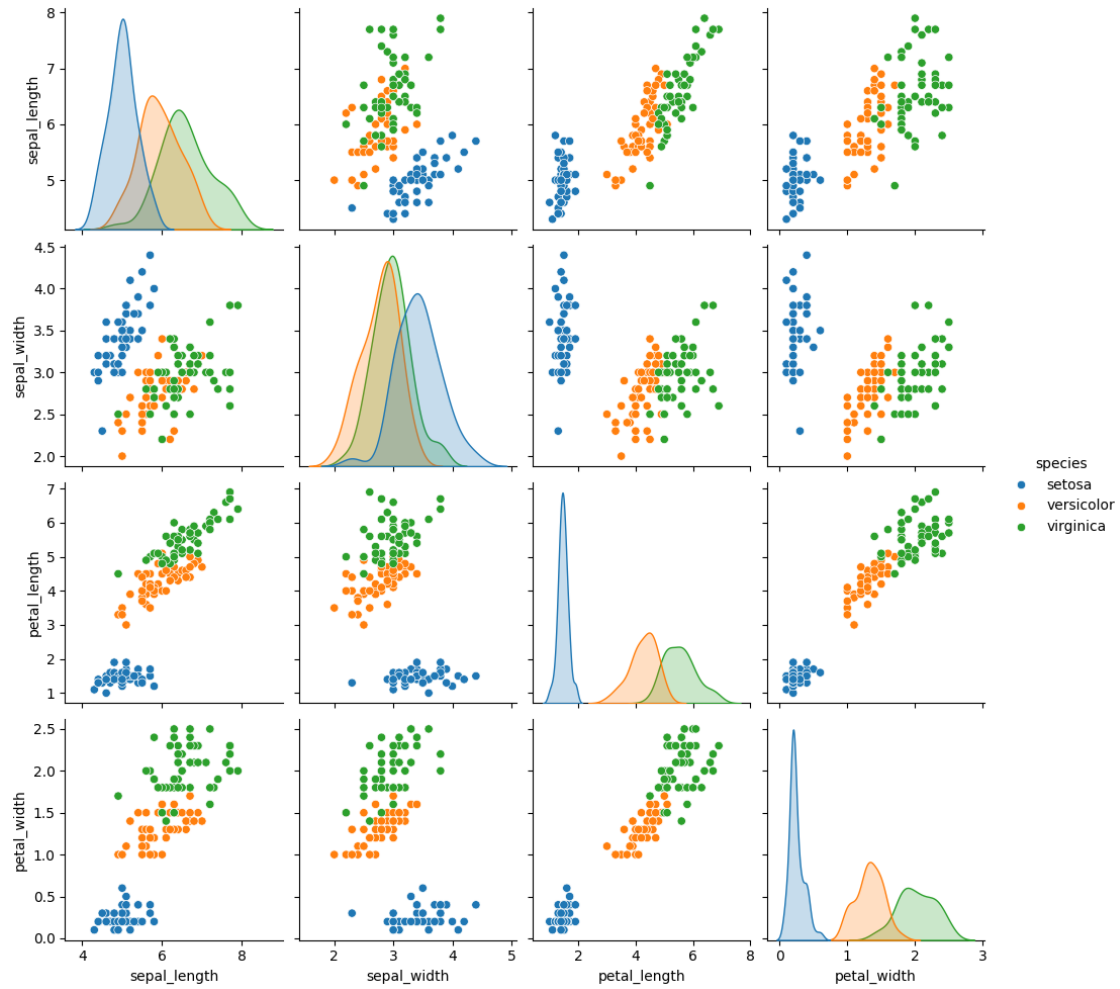
#Pairplot() for see all combinational plot between NUM-NUM and relationship between datas

```
[ ]: iris.sample(3)
```

```
[ ]:      sepal_length  sepal_width  petal_length  petal_width  species
25          5.0          3.0          1.6          0.2    setosa
92          5.8          2.6          4.0          1.2  versicolor
32          5.2          4.1          1.5          0.1    setosa
```

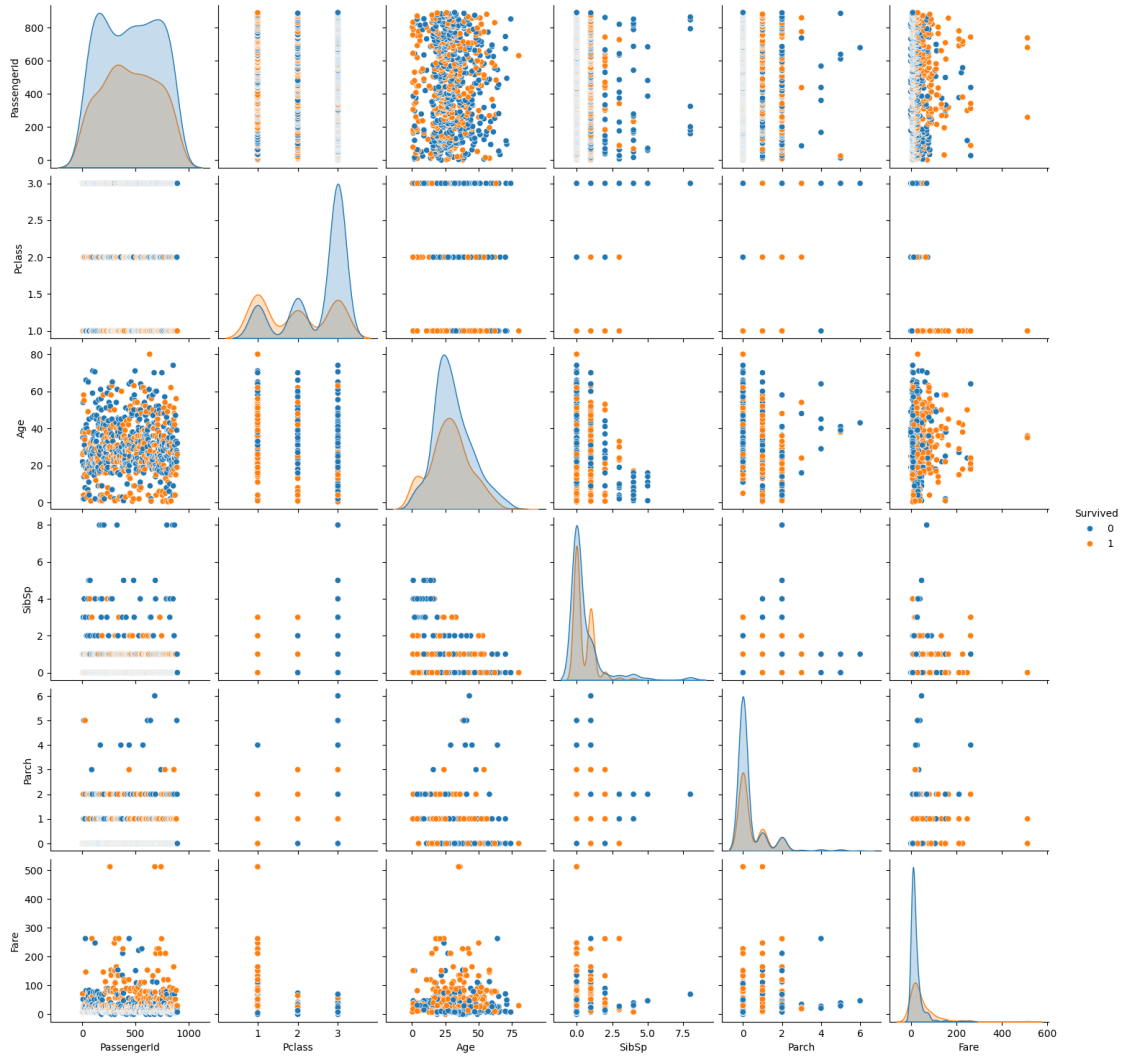
```
[ ]: sns.pairplot(iris,hue='species')
```

```
[ ]: <seaborn.axisgrid.PairGrid at 0x7d646d7f8410>
```



```
[ ]: sns.pairplot(ti,hue='Survived')
```

```
[ ]: <seaborn.axisgrid.PairGrid at 0x7d646c5a7d50>
```



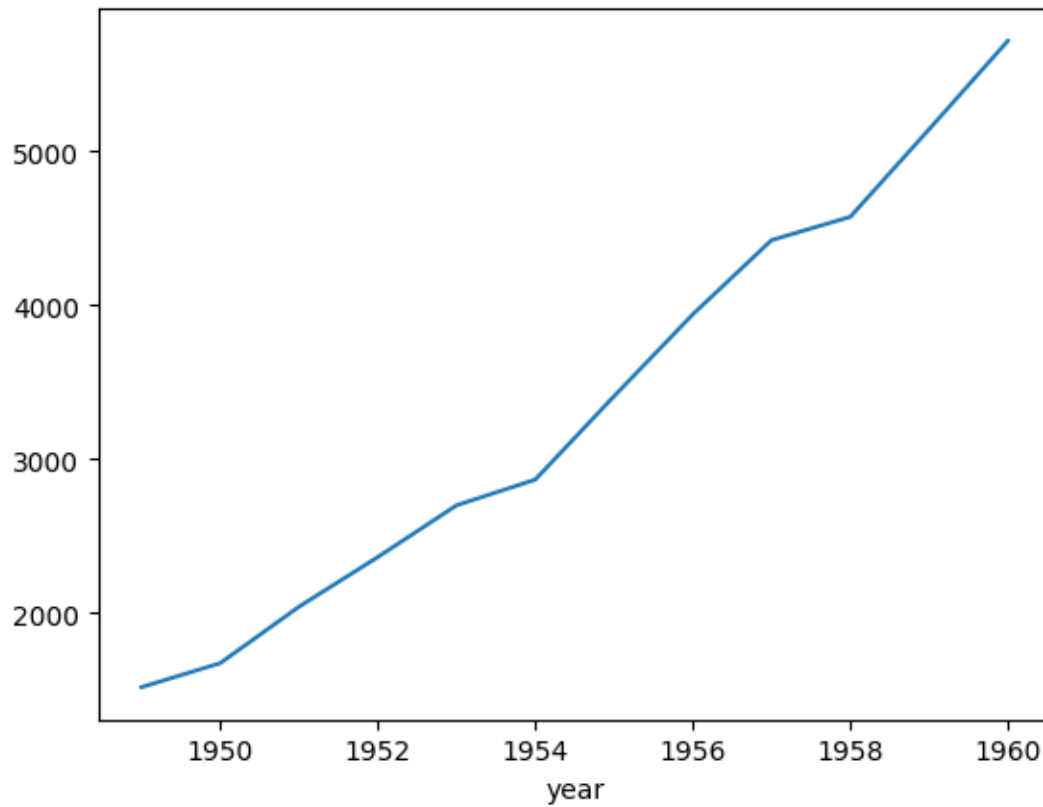
#lineplot(NUM-NUM)when data is time base

```
[ ]: fly.head()
```

```
[ ]:
  year month  passengers
0  1949   Jan         112
1  1949   Feb         118
2  1949   Mar         132
3  1949   Apr         129
4  1949   May         121
```

```
[ ]: fly.groupby('year')['passengers'].sum().plot(kind='line')
```

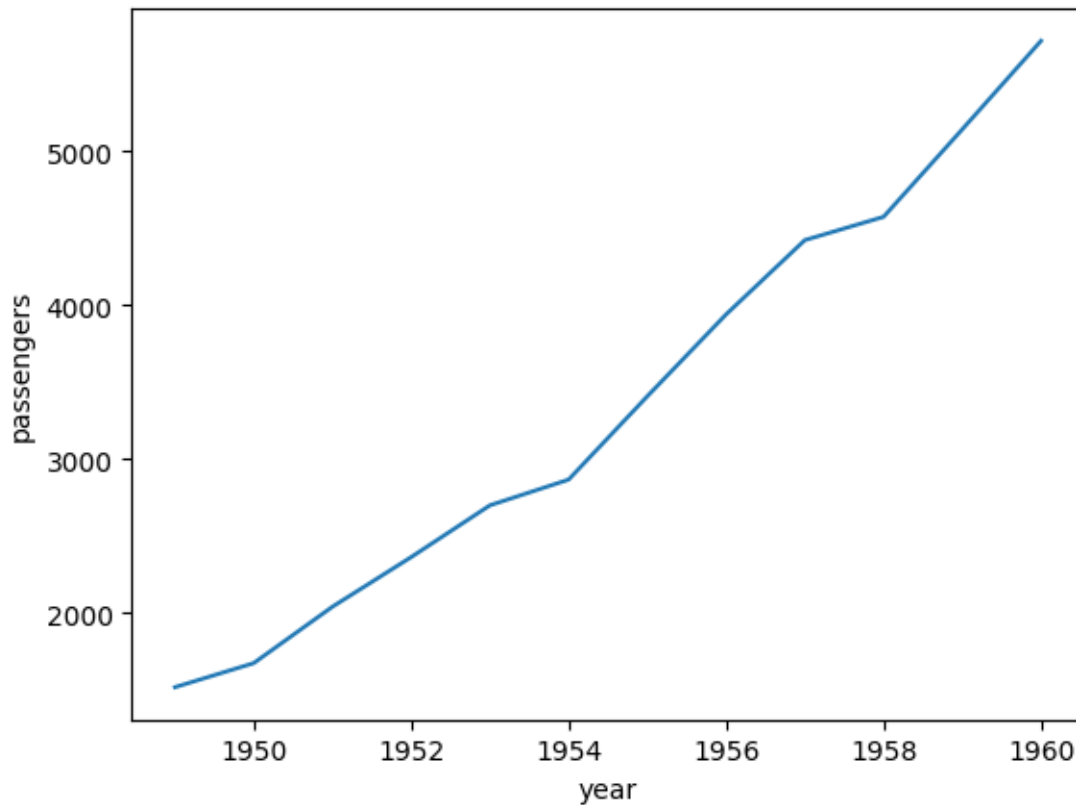
```
[ ]: <Axes: xlabel='year'>
```



```
[ ]: new_fly=fly.groupby('year')['passengers'].sum().reset_index()
```

```
[ ]: sns.lineplot(data=new_fly,x='year',y='passengers')
```

```
[ ]: <Axes: xlabel='year', ylabel='passengers'>
```



```
[ ]: fly.head(5)
```

```
[ ]:   year month  passengers
0  1949   Jan         112
1  1949   Feb         118
2  1949   Mar         132
3  1949   Apr         129
4  1949   May         121
```

```
[ ]: fly.pivot_table(index='year',columns='month',values='passengers')
```

<ipython-input-67-0a371661583e>:1: FutureWarning: The default value of observed=False is deprecated and will change to observed=True in a future version of pandas. Specify observed=False to silence this warning and retain the current behavior

```
fly.pivot_table(index='year',columns='month',values='passengers')
```

```
[ ]: month    Jan    Feb    Mar    Apr    May    Jun    Jul    Aug    Sep    Oct  \
year
1949   112.0   118.0   132.0   129.0   121.0   135.0   148.0   148.0   136.0   119.0
1950   115.0   126.0   141.0   135.0   125.0   149.0   170.0   170.0   158.0   133.0
```


1951	145.0	150.0	178.0	163.0	172.0	178.0	199.0	199.0	184.0	162.0
1952	171.0	180.0	193.0	181.0	183.0	218.0	230.0	242.0	209.0	191.0
1953	196.0	196.0	236.0	235.0	229.0	243.0	264.0	272.0	237.0	211.0
1954	204.0	188.0	235.0	227.0	234.0	264.0	302.0	293.0	259.0	229.0
1955	242.0	233.0	267.0	269.0	270.0	315.0	364.0	347.0	312.0	274.0
1956	284.0	277.0	317.0	313.0	318.0	374.0	413.0	405.0	355.0	306.0
1957	315.0	301.0	356.0	348.0	355.0	422.0	465.0	467.0	404.0	347.0
1958	340.0	318.0	362.0	348.0	363.0	435.0	491.0	505.0	404.0	359.0
1959	360.0	342.0	406.0	396.0	420.0	472.0	548.0	559.0	463.0	407.0
1960	417.0	391.0	419.0	461.0	472.0	535.0	622.0	606.0	508.0	461.0

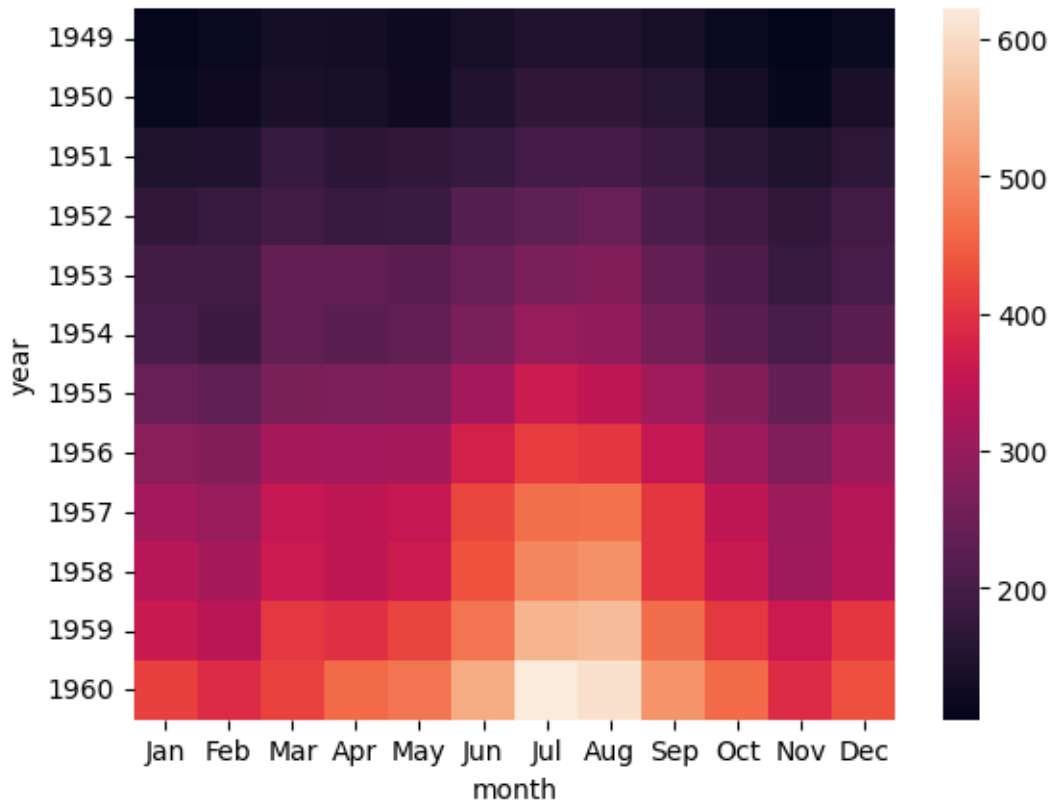
month	Nov	Dec
year		
1949	104.0	118.0
1950	114.0	140.0
1951	146.0	166.0
1952	172.0	194.0
1953	180.0	201.0
1954	203.0	229.0
1955	237.0	278.0
1956	271.0	306.0
1957	305.0	336.0
1958	310.0	337.0
1959	362.0	405.0
1960	390.0	432.0

```
[ ]: sns.heatmap(fly.pivot_table(index='year',columns='month',values='passengers'))
```

```
<ipython-input-68-17c499186041>:1: FutureWarning: The default value of
observed=False is deprecated and will change to observed=True in a future
version of pandas. Specify observed=False to silence this warning and retain the
current behavior
```

```
sns.heatmap(fly.pivot_table(index='year',columns='month',values='passengers'))
```

```
[ ]: <Axes: xlabel='month', ylabel='year'>
```



[]:

#Day-22: Pandas Profileer

- Every Project we should use this
- install and run a pice of code it will be enough
- its very important

[]:

`!pip install ydata-profiling` *#install this and run the below code*

```
Requirement already satisfied: ydata-profiling in
/usr/local/lib/python3.11/dist-packages (4.16.1)
Requirement already satisfied: scipy<1.16,>=1.4.1 in
/usr/local/lib/python3.11/dist-packages (from ydata-profiling) (1.15.2)
Requirement already satisfied: pandas!=1.4.0,<3.0,>1.1 in
/usr/local/lib/python3.11/dist-packages (from ydata-profiling) (2.2.2)
Requirement already satisfied: matplotlib<=3.10,>=3.5 in
/usr/local/lib/python3.11/dist-packages (from ydata-profiling) (3.10.0)
Requirement already satisfied: pydantic>=2 in /usr/local/lib/python3.11/dist-
packages (from ydata-profiling) (2.11.3)
Requirement already satisfied: PyYAML<6.1,>=5.0.0 in
/usr/local/lib/python3.11/dist-packages (from ydata-profiling) (6.0.2)
```

Requirement already satisfied: Jinja2<3.2,>=2.11.1 in
 /usr/local/lib/python3.11/dist-packages (from ydata-profiling) (3.1.6)

Requirement already satisfied: Visions<0.8.2,>=0.7.5 in
 /usr/local/lib/python3.11/dist-packages (from
 Visions[type_image_path]<0.8.2,>=0.7.5->ydata-profiling) (0.8.1)

Requirement already satisfied: NumPy<2.2,>=1.16.0 in
 /usr/local/lib/python3.11/dist-packages (from ydata-profiling) (2.0.2)

Requirement already satisfied: HTMLMin==0.1.12 in
 /usr/local/lib/python3.11/dist-packages (from ydata-profiling) (0.1.12)

Requirement already satisfied: Phik<0.13,>=0.11.1 in
 /usr/local/lib/python3.11/dist-packages (from ydata-profiling) (0.12.4)

Requirement already satisfied: Requests<3,>=2.24.0 in
 /usr/local/lib/python3.11/dist-packages (from ydata-profiling) (2.32.3)

Requirement already satisfied: Tqdm<5,>=4.48.2 in
 /usr/local/lib/python3.11/dist-packages (from ydata-profiling) (4.67.1)

Requirement already satisfied: Seaborn<0.14,>=0.10.1 in
 /usr/local/lib/python3.11/dist-packages (from ydata-profiling) (0.13.2)

Requirement already satisfied: MultiMethod<2,>=1.4 in
 /usr/local/lib/python3.11/dist-packages (from ydata-profiling) (1.12)

Requirement already satisfied: Statsmodels<1,>=0.13.2 in
 /usr/local/lib/python3.11/dist-packages (from ydata-profiling) (0.14.4)

Requirement already satisfied: TypeGuard<5,>=3 in
 /usr/local/lib/python3.11/dist-packages (from ydata-profiling) (4.4.2)

Requirement already satisfied: ImageHash==4.3.1 in
 /usr/local/lib/python3.11/dist-packages (from ydata-profiling) (4.3.1)

Requirement already satisfied: WordCloud>=1.9.3 in
 /usr/local/lib/python3.11/dist-packages (from ydata-profiling) (1.9.4)

Requirement already satisfied: Dacite>=1.8 in /usr/local/lib/python3.11/dist-
 packages (from ydata-profiling) (1.9.2)

Requirement already satisfied: Numba<=0.61,>=0.56.0 in
 /usr/local/lib/python3.11/dist-packages (from ydata-profiling) (0.60.0)

Requirement already satisfied: PyWavelets in /usr/local/lib/python3.11/dist-
 packages (from ImageHash==4.3.1->ydata-profiling) (1.8.0)

Requirement already satisfied: Pillow in /usr/local/lib/python3.11/dist-packages
 (from ImageHash==4.3.1->ydata-profiling) (11.2.1)

Requirement already satisfied: MarkupSafe>=2.0 in
 /usr/local/lib/python3.11/dist-packages (from Jinja2<3.2,>=2.11.1->ydata-
 profiling) (2.1.5)

Requirement already satisfied: ContourPy>=1.0.1 in
 /usr/local/lib/python3.11/dist-packages (from matplotlib<=3.10,>=3.5->ydata-
 profiling) (1.3.2)

Requirement already satisfied: CycLER>=0.10 in /usr/local/lib/python3.11/dist-
 packages (from matplotlib<=3.10,>=3.5->ydata-profiling) (0.12.1)

Requirement already satisfied: FontTools>=4.22.0 in
 /usr/local/lib/python3.11/dist-packages (from matplotlib<=3.10,>=3.5->ydata-
 profiling) (4.57.0)

Requirement already satisfied: Kiwisolver>=1.3.1 in
 /usr/local/lib/python3.11/dist-packages (from matplotlib<=3.10,>=3.5->ydata-

profiling) (1.4.8)
Requirement already satisfied: packaging>=20.0 in
/usr/local/lib/python3.11/dist-packages (from matplotlib<=3.10,>=3.5->ydata-
profiling) (24.2)
Requirement already satisfied: pyparsing>=2.3.1 in
/usr/local/lib/python3.11/dist-packages (from matplotlib<=3.10,>=3.5->ydata-
profiling) (3.2.3)
Requirement already satisfied: python-dateutil>=2.7 in
/usr/local/lib/python3.11/dist-packages (from matplotlib<=3.10,>=3.5->ydata-
profiling) (2.9.0.post0)
Requirement already satisfied: llvmlite<0.44,>=0.43.0dev0 in
/usr/local/lib/python3.11/dist-packages (from numba<=0.61,>=0.56.0->ydata-
profiling) (0.43.0)
Requirement already satisfied: pytz>=2020.1 in /usr/local/lib/python3.11/dist-
packages (from pandas!=1.4.0,<3.0,>1.1->ydata-profiling) (2025.2)
Requirement already satisfied: tzdata>=2022.7 in /usr/local/lib/python3.11/dist-
packages (from pandas!=1.4.0,<3.0,>1.1->ydata-profiling) (2025.2)
Requirement already satisfied: joblib>=0.14.1 in /usr/local/lib/python3.11/dist-
packages (from phik<0.13,>=0.11.1->ydata-profiling) (1.1.1)
Requirement already satisfied: annotated-types>=0.6.0 in
/usr/local/lib/python3.11/dist-packages (from pydantic>=2->ydata-profiling)
(0.7.0)
Requirement already satisfied: pydantic-core==2.33.1 in
/usr/local/lib/python3.11/dist-packages (from pydantic>=2->ydata-profiling)
(2.33.1)
Requirement already satisfied: typing-extensions>=4.12.2 in
/usr/local/lib/python3.11/dist-packages (from pydantic>=2->ydata-profiling)
(4.13.2)
Requirement already satisfied: typing-inspection>=0.4.0 in
/usr/local/lib/python3.11/dist-packages (from pydantic>=2->ydata-profiling)
(0.4.0)
Requirement already satisfied: charset-normalizer<4,>=2 in
/usr/local/lib/python3.11/dist-packages (from requests<3,>=2.24.0->ydata-
profiling) (3.4.1)
Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.11/dist-
packages (from requests<3,>=2.24.0->ydata-profiling) (3.10)
Requirement already satisfied: urllib3<3,>=1.21.1 in
/usr/local/lib/python3.11/dist-packages (from requests<3,>=2.24.0->ydata-
profiling) (2.4.0)
Requirement already satisfied: certifi>=2017.4.17 in
/usr/local/lib/python3.11/dist-packages (from requests<3,>=2.24.0->ydata-
profiling) (2025.4.26)
Requirement already satisfied: patsy>=0.5.6 in /usr/local/lib/python3.11/dist-
packages (from statsmodels<1,>=0.13.2->ydata-profiling) (1.0.1)
Requirement already satisfied: attrs>=19.3.0 in /usr/local/lib/python3.11/dist-
packages (from
visions<0.8.2,>=0.7.5->visions[type_image_path]<0.8.2,>=0.7.5->ydata-profiling)
(25.3.0)

Requirement already satisfied: networkx>=2.4 in /usr/local/lib/python3.11/dist-packages (from visions<0.8.2,>=0.7.5->visions[type_image_path]<0.8.2,>=0.7.5->ydata-profiling) (3.4.2)

Requirement already satisfied: puremagic in /usr/local/lib/python3.11/dist-packages (from visions<0.8.2,>=0.7.5->visions[type_image_path]<0.8.2,>=0.7.5->ydata-profiling) (1.29)

Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.11/dist-packages (from python-dateutil>=2.7->matplotlib<=3.10,>=3.5->ydata-profiling) (1.17.0)

```
[ ]: from pandas_profiling import ProfileReport
prof=ProfileReport(ti)
prof.to_file(output_file='output.html')
#see a output.html file is created in file section open this and observe the
↪analysis
```

Summarize dataset: 0%| | 0/5 [00:00<?, ?it/s]

0%| | 0/12 [00:00<?, ?it/s]
8%| | 1/12 [00:00<00:01, 8.12it/s]
33%| | 4/12 [00:00<00:00, 15.58it/s]
100%| | 12/12 [00:00<00:00, 26.21it/s]

Generate report structure: 0%| | 0/1 [00:00<?, ?it/s]

Render HTML: 0%| | 0/1 [00:00<?, ?it/s]

Export report to file: 0%| | 0/1 [00:00<?, ?it/s]

```
[ ]:
```