РК ИУ5-61Б Андреев А.В.

In [1]:

```
import numpy as np
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt
from pandas.plotting import scatter_matrix
import warnings
from sklearn import datasets
from sklearn.datasets import load_iris
from sklearn import linear_model
from sklearn.cluster import KMeans
from sklearn import metrics
from pandas import DataFrame
%pylab inline
```

```
Populating the interactive namespace from numpy and matplotlib
```

In [2]:

```
boston = load_iris()
data = pd.DataFrame(boston.data, columns=boston.feature_names)
data['TARGET'] = boston.target
```

In [3]:

```
data.head()
```

Out[3]:

	sepal length (cm)	sepal width (cm)	petal length (cm)	petal width (cm)	TARGET
0	5.1	3.5	1.4	0.2	0
1	4.9	3.0	1.4	0.2	0
2	4.7	3.2	1.3	0.2	0
3	4.6	3.1	1.5	0.2	0
4	5.0	3.6	1.4	0.2	0

In [4]:

```
data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 150 entries, 0 to 149
Data columns (total 5 columns):
 #   Column             Non-Null Count  Dtype  
---  ------             --------------  -----  
 0   sepal length (cm)  150 non-null    float64
 1   sepal width (cm)   150 non-null    float64
 2   petal length (cm)  150 non-null    float64
 3   petal width (cm)   150 non-null    float64
 4   TARGET             150 non-null    int32  
dtypes: float64(4), int32(1)
memory usage: 5.4 KB
```

In [5]:

```
data.describe()
```

Out[5]:

	sepal length (cm)	sepal width (cm)	petal length (cm)	petal width (cm)	TARGET
count	150.000000	150.000000	150.000000	150.000000	150.000000
mean	5.843333	3.057333	3.758000	1.199333	1.000000
std	0.828066	0.435866	1.765298	0.762238	0.819232
min	4.300000	2.000000	1.000000	0.100000	0.000000
25%	5.100000	2.800000	1.600000	0.300000	0.000000
50%	5.800000	3.000000	4.350000	1.300000	1.000000
75%	6.400000	3.300000	5.100000	1.800000	2.000000
max	7.900000	4.400000	6.900000	2.500000	2.000000

In [6]:

```
corr_matrix = data.corr()
```

In [7]:

```
corr_matrix['TARGET']
```

Out[7]:

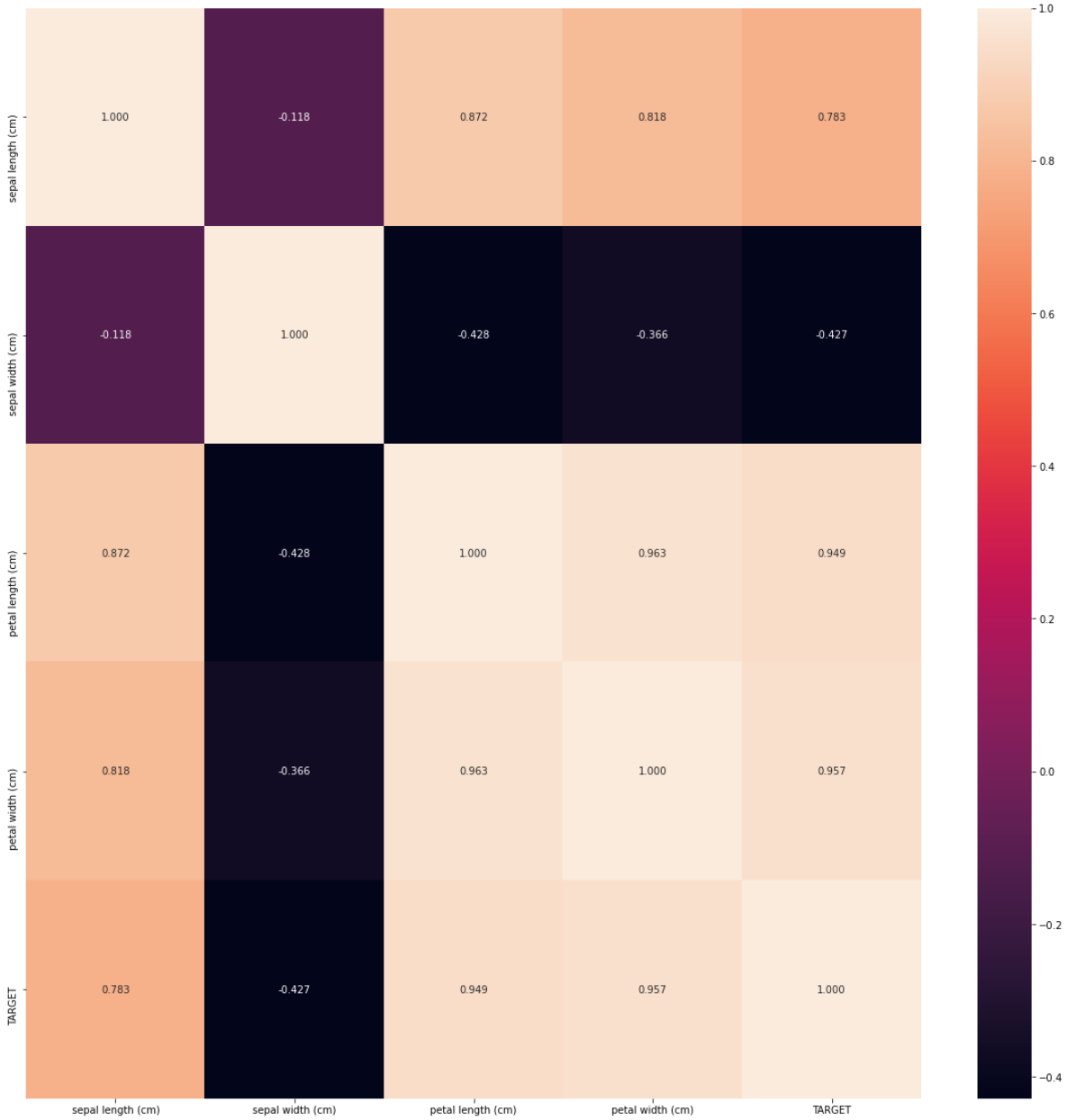
```
sepal length (cm)    0.782561
sepal width (cm)    -0.426658
petal length (cm)    0.949035
petal width (cm)     0.956547
TARGET               1.000000
Name: TARGET, dtype: float64
```

In [8]:

```
plt.figure(figsize=(20,20))
sns.heatmap(corr_matrix, annot=True, fmt='.3f')
```

Out[8]:

<AxesSubplot:>



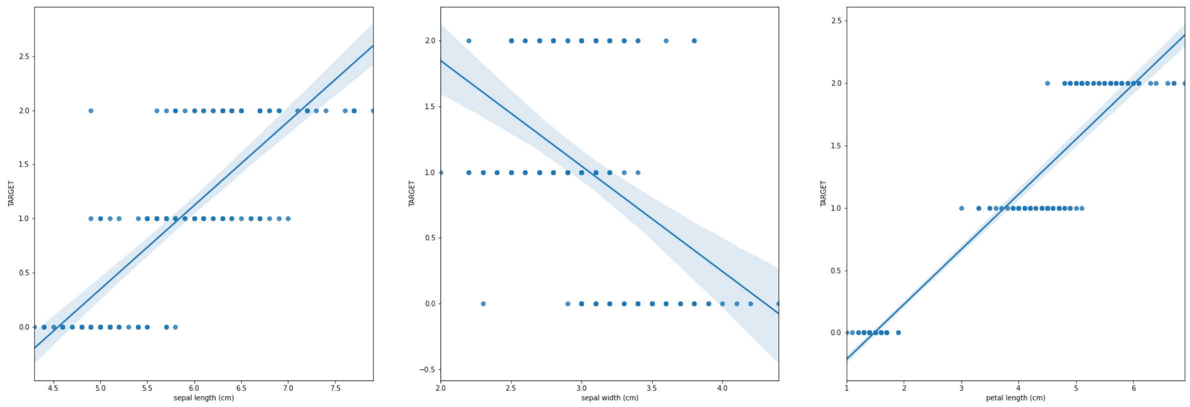
In [9]:

```
fig, axs = plt.subplots(ncols=3, figsize=(30,10))
sns.regplot(data['sepal length (cm)'], data['TARGET'], ax = axs[0])
sns.regplot(data['sepal width (cm)'], data['TARGET'], ax = axs[1])
sns.regplot(data['petal length (cm)'], data['TARGET'], ax = axs[2])
```

```
D:\Program Files\Anaconda3\lib\site-packages\seaborn\_decorators.py:36: Futu
reWarning: Pass the following variables as keyword args: x, y. From version
0.12, the only valid positional argument will be `data`, and passing other a
rguments without an explicit keyword will result in an error or misinterpret
ation.
  warnings.warn(
D:\Program Files\Anaconda3\lib\site-packages\seaborn\_decorators.py:36: Futu
reWarning: Pass the following variables as keyword args: x, y. From version
0.12, the only valid positional argument will be `data`, and passing other a
rguments without an explicit keyword will result in an error or misinterpret
ation.
  warnings.warn(
D:\Program Files\Anaconda3\lib\site-packages\seaborn\_decorators.py:36: Futu
reWarning: Pass the following variables as keyword args: x, y. From version
0.12, the only valid positional argument will be `data`, and passing other a
rguments without an explicit keyword will result in an error or misinterpret
ation.
  warnings.warn(
```

Out[9]:

```
<AxesSubplot:xlabel='petal length (cm)', ylabel='TARGET'>
```



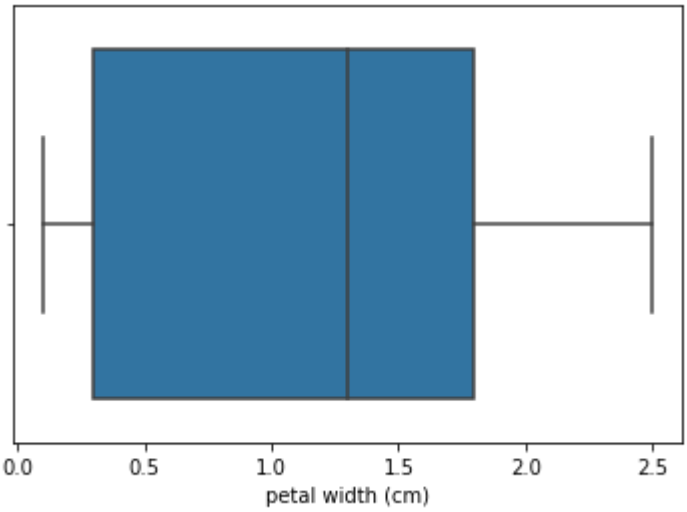
In [10]:

```
sns.boxplot(data['petal width (cm)'])
```

```
D:\Program Files\Anaconda3\lib\site-packages\seaborn\_decorators.py:36: Futu
reWarning: Pass the following variable as a keyword arg: x. From version 0.1
2, the only valid positional argument will be `data`, and passing other argu
ments without an explicit keyword will result in an error or misinterpretati
on.
  warnings.warn(
```

Out[10]:

```
<AxesSubplot:xlabel='petal width (cm)'>
```



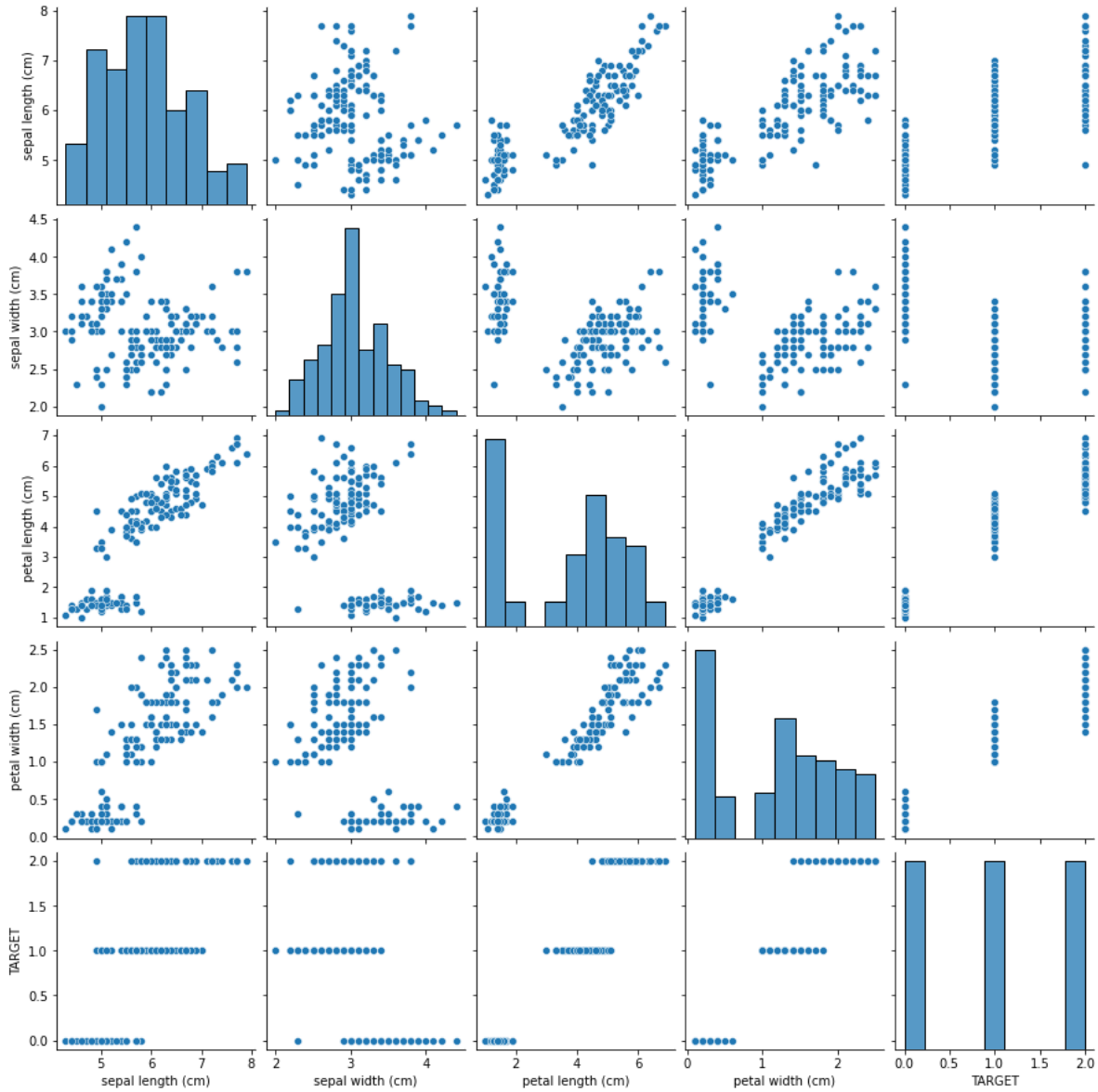
In [11]:

```
plt.figure(figsize=(12,6))
sns.pairplot(data)
```

Out[11]:

```
<seaborn.axisgrid.PairGrid at 0x29c80726d30>
```

```
<Figure size 864x432 with 0 Axes>
```

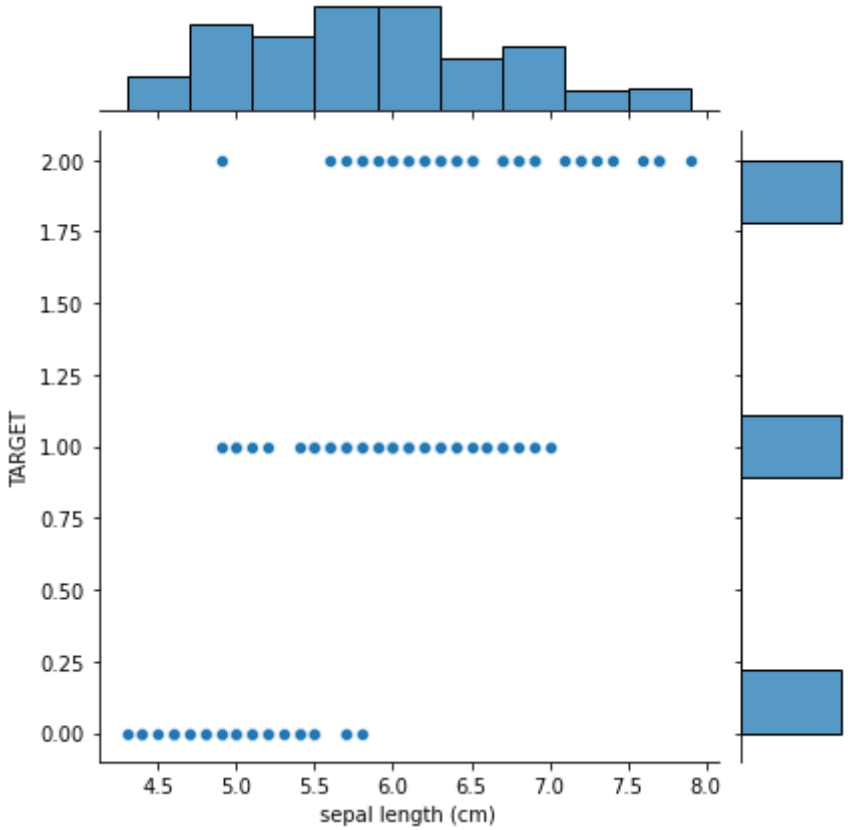


In [12]:

```
sns.jointplot(x = "sepal length (cm)", y = "TARGET", kind="scatter", data = data)
```

Out[12]:

<seaborn.axisgrid.JointGrid at 0x29c8065a7f0>



In [13]:

```
fig, ax = plt.subplots(figsize=(10,10))
sns.scatterplot(ax=ax, x='sepal length (cm)', y='TARGET', data=data, hue='sepal width (cm)'
```

Out[13]:

```
<AxesSubplot:xlabel='sepal length (cm)', ylabel='TARGET'>
```