**Importing Important Libraries**

```
import pandas as pd
import seaborn as sns
from sklearn.model_selection import train_test_split
from sklearn.linear_model import LinearRegression
from sklearn.metrics import r2_score
import warnings
warnings.filterwarnings("ignore")
import matplotlib.pyplot as plt
import numpy as np

z = pd.read_csv(r"C:\Users\skj_h\OneDrive\Desktop\dataset\day.csv")
z
```

```
     instant      dteday  season  yr  mnth  holiday  weekday
workingday  \
0          1  01-01-2018       1   0     1        0        1
1
1          2  02-01-2018       1   0     1        0        2
1
2          3  03-01-2018       1   0     1        0        3
1
3          4  04-01-2018       1   0     1        0        4
1
4          5  05-01-2018       1   0     1        0        5
1
..       ...         ...     ...  ..   ...      ...      ...          .
..
725      726  27-12-2019       1   1    12        0        5
1
726      727  28-12-2019       1   1    12        0        6
0
727      728  29-12-2019       1   1    12        0        0
0
728      729  30-12-2019       1   1    12        0        1
1
729      730  31-12-2019       1   1    12        0        2
1

     weathersit       temp     atemp      hum  windspeed  casual
registered  \
0             2  14.110847  18.18125  80.5833  10.749882     331
654
1             2  14.902598  17.68695  69.6087  16.652113     131
670
2             1   8.050924   9.47025  43.7273  16.636703     120
1229
3             1   8.200000  10.60610  59.0435  10.739832     108
```

```
1454
4             1   9.305237  11.46350  43.6957  12.522300      82
1518
..          ...        ...       ...      ...        ...     ...
...
725           2  10.420847  11.33210  65.2917  23.458911     247
1867
726           2  10.386653  12.75230  59.0000  10.416557     644
2451
727           2  10.386653  12.12000  75.2917   8.333661     159
1182
728           1  10.489153  11.58500  48.3333  23.500518     364
1432
729           2   8.849153  11.17435  57.7500  10.374682     439
2290

      cnt
0     985
1     801
2    1349
3    1562
4    1600
..    ...
725  2114
726  3095
727  1341
728  1796
729  2729

[730 rows x 16 columns]
```

```
z.isnull().sum()
```

```
instant       0
dteday        0
season        0
yr            0
mnth          0
holiday       0
weekday       0
workingday    0
weathersit    0
temp          0
atemp         0
hum           0
windspeed     0
casual        0
registered    0
cnt           0
dtype: int64
```

```
z.shape
```

```
(730, 16)
```

```
z.size
```

```
11680
```

```
z.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 730 entries, 0 to 729
Data columns (total 16 columns):
 #   Column      Non-Null Count  Dtype  
---  ------      --------------  -----  
 0   instant     730 non-null    int64  
 1   dteday      730 non-null    object 
 2   season      730 non-null    int64  
 3   yr          730 non-null    int64  
 4   mnth        730 non-null    int64  
 5   holiday     730 non-null    int64  
 6   weekday     730 non-null    int64  
 7   workingday  730 non-null    int64  
 8   weathersit  730 non-null    int64  
 9   temp        730 non-null    float64
 10  atemp       730 non-null    float64
 11  hum         730 non-null    float64
 12  windspeed   730 non-null    float64
 13  casual      730 non-null    int64  
 14  registered  730 non-null    int64  
 15  cnt         730 non-null    int64  
dtypes: float64(4), int64(11), object(1)
memory usage: 91.4+ KB
```

```
z.dtypes
```

```
instant         int64
dteday         object
season          int64
yr              int64
mnth            int64
holiday         int64
weekday         int64
workingday      int64
weathersit      int64
temp          float64
atemp         float64
hum           float64
windspeed     float64
casual          int64
registered      int64
```

```
cnt             int64
dtype: object
```

```
z.ndim
```

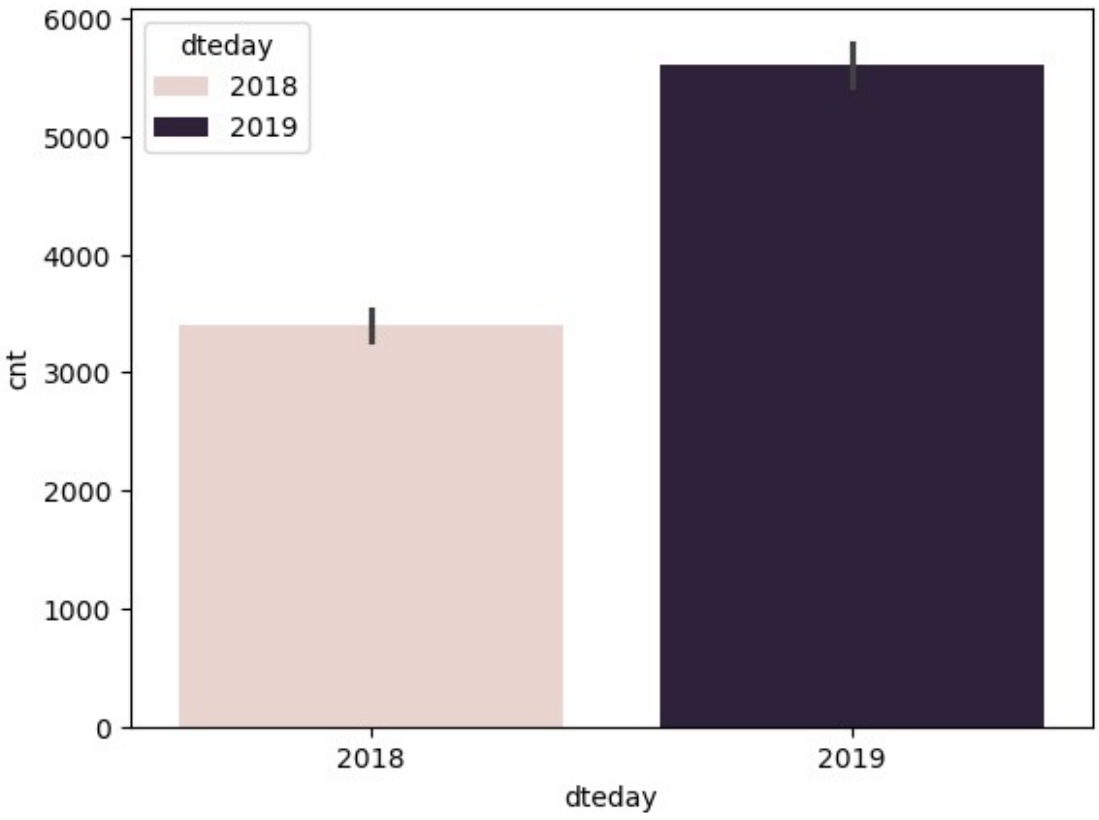
```
2
```

```
z.columns
```

```
Index(['instant', 'dteday', 'season', 'yr', 'mnth', 'holiday',
'weekday',
       'workingday', 'weathersit', 'temp', 'atemp', 'hum',
'windspeed',
       'casual', 'registered', 'cnt'],
      dtype='object')
```

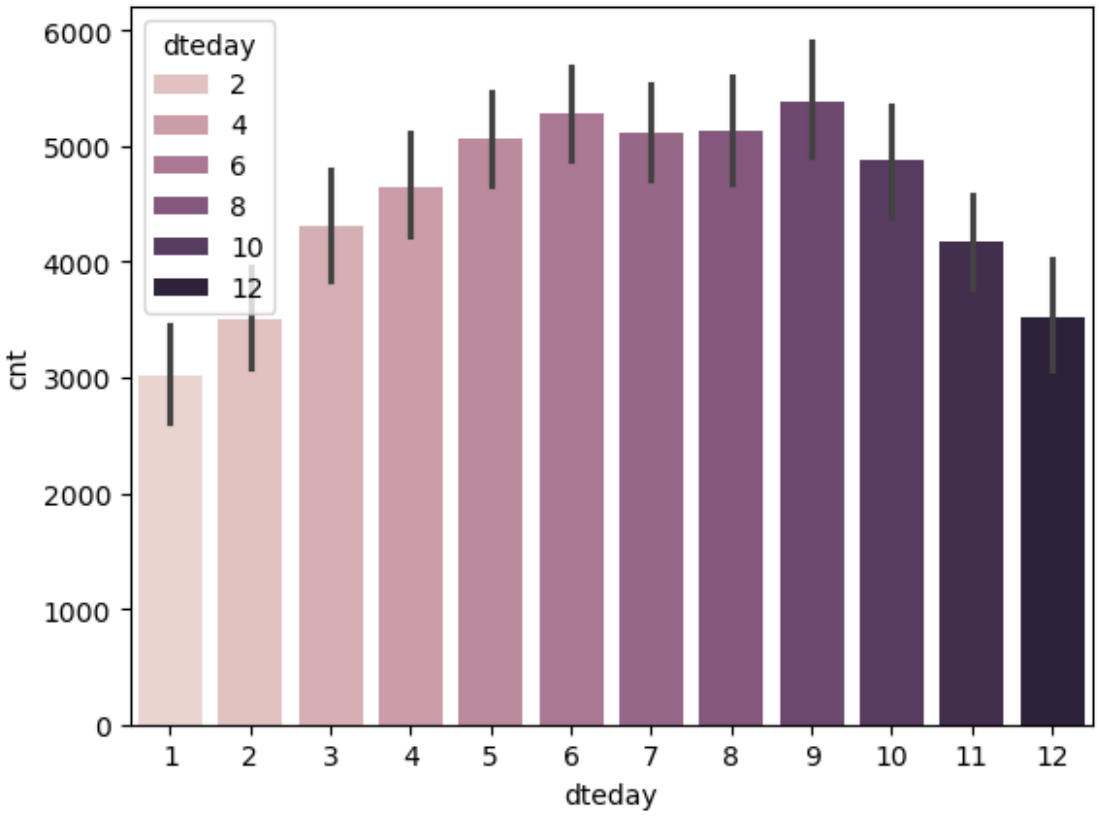
```
sns.barplot(x = pd.DatetimeIndex(z["dteday"]).year, y = z["cnt"], data
= z, hue = pd.DatetimeIndex(z["dteday"]).year)
```

```
<Axes: xlabel='dteday', ylabel='cnt'>
```



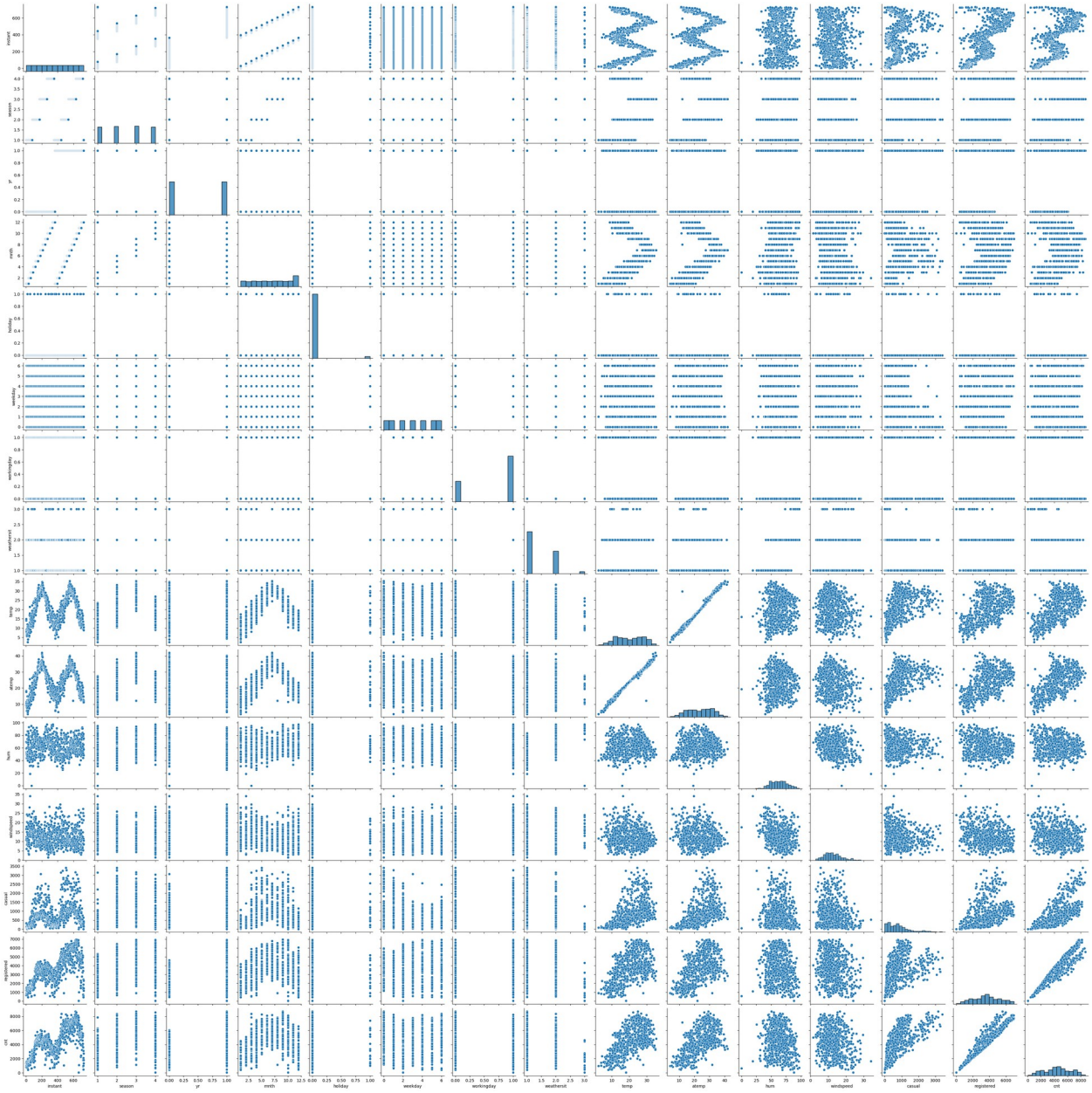

```
sns.barplot(x = pd.DatetimeIndex(z["dteday"]).month, y = z["cnt"],
data = z, hue = pd.DatetimeIndex(z["dteday"]).month)
```

```
<Axes: xlabel='dteday', ylabel='cnt'>
```




```
sns.pairplot(z)
```

```
<seaborn.axisgrid.PairGrid at 0x1e71beceab0>
```



```
b = z.copy()
for i in b:
    if(b[i].dtype == "object"):
        b.drop([i], axis =1, inplace = True)

b
```

```
     instant  season  yr  mnth  holiday  weekday  workingday
weathersit  \
0          1       1   0     1        0        1           1
2
1          2       1   0     1        0        2           1
```

```
2
2           3       1   0     1        0        3           1
1
3           4       1   0     1        0        4           1
1
4           5       1   0     1        0        5           1
1
..        ...     ...  ..   ...      ...      ...         ...         .
..
725       726       1   1    12        0        5           1
2
726       727       1   1    12        0        6           0
2
727       728       1   1    12        0        0           0
2
728       729       1   1    12        0        1           1
1
729       730       1   1    12        0        2           1
2

           temp     atemp      hum  windspeed  casual  registered   cnt

0     14.110847  18.18125  80.5833  10.749882     331         654   985

1     14.902598  17.68695  69.6087  16.652113     131         670   801

2      8.050924   9.47025  43.7273  16.636703     120        1229  1349

3      8.200000  10.60610  59.0435  10.739832     108        1454  1562

4      9.305237  11.46350  43.6957  12.522300      82        1518  1600

..          ...       ...      ...        ...     ...         ...   ...

725   10.420847  11.33210  65.2917  23.458911     247        1867  2114

726   10.386653  12.75230  59.0000  10.416557     644        2451  3095

727   10.386653  12.12000  75.2917   8.333661     159        1182  1341

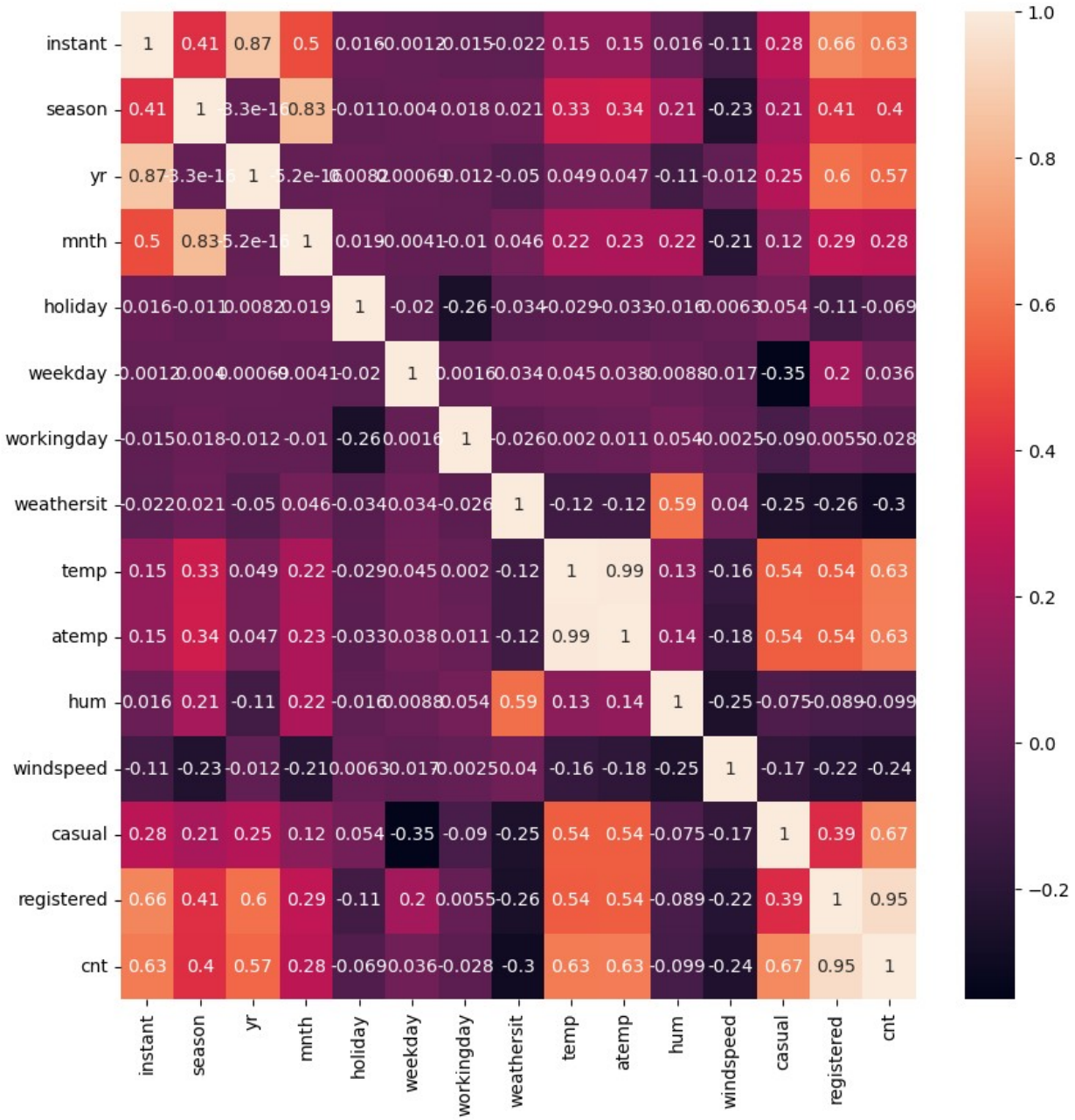
728   10.489153  11.58500  48.3333  23.500518     364        1432  1796

729    8.849153  11.17435  57.7500  10.374682     439        2290  2729


[730 rows x 15 columns]

plt.figure(figsize = (10, 10))
sns.heatmap(b.corr(), annot = True, alpha = 1)

<Axes: >
```



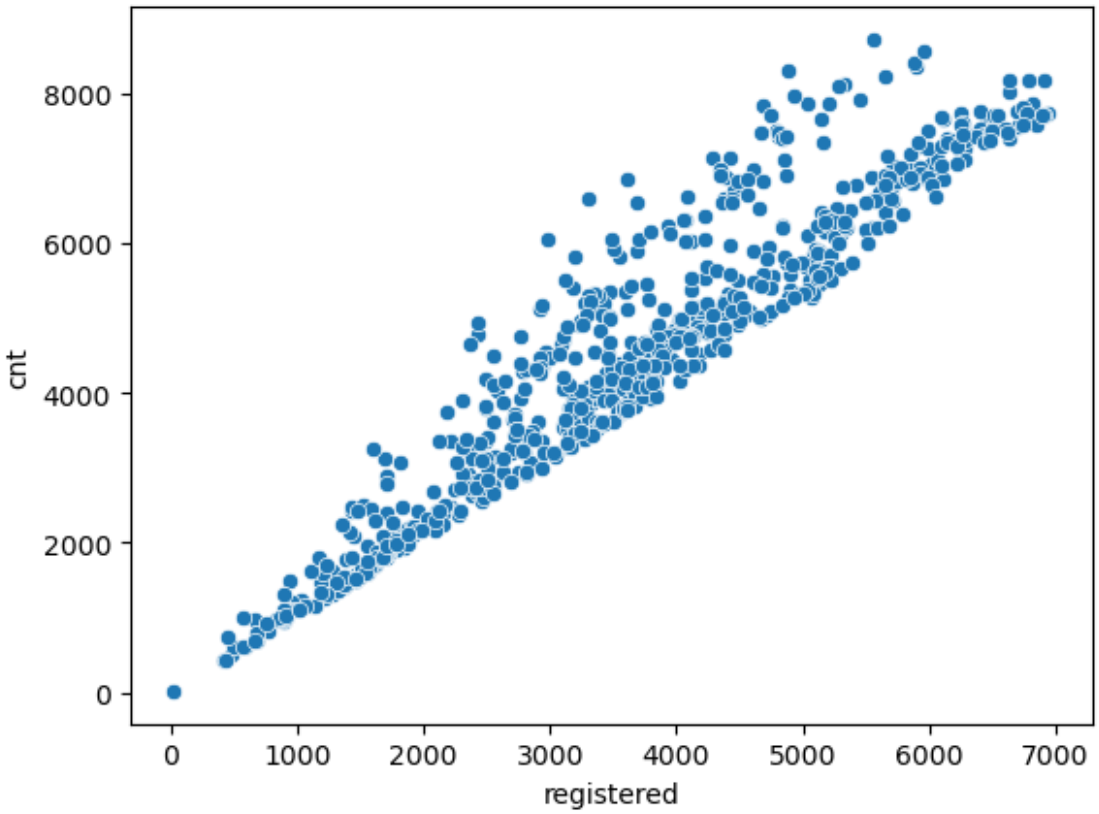

```
b.corr()["cnt"].sort_values(ascending = False)
```

```
cnt           1.000000
registered    0.945411
casual        0.672123
atemp         0.630685
instant       0.629896
temp          0.627044
yr            0.569728
season        0.404584
mnth          0.278191
```

```
weekday       0.036183
workingday   -0.027640
holiday      -0.068764
hum          -0.098543
windspeed    -0.235132
weathersit   -0.295929
Name: cnt, dtype: float64
```

```
sns.scatterplot(x = z["registered"], y = z["cnt"], data = z)
```

```
<Axes: xlabel='registered', ylabel='cnt'>
```




```
X = z["registered"]
Y = z["cnt"]

x_train, x_test, y_train, y_test = train_test_split(X, Y, train_size =
0.7, test_size = 0.3, random_state = 100)

x_train = np.array(x_train).reshape(-1, 1)
x_test = np.array(x_test).reshape(-1, 1)

y_train = np.array(y_train).reshape(-1, 1)
y_test = np.array(y_test).reshape(-1, 1)
```

```
n = LinearRegression()
n.fit(x_train, y_train)
```

```
LinearRegression()
```

```
y_predict_train = n.predict(x_train)
r2_train = r2_score(y_true = y_train, y_pred = y_predict_train)
```

```
round(r2_train, 2)*100
```

```
90.0
```

```
y_predict_test = n.predict(x_test)
r2_test = r2_score(y_true = y_test, y_pred = y_predict_test)
```

```
round(r2_test, 2)*100
```

```
88.0
```

```
res_train = y_train - y_predict_train
```

```
res_train
```

```
array([[-4.23700127e+02],
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       [-3.24003143e+02],
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       [-5.54194070e+02],
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       [ 1.35408340e+03],
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```

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```

```
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```
sns.distplot(res_train, kde = True)
```

```
<Axes: ylabel='Density'>
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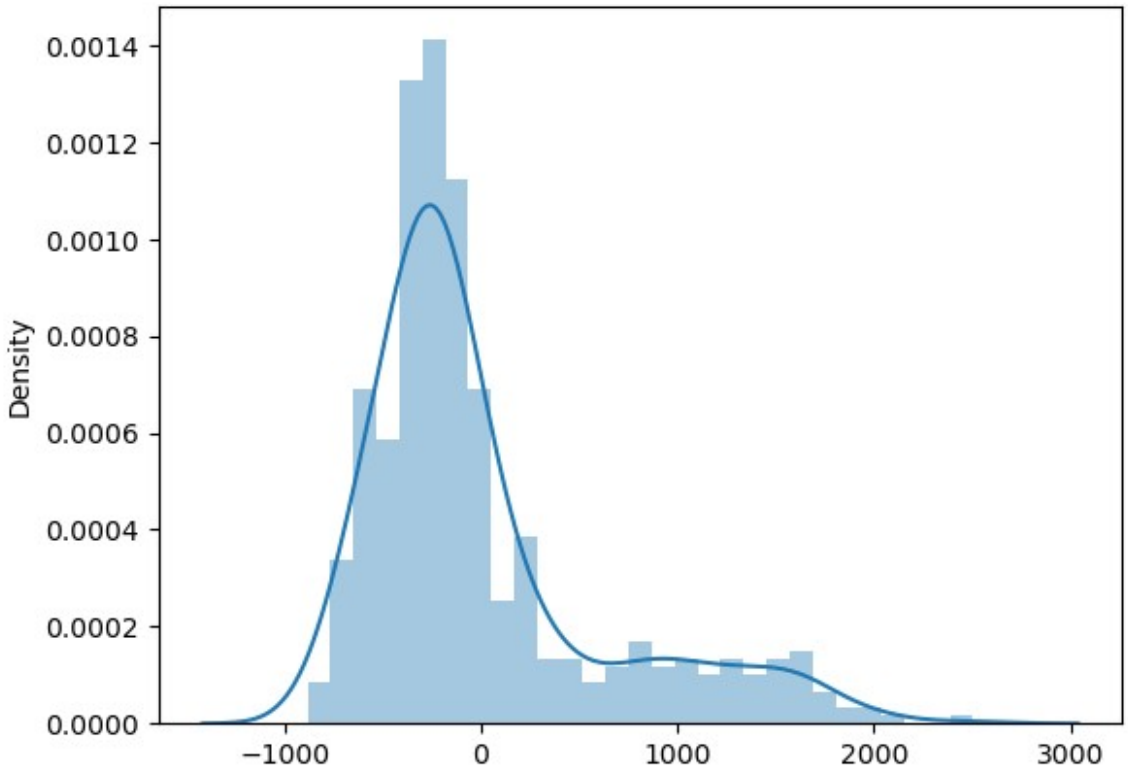


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res_test = y_test - y_predict_test

res_test
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sns.distplot(res_test, kde = True)

<Axes: ylabel='Density'>
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