In [1]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

In [2]:
```
df=pd.read_csv("uber.csv")[0:500]
df
```

Out[2]:

| | Unnamed: 0 | key | fare_amount | pickup_datetime | pickup_longitude | pickup_latitude | dr |
|---|---|---|---|---|---|---|---|
| **0** | 24238194 | 2015-05-07 19:52:06.0000003 | 7.5 | 2015-05-07 19:52:06 UTC | -73.999817 | 40.738354 | |
| **1** | 27835199 | 2009-07-17 20:04:56.0000002 | 7.7 | 2009-07-17 20:04:56 UTC | -73.994355 | 40.728225 | |
| **2** | 44984355 | 2009-08-24 21:45:00.00000061 | 12.9 | 2009-08-24 21:45:00 UTC | -74.005043 | 40.740770 | |
| **3** | 25894730 | 2009-06-26 08:22:21.0000001 | 5.3 | 2009-06-26 08:22:21 UTC | -73.976124 | 40.790844 | |
| **4** | 17610152 | 2014-08-28 17:47:00.000000188 | 16.0 | 2014-08-28 17:47:00 UTC | -73.925023 | 40.744085 | |
| **...** | ... | ... | ... | ... | ... | ... | ... |
| **495** | 1204312 | 2012-06-03 12:18:02.0000001 | 25.7 | 2012-06-03 12:18:02 UTC | -73.862765 | 40.770908 | |
| **496** | 2511529 | 2014-12-24 05:54:45.0000001 | 8.0 | 2014-12-24 05:54:45 UTC | -73.918530 | 40.743330 | |
| **497** | 24116460 | 2010-01-18 02:18:16.0000001 | 10.5 | 2010-01-18 02:18:16 UTC | -74.005734 | 40.743641 | |
| **498** | 42607669 | 2015-03-30 10:58:37.0000001 | 5.5 | 2015-03-30 10:58:37 UTC | -74.001648 | 40.740940 | |
| **499** | 36533403 | 2015-03-09 16:16:21.0000006 | 10.0 | 2015-03-09 16:16:21 UTC | -73.960037 | 40.780624 | |

500 rows × 9 columns

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

Out[3]:

| | Unnamed: 0 | key | fare_amount | pickup_datetime | pickup_longitude | pickup_latitude | drop |
|---|---|---|---|---|---|---|---|
| **0** | 24238194 | 2015-05-07 19:52:06.0000003 | 7.5 | 2015-05-07 19:52:06 UTC | -73.999817 | 40.738354 | |
| **1** | 27835199 | 2009-07-17 20:04:56.0000002 | 7.7 | 2009-07-17 20:04:56 UTC | -73.994355 | 40.728225 | |

| | Unnamed: 0 | key | fare_amount | pickup_datetime | pickup_longitude | pickup_latitude | drop |
|---|---|---|---|---|---|---|---|
| **2** | 44984355 | 2009-08-24 21:45:00.00000061 | 12.9 | 2009-08-24 21:45:00 UTC | -74.005043 | 40.740770 | |
| **3** | 25894730 | 2009-06-26 08:22:21.0000001 | 5.3 | 2009-06-26 08:22:21 UTC | -73.976124 | 40.790844 | |
| **4** | 17610152 | 2014-08-28 17:47:00.000000188 | 16.0 | 2014-08-28 17:47:00 UTC | -73.925023 | 40.744085 | |

# DATA CLEANING AND DATA PREPROCESSING

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

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 500 entries, 0 to 499
Data columns (total 9 columns):
 #   Column             Non-Null Count  Dtype  
---  ------             --------------  -----  
 0   Unnamed: 0         500 non-null    int64  
 1   key                500 non-null    object 
 2   fare_amount        500 non-null    float64
 3   pickup_datetime    500 non-null    object 
 4   pickup_longitude   500 non-null    float64
 5   pickup_latitude    500 non-null    float64
 6   dropoff_longitude  500 non-null    float64
 7   dropoff_latitude   500 non-null    float64
 8   passenger_count    500 non-null    int64  
dtypes: float64(5), int64(2), object(2)
memory usage: 35.3+ KB
```

In [5]:
```
df.describe()
```

Out[5]:

| | Unnamed: 0 | fare_amount | pickup_longitude | pickup_latitude | dropoff_longitude | dropoff_latitude |
|---|---|---|---|---|---|---|
| **count** | 5.000000e+02 | 500.000000 | 500.000000 | 500.000000 | 500.000000 | 500.000000 |
| **mean** | 2.737940e+07 | 10.708720 | -72.053865 | 39.692497 | -72.201155 | 39.772818 |
| **std** | 1.607155e+07 | 8.334145 | 11.784239 | 6.491541 | 11.333432 | 6.243123 |
| **min** | 1.862090e+05 | 2.500000 | -74.030417 | 0.000000 | -74.027813 | 0.000000 |
| **25%** | 1.250293e+07 | 6.000000 | -73.992804 | 40.735994 | -73.991571 | 40.730869 |
| **50%** | 2.749836e+07 | 8.100000 | -73.982352 | 40.752445 | -73.980784 | 40.750428 |
| **75%** | 4.157492e+07 | 12.500000 | -73.968724 | 40.765865 | -73.965878 | 40.767497 |
| **max** | 5.519870e+07 | 57.330000 | 0.001782 | 40.850558 | 0.000875 | 40.901391 |

In [6]:
```
df.columns
```

Out[6]:
```
Index(['Unnamed: 0', 'key', 'fare_amount', 'pickup_datetime',
       'pickup_longitude', 'pickup_latitude', 'dropoff_longitude',
       'dropoff_latitude', 'passenger_count'],
      dtype='object')
```

In [7]:
```
df1=df.dropna(axis=1)
df1
```

Out[7]:

| | Unnamed: 0 | key | fare_amount | pickup_datetime | pickup_longitude | pickup_latitude | dr |
|---|---|---|---|---|---|---|---|
| **0** | 24238194 | 2015-05-07 19:52:06.0000003 | 7.5 | 2015-05-07 19:52:06 UTC | -73.999817 | 40.738354 | |
| **1** | 27835199 | 2009-07-17 20:04:56.0000002 | 7.7 | 2009-07-17 20:04:56 UTC | -73.994355 | 40.728225 | |
| **2** | 44984355 | 2009-08-24 21:45:00.00000061 | 12.9 | 2009-08-24 21:45:00 UTC | -74.005043 | 40.740770 | |
| **3** | 25894730 | 2009-06-26 08:22:21.0000001 | 5.3 | 2009-06-26 08:22:21 UTC | -73.976124 | 40.790844 | |
| **4** | 17610152 | 2014-08-28 17:47:00.000000188 | 16.0 | 2014-08-28 17:47:00 UTC | -73.925023 | 40.744085 | |
| **...** | ... | ... | ... | ... | ... | ... | ... |
| **495** | 1204312 | 2012-06-03 12:18:02.0000001 | 25.7 | 2012-06-03 12:18:02 UTC | -73.862765 | 40.770908 | |
| **496** | 2511529 | 2014-12-24 05:54:45.0000001 | 8.0 | 2014-12-24 05:54:45 UTC | -73.918530 | 40.743330 | |
| **497** | 24116460 | 2010-01-18 02:18:16.0000001 | 10.5 | 2010-01-18 02:18:16 UTC | -74.005734 | 40.743641 | |
| **498** | 42607669 | 2015-03-30 10:58:37.0000001 | 5.5 | 2015-03-30 10:58:37 UTC | -74.001648 | 40.740940 | |
| **499** | 36533403 | 2015-03-09 16:16:21.0000006 | 10.0 | 2015-03-09 16:16:21 UTC | -73.960037 | 40.780624 | |

500 rows × 9 columns

In [8]:
```
df1.columns
```

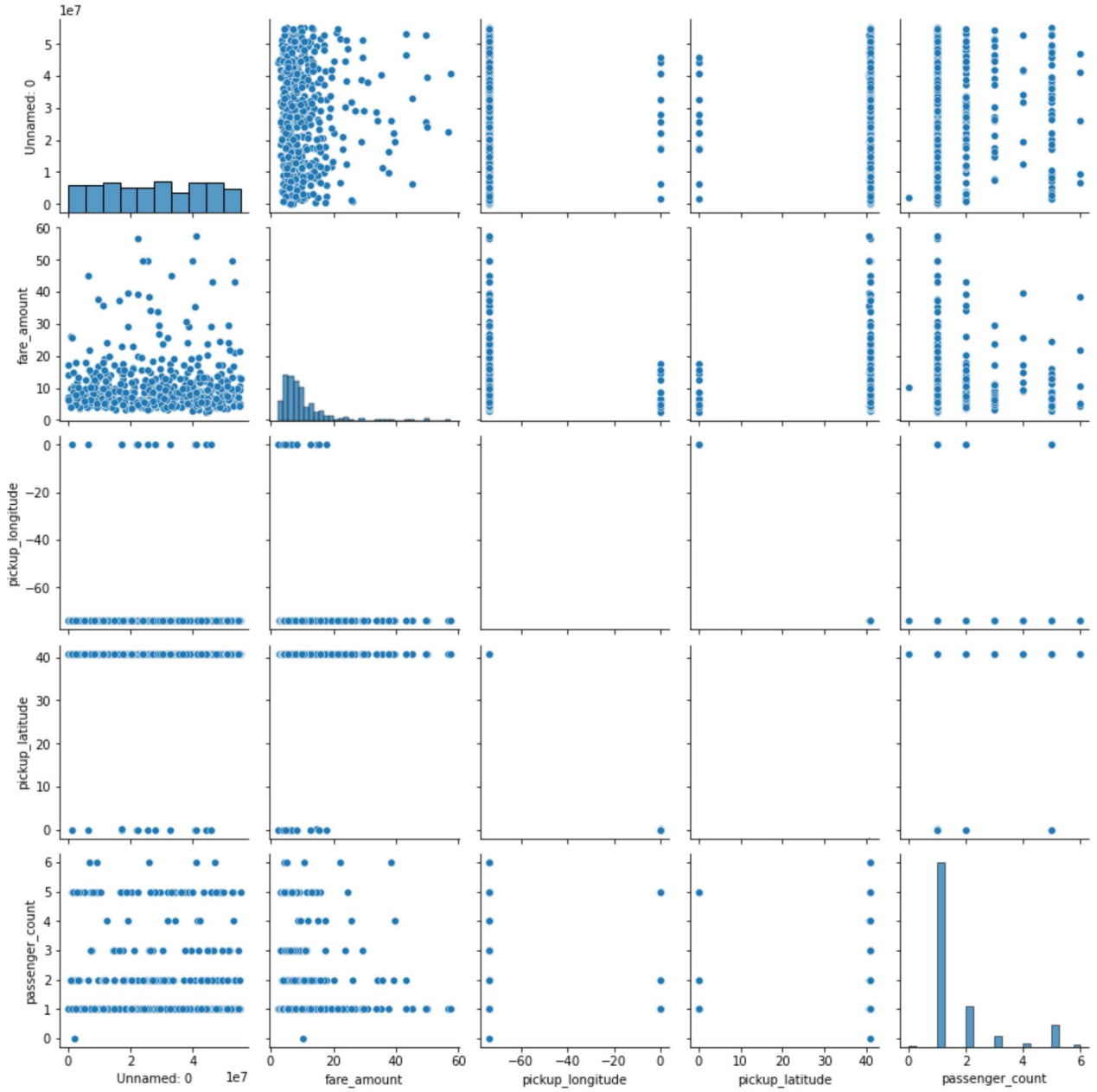
Out[8]:
```
Index(['Unnamed: 0', 'key', 'fare_amount', 'pickup_datetime',
       'pickup_longitude', 'pickup_latitude', 'dropoff_longitude',
       'dropoff_latitude', 'passenger_count'],
      dtype='object')
```

In [9]:
```
df1=df1[['Unnamed: 0', 'fare_amount',
       'pickup_longitude', 'pickup_latitude', 'passenger_count']]
```

# EDA AND VISUALIZATION

In [10]:
```
sns.pairplot(df1)
```

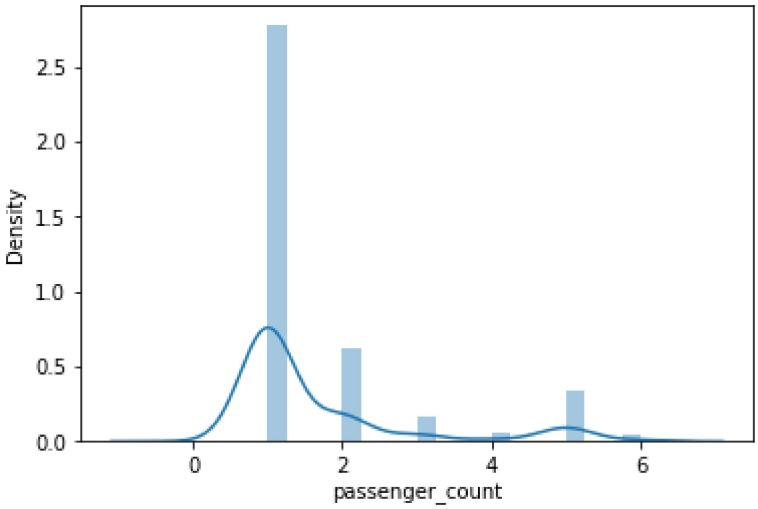
Out[10]: <seaborn.axisgrid.PairGrid at 0x1ba93645ac0>




In [11]:
```
sns.distplot(df1['passenger_count'])
```

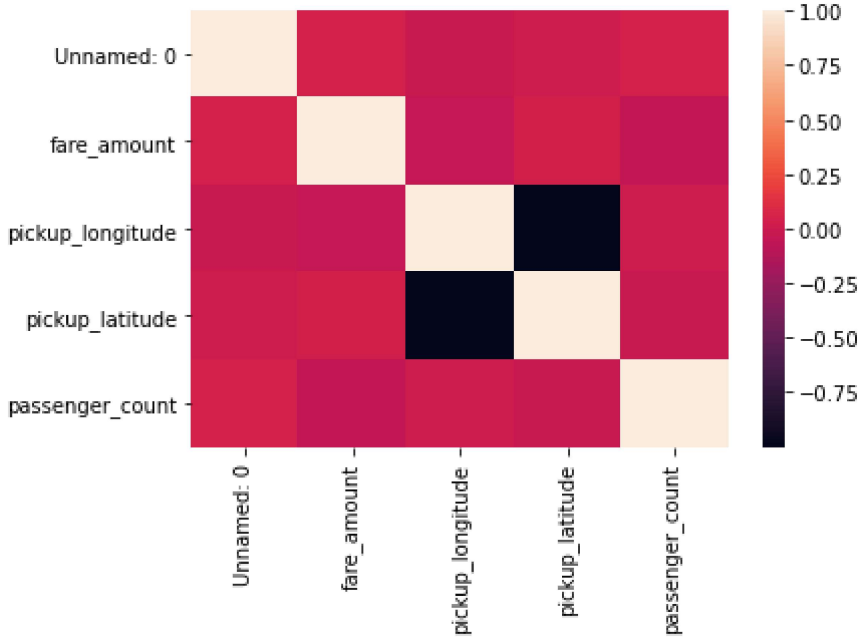
```
C:\ProgramData\Anaconda3\lib\site-packages\seaborn\distributions.py:2557: FutureWarning:
`distplot` is a deprecated function and will be removed in a future version. Please adap
t your code to use either `displot` (a figure-level function with similar flexibility) o
r `histplot` (an axes-level function for histograms).
  warnings.warn(msg, FutureWarning)
```

Out[11]: <AxesSubplot:xlabel='passenger_count', ylabel='Density'>




In [12]:
```
sns.heatmap(df1.corr())
```

Out[12]: <AxesSubplot:>




# TO TRAIN THE MODEL AND MODEL BULDING

In [13]:
```
x=df1[['Unnamed: 0', 'fare_amount',
       'pickup_longitude', 'pickup_latitude']]
y=df1['passenger_count']
```

In [14]:
```
from sklearn.model_selection import train_test_split
x_train,x_test,y_train,y_test=train_test_split(x,y,test_size=0.3)
```

In [15]:
```
from sklearn.linear_model import LinearRegression
lr=LinearRegression()
lr.fit(x_train,y_train)
```

Out[15]:
```
LinearRegression()
```

In [16]:
```
lr.intercept_
```

Out[16]:
```
1.6233076377302478
```

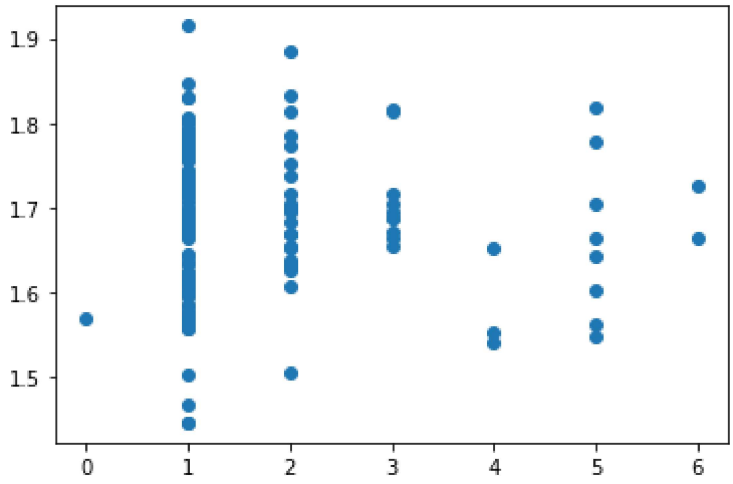
In [17]:
```
coeff=pd.DataFrame(lr.coef_,x.columns,columns=['Co-efficient'])
coeff
```

Out[17]:

| | Co-efficient |
|---|---|
| **Unnamed: 0** | -1.228644e-09 |
| **fare_amount** | -5.086356e-03 |
| **pickup_longitude** | 1.324858e+00 |
| **pickup_latitude** | 2.408811e+00 |

In [18]:
```
prediction =lr.predict(x_test)
plt.scatter(y_test,prediction)
```

Out[18]:
```
<matplotlib.collections.PathCollection at 0x1baa5e25700>
```




# ACCURACY

In [19]:
```
lr.score(x_test,y_test)
```

Out[19]:
```
-0.015235925500048264
```

In [20]:
```
lr.score(x_train,y_train)
```

Out[20]:
```
0.004264270361524547
```

In [21]:
```
from sklearn.linear_model import Ridge,Lasso
rr=Ridge(alpha=10)
rr.fit(x_train,y_train)
```

```
C:\ProgramData\Anaconda3\lib\site-packages\sklearn\linear_model\_ridge.py:147: LinAlgWar
ning: Ill-conditioned matrix (rcond=9.50105e-17): result may not be accurate.
  return linalg.solve(A, Xy, sym_pos=True,
```

Out[21]:
```
Ridge(alpha=10)
```

In [22]:
```
rr.score(x_train,y_train)
```

Out[22]:
```
0.001000018493586663
```

In [23]:
```
rr.score(x_test,y_test)
```

Out[23]:
```
-0.008444782606296553
```

In [24]:
```
la=Lasso(alpha=10)
la.fit(x_train,y_train)
```

Out[24]:
```
Lasso(alpha=10)
```

In [25]:
```
la.score(x_train,y_train)
```

Out[25]:
```
0.00011822679085504717
```

In [26]:
```
la.score(x_test,y_test)
```

Out[26]:
```
-0.00866682384559514
```