# D3

In [2]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
```

In [24]:
```
df=pd.read_csv(r"C:\Users\user\Downloads\4_drug200.csv")
df
```

Out[24]:

| | Age | Sex | BP | Cholesterol | Na_to_K | Drug |
|---|---|---|---|---|---|---|
| **0** | 23 | F | HIGH | HIGH | 25.355 | drugY |
| **1** | 47 | M | LOW | HIGH | 13.093 | drugC |
| **2** | 47 | M | LOW | HIGH | 10.114 | drugC |
| **3** | 28 | F | NORMAL | HIGH | 7.798 | drugX |
| **4** | 61 | F | LOW | HIGH | 18.043 | drugY |
| **...** | ... | ... | ... | ... | ... | ... |
| **195** | 56 | F | LOW | HIGH | 11.567 | drugC |
| **196** | 16 | M | LOW | HIGH | 12.006 | drugC |
| **197** | 52 | M | NORMAL | HIGH | 9.894 | drugX |
| **198** | 23 | M | NORMAL | NORMAL | 14.020 | drugX |
| **199** | 40 | F | LOW | NORMAL | 11.349 | drugX |

200 rows × 6 columns

In [26]:
```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 200 entries, 0 to 199
Data columns (total 6 columns):
 #   Column       Non-Null Count  Dtype  
---  ------       --------------  -----  
 0   Age          200 non-null    int64  
 1   Sex          200 non-null    object 
 2   BP           200 non-null    object 
 3   Cholesterol  200 non-null    object 
 4   Na_to_K      200 non-null    float64
 5   Drug         200 non-null    object 
dtypes: float64(1), int64(1), object(4)
memory usage: 9.5+ KB
```

In [27]:
```
df.describe()
```

Out[27]:

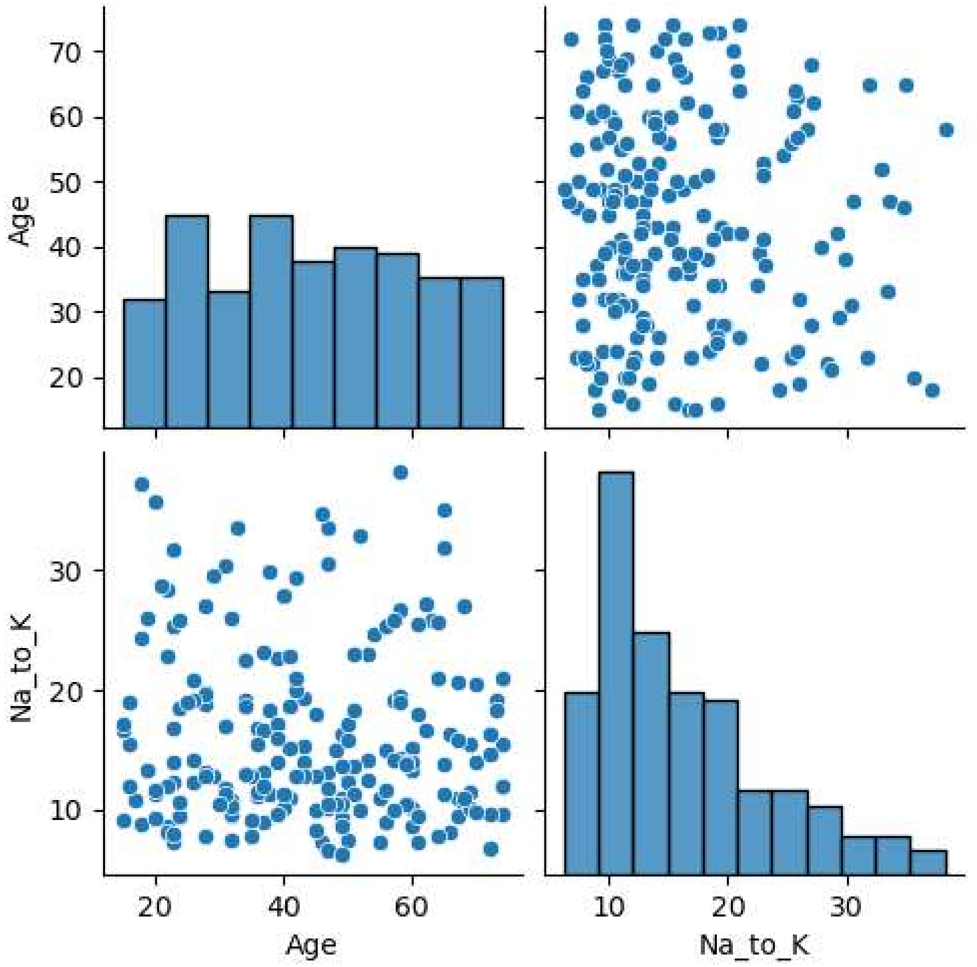
|  | Age | Na_to_K |
|---|---|---|
| **count** | 200.000000 | 200.000000 |
| **mean** | 44.315000 | 16.084485 |
| **std** | 16.544315 | 7.223956 |
| **min** | 15.000000 | 6.269000 |
| **25%** | 31.000000 | 10.445500 |
| **50%** | 45.000000 | 13.936500 |
| **75%** | 58.000000 | 19.380000 |
| **max** | 74.000000 | 38.247000 |

In [28]:
```
df.columns
```

Out[28]:
```
Index(['Age', 'Sex', 'BP', 'Cholesterol', 'Na_to_K', 'Drug'], dtype='object')
```

In [29]:
```
sns.pairplot(df)
```

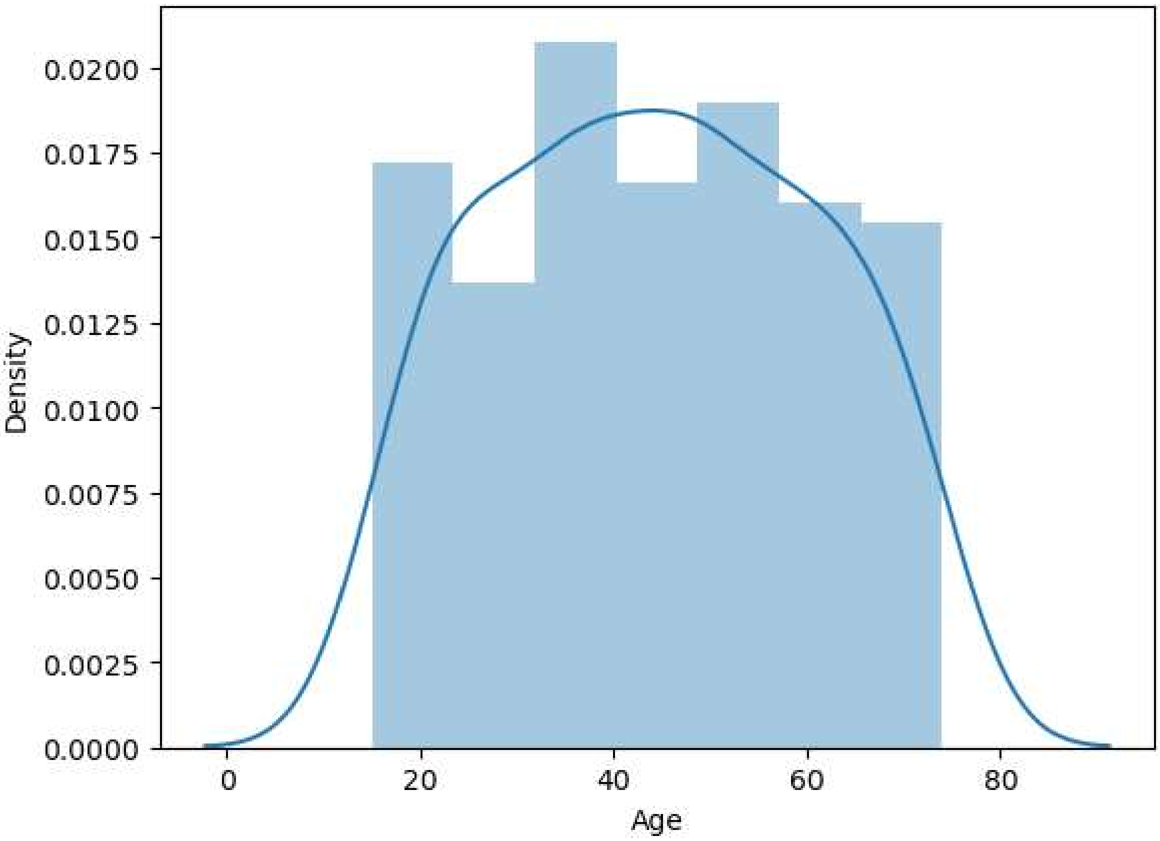
Out[29]:
```
<seaborn.axisgrid.PairGrid at 0x21194abf3d0>
```



In [30]:
```
sns.distplot(df["Age"])
```

```
C:\Users\user\AppData\Local\Temp\ipykernel_7116\2732350774.py: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 (https://gis
t.github.com/mwaskom/de44147ed2974457ad6372750bbe5751)

  sns.distplot(df["Age"])
```

Out[30]:
```
<Axes: xlabel='Age', ylabel='Density'>
```

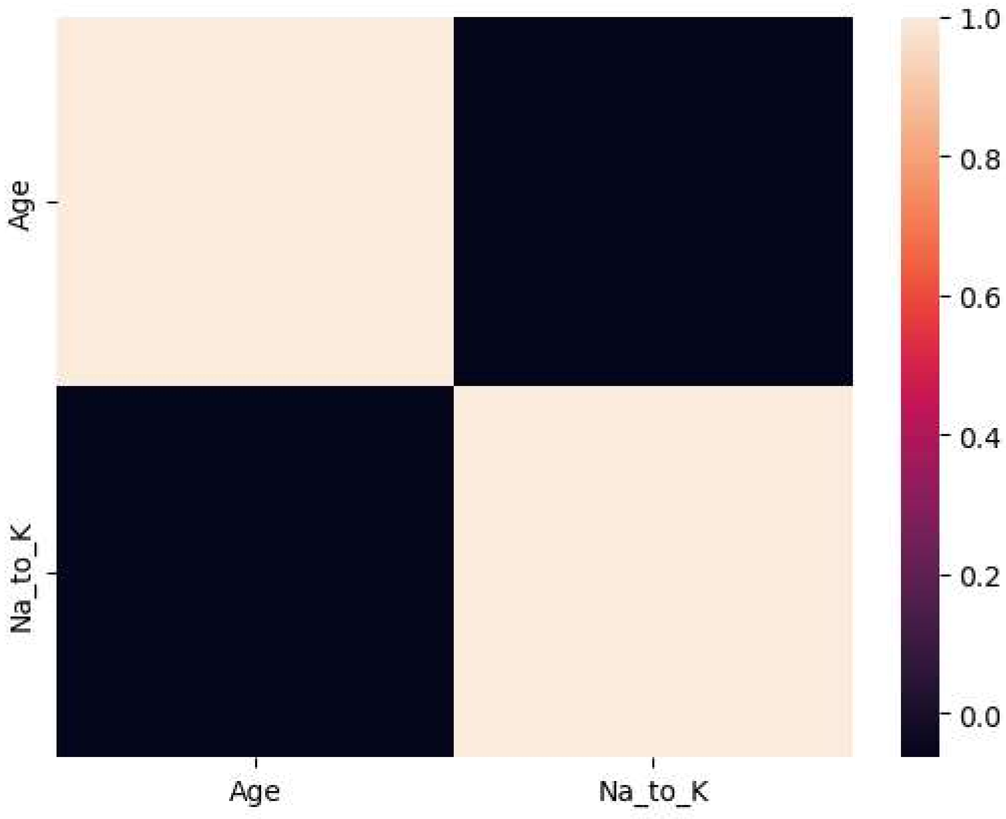


In [34]:
```
df1=df[['Age', 'Sex', 'BP', 'Cholesterol', 'Na_to_K', 'Drug']]
```

In [35]:
```
sns.heatmap(df1.corr())
```

```
C:\Users\user\AppData\Local\Temp\ipykernel_7116\781785195.py:1: FutureWarnin
g: The default value of numeric_only in DataFrame.corr is deprecated. In a fu
ture version, it will default to False. Select only valid columns or specify
the value of numeric_only to silence this warning.
  sns.heatmap(df1.corr())
```

Out[35]:
```
<Axes: >
```



In [36]:
```
x=df1[['Age']]
y=df1['Na_to_K']
```

In [37]:
```
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 [38]:
```
from sklearn.linear_model import LinearRegression
lr=LinearRegression()
lr.fit(x_train,y_train)
```

Out[38]:
```
▾ LinearRegression
LinearRegression()
```

In [39]:
```
print(lr.intercept_)
```

```
16.179442600555902
```

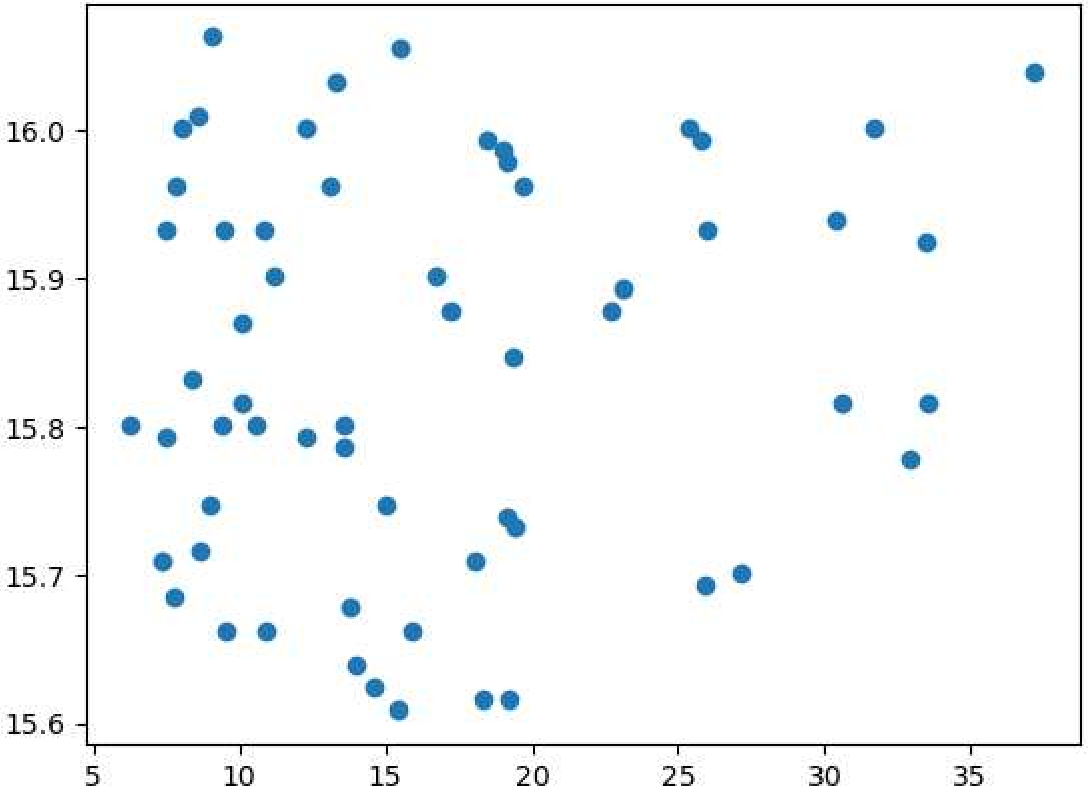
In [40]:
```
coeff = pd.DataFrame(lr.coef_,x.columns,columns=['Co-efficient'])
coeff
```

Out[40]:

|  | Co-efficient |
|---|---|
| **Age** | -0.007718 |

In [41]:
```
prediction=lr.predict(x_test)
plt.scatter(y_test,prediction)
```

Out[41]:
```
<matplotlib.collections.PathCollection at 0x2118d1d9a90>
```



In [42]:
```
print(lr.score(x_test,y_test))
```

```
-0.006063085203735996
```

In [ ]: