Problem statement

predicting the house price in USA.To create a model to help him estimate of what the house would sell for.

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("Sleep_health")
```

To display top 10 rows

In [3]:

```
df.head(10)
```

Out[3]:

	Person ID	Gender	Age	Occupation	Sleep Duration	Quality of Sleep	Physical Activity Level	Stress Level	BMI Category	Blood Pressure	Heart Rate	Daily Steps	Sleep Disorder
0	1	Male	27	Software Engineer	6.1	6	42	6	Overweight	126/83	77	4200	None
1	2	Male	28	Doctor	6.2	6	60	8	Normal	125/80	75	10000	None
2	3	Male	28	Doctor	6.2	6	60	8	Normal	125/80	75	10000	None
3	4	Male	28	Sales Representative	5.9	4	30	8	Obese	140/90	85	3000	Sleep Apnea
4	5	Male	28	Sales Representative	5.9	4	30	8	Obese	140/90	85	3000	Sleep Apnea
5	6	Male	28	Software Engineer	5.9	4	30	8	Obese	140/90	85	3000	Insomnia
6	7	Male	29	Teacher	6.3	6	40	7	Obese	140/90	82	3500	Insomnia
7	8	Male	29	Doctor	7.8	7	75	6	Normal	120/80	70	8000	None
8	9	Male	29	Doctor	7.8	7	75	6	Normal	120/80	70	8000	None
9	10	Male	29	Doctor	7.8	7	75	6	Normal	120/80	70	8000	None

Data Cleaning And Pre-Processing

In [4]:

```python
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 374 entries, 0 to 373
Data columns (total 13 columns):
 #   Column                   Non-Null Count  Dtype  
---  ------                   --------------  -----  
 0   Person ID                374 non-null    int64  
 1   Gender                   374 non-null    object 
 2   Age                      374 non-null    int64  
 3   Occupation               374 non-null    object 
 4   Sleep Duration           374 non-null    float64
 5   Quality of Sleep         374 non-null    int64  
 6   Physical Activity Level  374 non-null    int64  
 7   Stress Level             374 non-null    int64  
 8   BMI Category             374 non-null    object 
 9   Blood Pressure           374 non-null    object 
 10  Heart Rate               374 non-null    int64  
 11  Daily Steps              374 non-null    int64  
 12  Sleep Disorder           374 non-null    object 
dtypes: float64(1), int64(7), object(5)
memory usage: 38.1+ KB
```

In [5]:

```python
# Display the statistical summary
df.describe()
```

Out[5]:

	Person ID	Age	Sleep Duration	Quality of Sleep	Physical Activity Level	Stress Level	Heart Rate	Daily Steps
count	374.000000	374.000000	374.000000	374.000000	374.000000	374.000000	374.000000	374.000000
mean	187.500000	42.184492	7.132086	7.312834	59.171123	5.385027	70.165775	6816.844920
std	108.108742	8.673133	0.795657	1.196956	20.830804	1.774526	4.135676	1617.915679
min	1.000000	27.000000	5.800000	4.000000	30.000000	3.000000	65.000000	3000.000000
25%	94.250000	35.250000	6.400000	6.000000	45.000000	4.000000	68.000000	5600.000000
50%	187.500000	43.000000	7.200000	7.000000	60.000000	5.000000	70.000000	7000.000000
75%	280.750000	50.000000	7.800000	8.000000	75.000000	7.000000	72.000000	8000.000000
max	374.000000	59.000000	8.500000	9.000000	90.000000	8.000000	86.000000	10000.000000

In [6]:

```
# To display the col headings
df.columns
```

Out[6]:

```
Index(['Person ID', 'Gender', 'Age', 'Occupation', 'Sleep Duration',
       'Quality of Sleep', 'Physical Activity Level', 'Stress Level',
       'BMI Category', 'Blood Pressure', 'Heart Rate', 'Daily Steps',
       'Sleep Disorder'],
      dtype='object')
```

In [7]:

```
cols=df.dropna(axis=1)
```

In [8]:

```
cols.columns
```

Out[8]:

```
Index(['Person ID', 'Gender', 'Age', 'Occupation', 'Sleep Duration',
       'Quality of Sleep', 'Physical Activity Level', 'Stress Level',
       'BMI Category', 'Blood Pressure', 'Heart Rate', 'Daily Steps',
       'Sleep Disorder'],
      dtype='object')
```

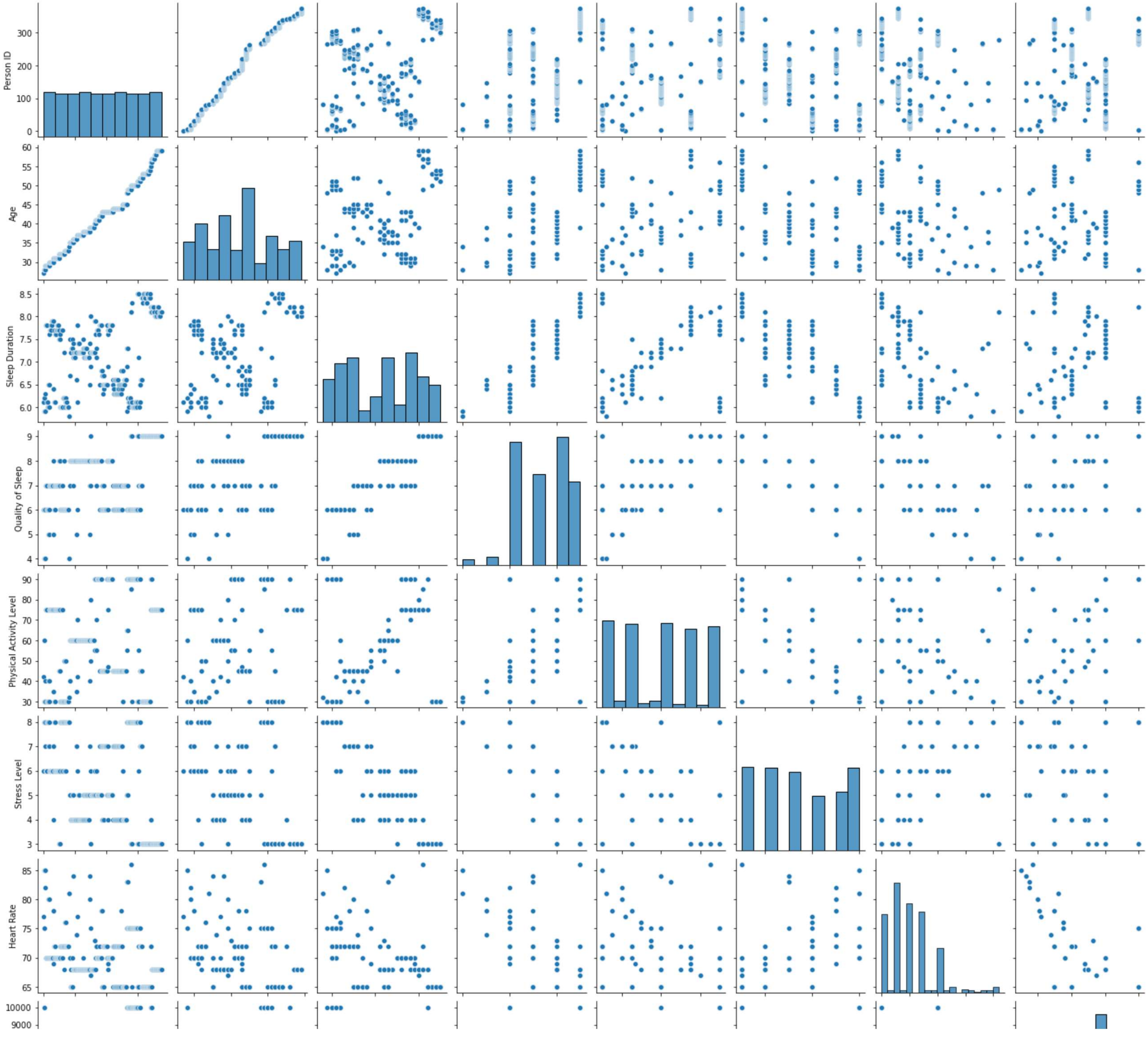
EDA and Visualization

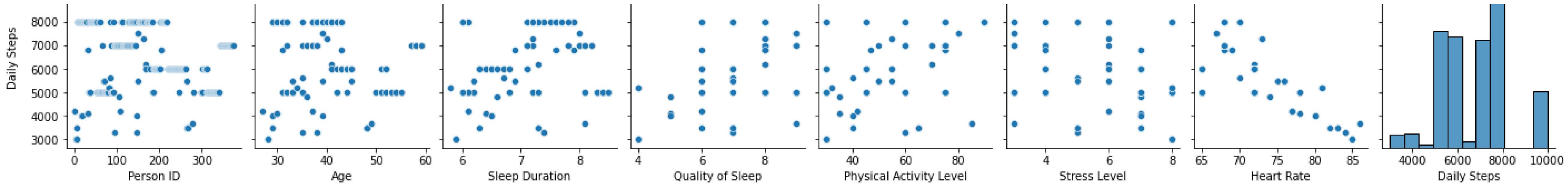
In [9]:

```
sns.pairplot(cols)
```

Out[9]:

```
<seaborn.axisgrid.PairGrid at 0x1a3b517c370>
```


Person ID
0
100
200
300
Age
30
35
40
45
50
55
60
Sleep Duration
6.0
6.5
7.0
7.5
8.0
8.5
Quality of Sleep
4
5
6
7
8
9
Physical Activity Level
30
40
50
60
70
80
90
Stress Level
3
4
5
6
7
8
Heart Rate
65
70
75
80
85
10000
9000

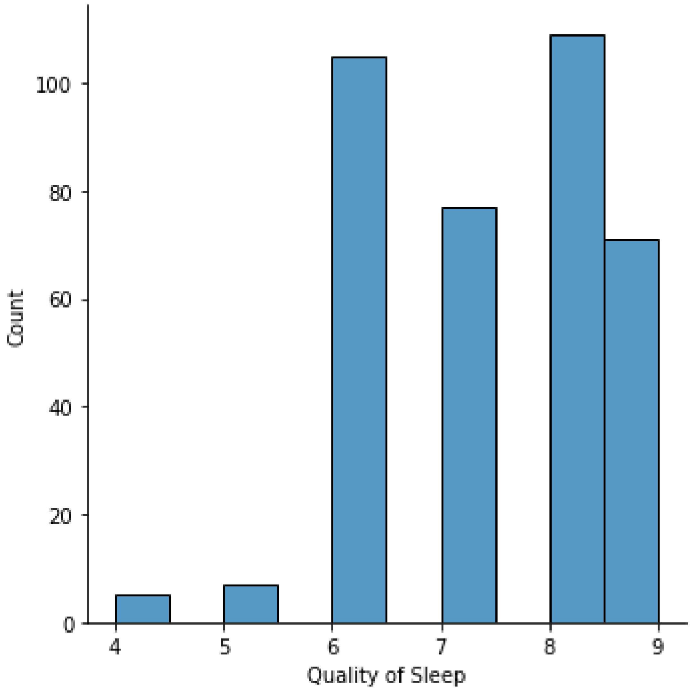


In [11]:

```
sns.displot(df['Quality of Sleep'])
```

Out[11]:

```
<seaborn.axisgrid.FacetGrid at 0x1a3b859d580>
```



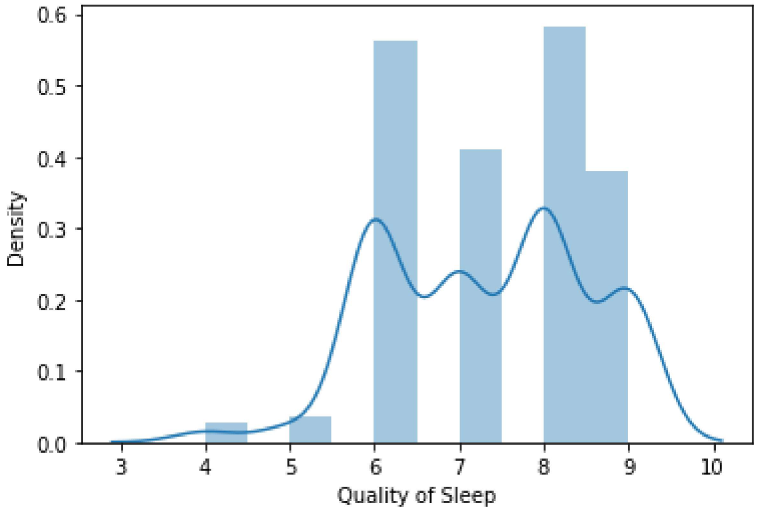
In [12]:

```
# We use displot in older version we get distplot use displot
sns.distplot(df['Quality of Sleep'])
```

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

Out[12]:

```
<AxesSubplot:xlabel='Quality of Sleep', ylabel='Density'>
```



```
In [13]:  df1=cols[['Quality of Sleep', 'Physical Activity Level', 'Stress Level']]
          df1
```

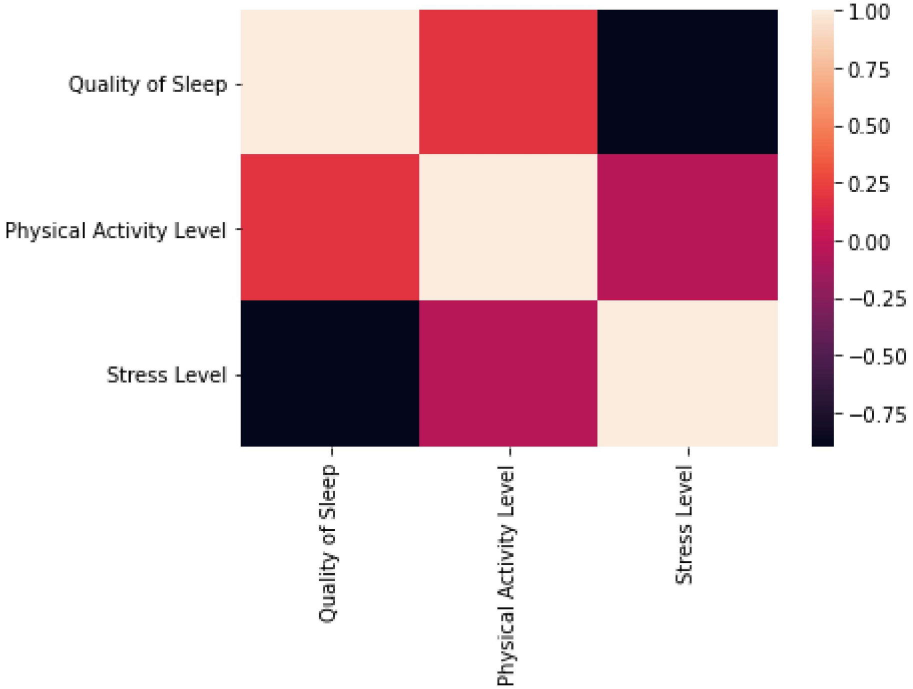
```
Out[13]:
           Quality of Sleep   Physical Activity Level   Stress Level
      0                   6                        42              6
      1                   6                        60              8
      2                   6                        60              8
      3                   4                        30              8
      4                   4                        30              8
    ...                 ...                       ...            ...
    369                   9                        75              3
    370                   9                        75              3
    371                   9                        75              3
    372                   9                        75              3
    373                   9                        75              3

374 rows × 3 columns
```

In [14]:

```
sns.heatmap(df1.corr())
```

Out[14]:

```
<AxesSubplot:>
```



To train the model - MODEL BUILD

Going to train linear regression model;We split our data into 2 variables x and y where x is independent var(input) and y is dependent on x(output), we could ignore address col as it is not required for our model

In [15]:

```
x=df1[['Quality of Sleep', 'Physical Activity Level', 'Stress Level']]
y=df1[['Quality of Sleep']]
```

To split the dataset into test data

In [16]:

```
# importing lib for splitting test data
from sklearn.model_selection import train_test_split
```

In [17]:

```
x_train,x_test,y_train,y_test = train_test_split(x,y,test_size=0.3)
```

In [18]:

```
from sklearn.linear_model import LinearRegression

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

Out[18]:

```
LinearRegression()
```

In [19]:

```
print(lr.intercept_)
```

```
[-3.55271368e-15]
```

In [20]:

```
print(lr.score(x_test,y_test))
```

```
1.0
```

In [21]:

```
coeff=pd.DataFrame(lr.coef_)
coeff
```

Out[21]:

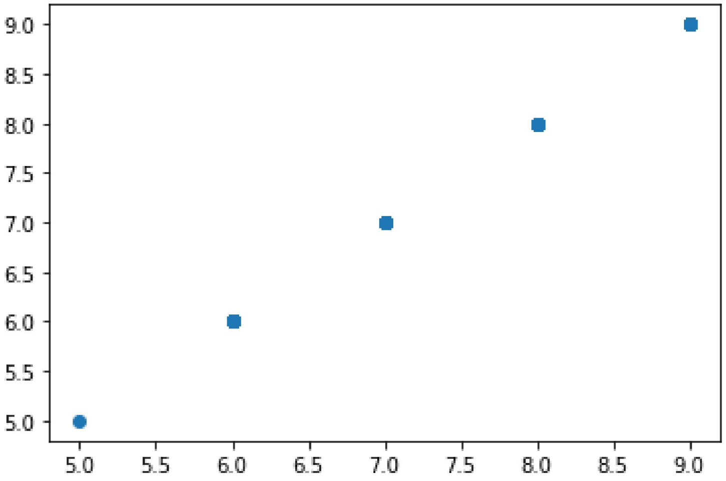
	0	1	2
0	1.0	1.996509e-17	1.833738e-16

In [22]:

```
pred = lr.predict(x_test)
plt.scatter(y_test,pred)
```

Out[22]:

```
<matplotlib.collections.PathCollection at 0x1a3ba9d7e20>
```



In [23]:

```
from sklearn.linear_model import Ridge,Lasso
```

In [24]:

```
rr=Ridge(alpha=10)
rr.fit(x_train,y_train)
```

Out[24]:

```
Ridge(alpha=10)
```

In [25]:

```
rr.score(x_test,y_test)
```

Out[25]:

```
0.9977455494035959
```

In [26]:

```
la=Lasso(alpha=10)
la.fit(x_train,y_train)
```

Out[26]:

```
Lasso(alpha=10)
```

In [27]:

```
la.score(x_test,y_test)
```

Out[27]:

```
-0.008246215885797215
```

In [ ]:

```
```