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

In [4]:
```
filepath = "C:\\Users\\Dell\\OneDrive - bjoz\\Desktop\\Machine Learning\\Data
```

In [5]:
```
df = pd.read_csv(filepath)
```

In [12]:
```
df.columns = ["sepal_length","sepal_width","petal_length","petal_width","targe
```

In [13]:
```
df.tail()
```

Out[13]:

	sepal_length	sepal_width	petal_length	petal_width	target
144	6.7	3.0	5.2	2.3	Iris-virginica
145	6.3	2.5	5.0	1.9	Iris-virginica
146	6.5	3.0	5.2	2.0	Iris-virginica
147	6.2	3.4	5.4	2.3	Iris-virginica
148	5.9	3.0	5.1	1.8	Iris-virginica

In [14]:
```
df
```

Out[14]:

	sepal_length	sepal_width	petal_length	petal_width	target
0	4.9	3.0	1.4	0.2	Iris-setosa
1	4.7	3.2	1.3	0.2	Iris-setosa
2	4.6	3.1	1.5	0.2	Iris-setosa
3	5.0	3.6	1.4	0.2	Iris-setosa
4	5.4	3.9	1.7	0.4	Iris-setosa
...	...	...	...	...	...
144	6.7	3.0	5.2	2.3	Iris-virginica
145	6.3	2.5	5.0	1.9	Iris-virginica
146	6.5	3.0	5.2	2.0	Iris-virginica
147	6.2	3.4	5.4	2.3	Iris-virginica
148	5.9	3.0	5.1	1.8	Iris-virginica

149 rows × 5 columns

In [15]:
```
df.columns
```

Out[15]:
```
Index(['sepal_length', 'sepal_width', 'petal_length', 'petal_width', 'targe
t'], dtype='object')
```

In [16]:
```
df.head()
```

Out[16]:

	sepal_length	sepal_width	petal_length	petal_width	target
0	4.9	3.0	1.4	0.2	Iris-setosa
1	4.7	3.2	1.3	0.2	Iris-setosa
2	4.6	3.1	1.5	0.2	Iris-setosa
3	5.0	3.6	1.4	0.2	Iris-setosa
4	5.4	3.9	1.7	0.4	Iris-setosa

In [19]:
```
df.target.replace({"Iris-setosa":"setosa","Iris-versicolor":"versicolor","Iris
```

Out[19]:
```
0         setosa
1         setosa
2         setosa
3         setosa
4         setosa
         ...
144    virginica
145    virginica
146    virginica
147    virginica
148    virginica
Name: target, Length: 149, dtype: object
```

In [18]:
```
df.target.unique()
```

Out[18]:
```
array(['Iris-setosa', 'Iris-versicolor', 'Iris-virginica'], dtype=object)
```

In [21]:
```
df.target.replace({"Iris-setosa":"setosa","Iris-versicolor":"versicolor","Iris
```

In [22]:
```
df.head()
```

Out[22]:

	sepal_length	sepal_width	petal_length	petal_width	target
0	4.9	3.0	1.4	0.2	setosa
1	4.7	3.2	1.3	0.2	setosa
2	4.6	3.1	1.5	0.2	setosa
3	5.0	3.6	1.4	0.2	setosa
4	5.4	3.9	1.7	0.4	setosa

In [23]:
```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 149 entries, 0 to 148
Data columns (total 5 columns):
 #   Column        Non-Null Count  Dtype  
---  ------        --------------  -----  
 0   sepal_length  149 non-null    float64
 1   sepal_width   149 non-null    float64
 2   petal_length  149 non-null    float64
 3   petal_width   149 non-null    float64
 4   target        149 non-null    object 
dtypes: float64(4), object(1)
memory usage: 5.9+ KB
```

In [24]:
```
df.target.replace({""})
```

Out[24]:
```
0         setosa
1         setosa
2         setosa
3         setosa
4         setosa
          ...
144    virginica
145    virginica
146    virginica
147    virginica
148    virginica
Name: target, Length: 149, dtype: object
```

EDA

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

Out[26]:

	sepal_length	sepal_width	petal_length	petal_width
count	149.000000	149.000000	149.000000	149.000000
mean	5.848322	3.051007	3.774497	1.205369
std	0.828594	0.433499	1.759651	0.761292
min	4.300000	2.000000	1.000000	0.100000
25%	5.100000	2.800000	1.600000	0.300000
50%	5.800000	3.000000	4.400000	1.300000
75%	6.400000	3.300000	5.100000	1.800000
max	7.900000	4.400000	6.900000	2.500000

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

Out[27]:

	sepal_length	sepal_width	petal_length	petal_width
sepal_length	1.000000	-0.103784	0.871283	0.816971
sepal_width	-0.103784	1.000000	-0.415218	-0.350733
petal_length	0.871283	-0.415218	1.000000	0.962314
petal_width	0.816971	-0.350733	0.962314	1.000000

In [28]:
```
df.target.value_counts()
```

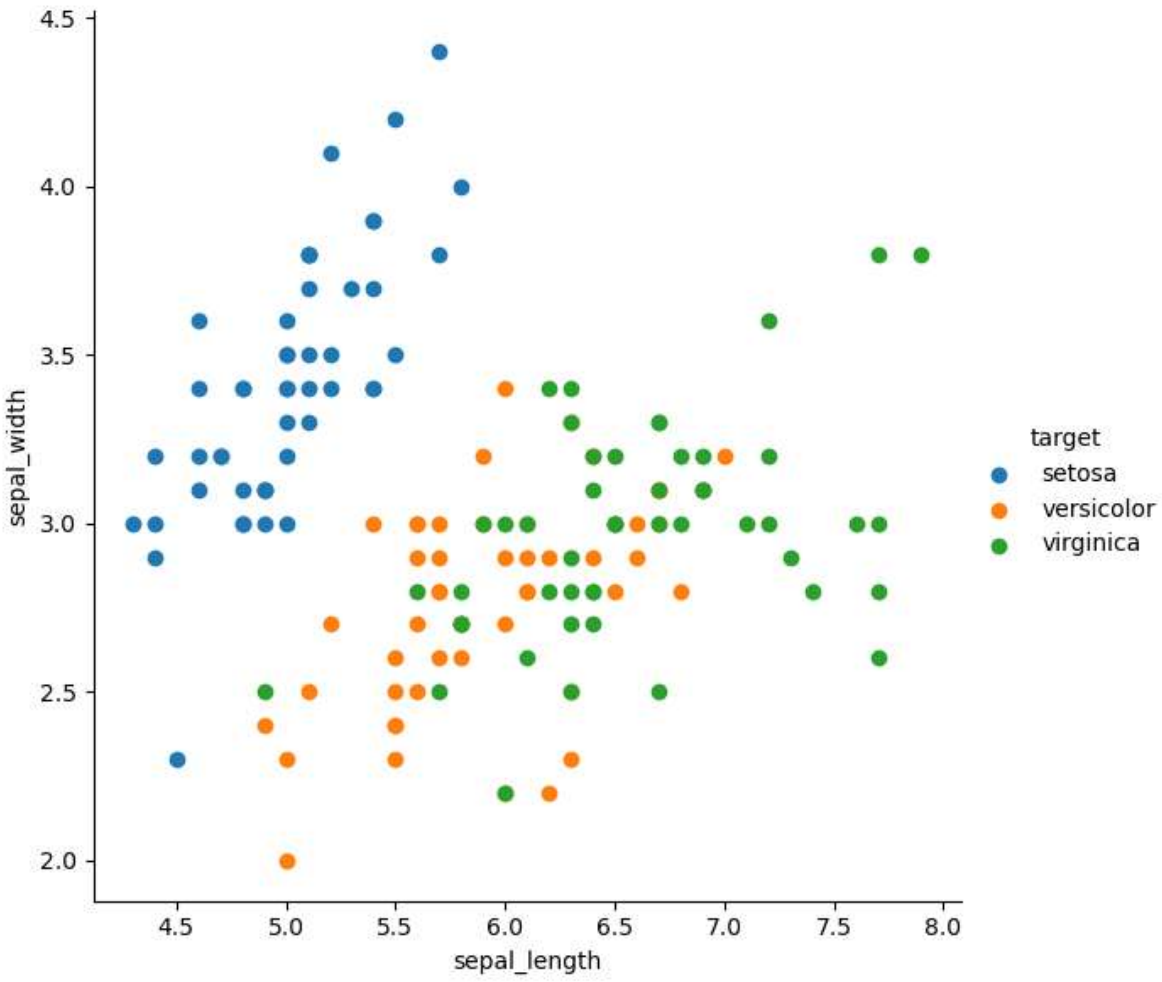
Out[28]:
```
versicolor    50
virginica     50
setosa        49
Name: target, dtype: int64
```

2D Scatterplot

In [35]:
```
sns.FacetGrid(df,hue="target",size=6).map(plt.scatter,"sepal_length","sepal_wi
```

```
C:\Users\Dell\anaconda\lib\site-packages\seaborn\axisgrid.py:337: UserWarnin
g: The `size` parameter has been renamed to `height`; please update your cod
e.
  warnings.warn(msg, UserWarning)
```

Out[35]:
```
<seaborn.axisgrid.FacetGrid at 0x27a70148a30>
```



In [40]:
```
sns.FacetGrid(df,hue="target",height=6).map(plt.scatter,"sepal_length","sepal_
```

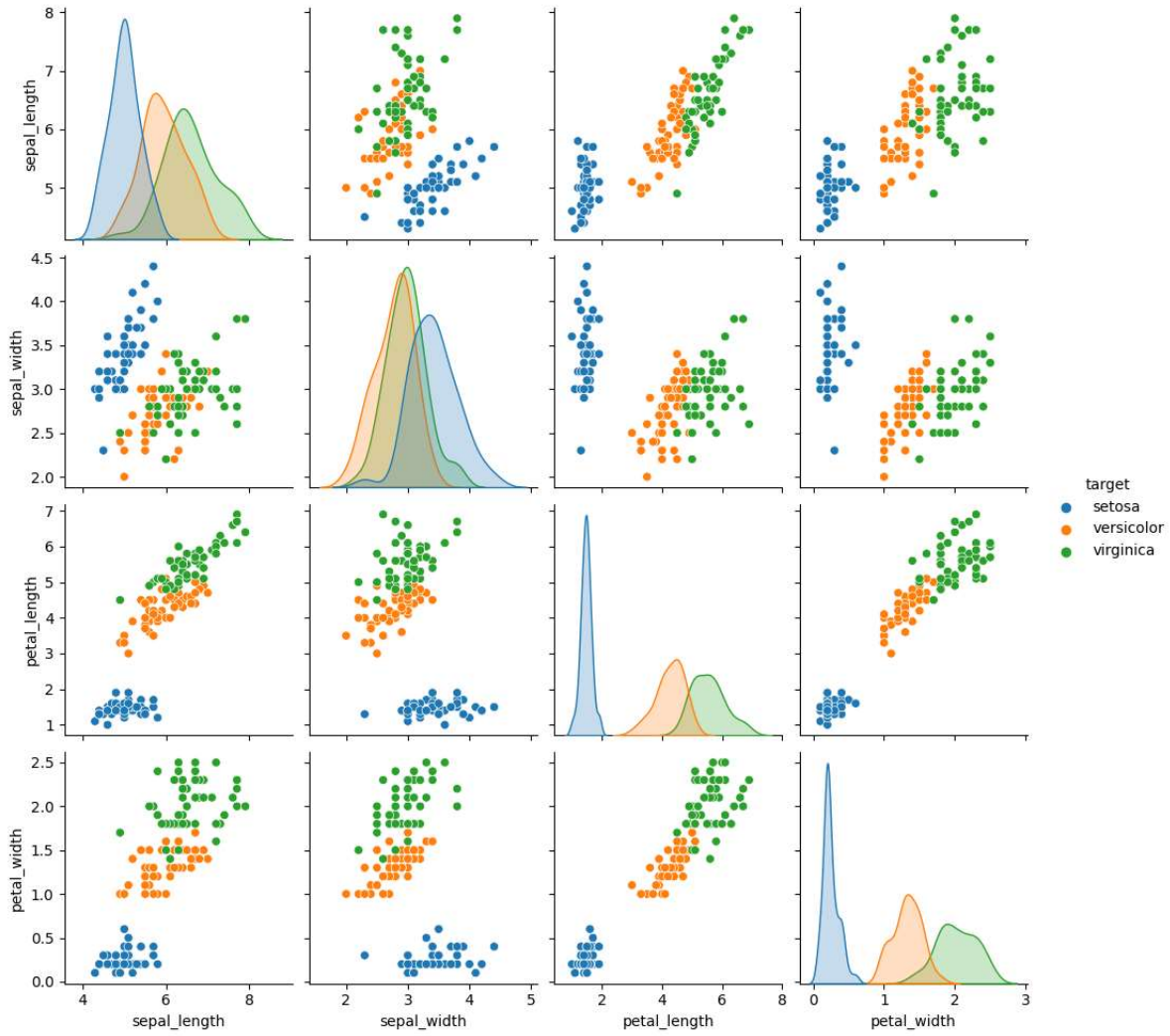
Out[44]:
```
<seaborn.axisgrid.FacetGrid at 0x27a70ab00a0>
```

Pairplot

In [53]:
```
sns.pairplot(df,hue="target")
```

Out[53]:
```
<seaborn.axisgrid.PairGrid at 0x27a712357c0>
```

In [54]:
```
plt.show()
```



Histogram

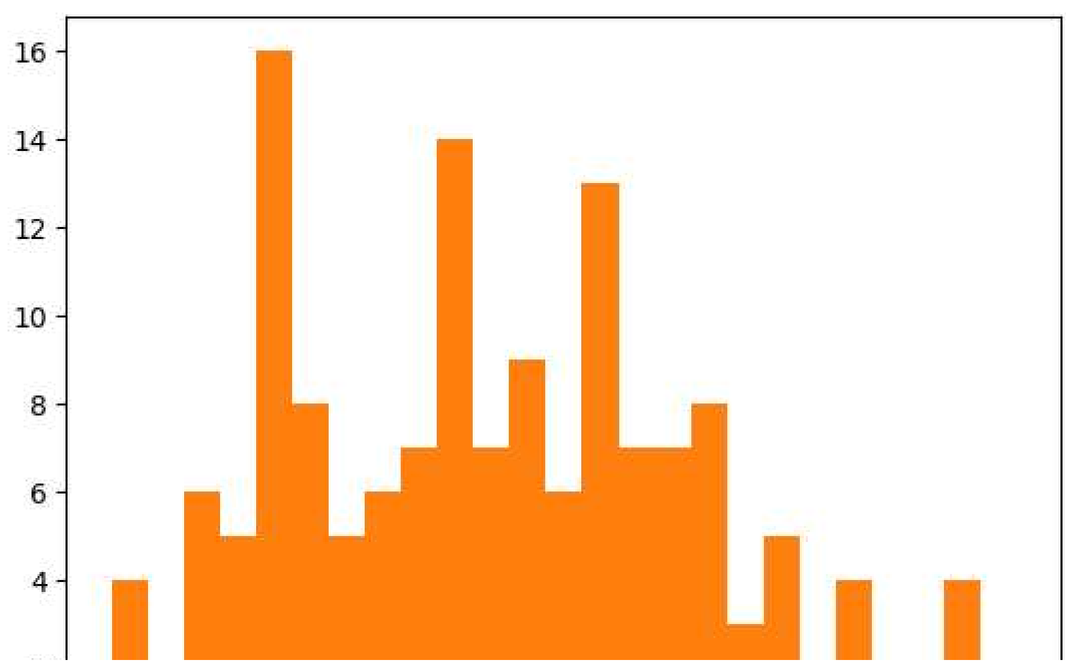
In [56]:
```
plt.hist(df["sepal_length"],bins=25);
```

In [59]:
```
sns.FacetGrid(df, hue="target", size=8).map(sns.distplot)
```

```
C:\Users\Dell\anaconda\lib\site-packages\seaborn\distributions.py:2619: Futur
eWarning: `distplot` is a deprecated function and will be removed in a future
version. Please adapt your code to use either `displot` (a figure-level funct
ion with similar flexibility) or `histplot` (an axes-level function for histo
grams).
  warnings.warn(msg, FutureWarning)
C:\Users\Dell\anaconda\lib\site-packages\numpy\lib\histograms.py:906: Runtime
Warning: invalid value encountered in true_divide
  return n/db/n.sum(), bin_edges
C:\Users\Dell\anaconda\lib\site-packages\seaborn\distributions.py:2619: Futur
eWarning: `distplot` is a deprecated function and will be removed in a future
version. Please adapt your code to use either `displot` (a figure-level funct
ion with similar flexibility) or `histplot` (an axes-level function for histo
grams).
  warnings.warn(msg, FutureWarning)
C:\Users\Dell\anaconda\lib\site-packages\numpy\lib\histograms.py:906: Runtime
Warning: invalid value encountered in true_divide
  return n/db/n.sum(), bin_edges
C:\Users\Dell\anaconda\lib\site-packages\seaborn\distributions.py:2619: Futur
eWarning: `distplot` is a deprecated function and will be removed in a future
version. Please adapt your code to use either `displot` (a figure-level funct
ion with similar flexibility) or `histplot` (an axes-level function for histo
grams).
  warnings.warn(msg, FutureWarning)
C:\Users\Dell\anaconda\lib\site-packages\numpy\lib\histograms.py:906: Runtime
Warning: invalid value encountered in true_divide
  return n/db/n.sum(), bin_edges
```

Out[59]: <seaborn.axisgrid.FacetGrid at 0x27a76040190>

In [60]:
```
plt.show()
```



In [63]:
```
sns.FacetGrid(df, hue="target", height=8).map(sns.distplot, "petal_width").add
```

```
C:\Users\Dell\anaconda\lib\site-packages\seaborn\distributions.py:2619: Futur
eWarning: `distplot` is a deprecated function and will be removed in a future
version. Please adapt your code to use either `displot` (a figure-level funct
ion with similar flexibility) or `histplot` (an axes-level function for histo
grams).
  warnings.warn(msg, FutureWarning)
C:\Users\Dell\anaconda\lib\site-packages\seaborn\distributions.py:2619: Futur
eWarning: `distplot` is a deprecated function and will be removed in a future
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grams).
  warnings.warn(msg, FutureWarning)
C:\Users\Dell\anaconda\lib\site-packages\seaborn\distributions.py:2619: Futur
eWarning: `distplot` is a deprecated function and will be removed in a future
version. Please adapt your code to use either `displot` (a figure-level funct
ion with similar flexibility) or `histplot` (an axes-level function for histo
grams).
  warnings.warn(msg, FutureWarning)
```
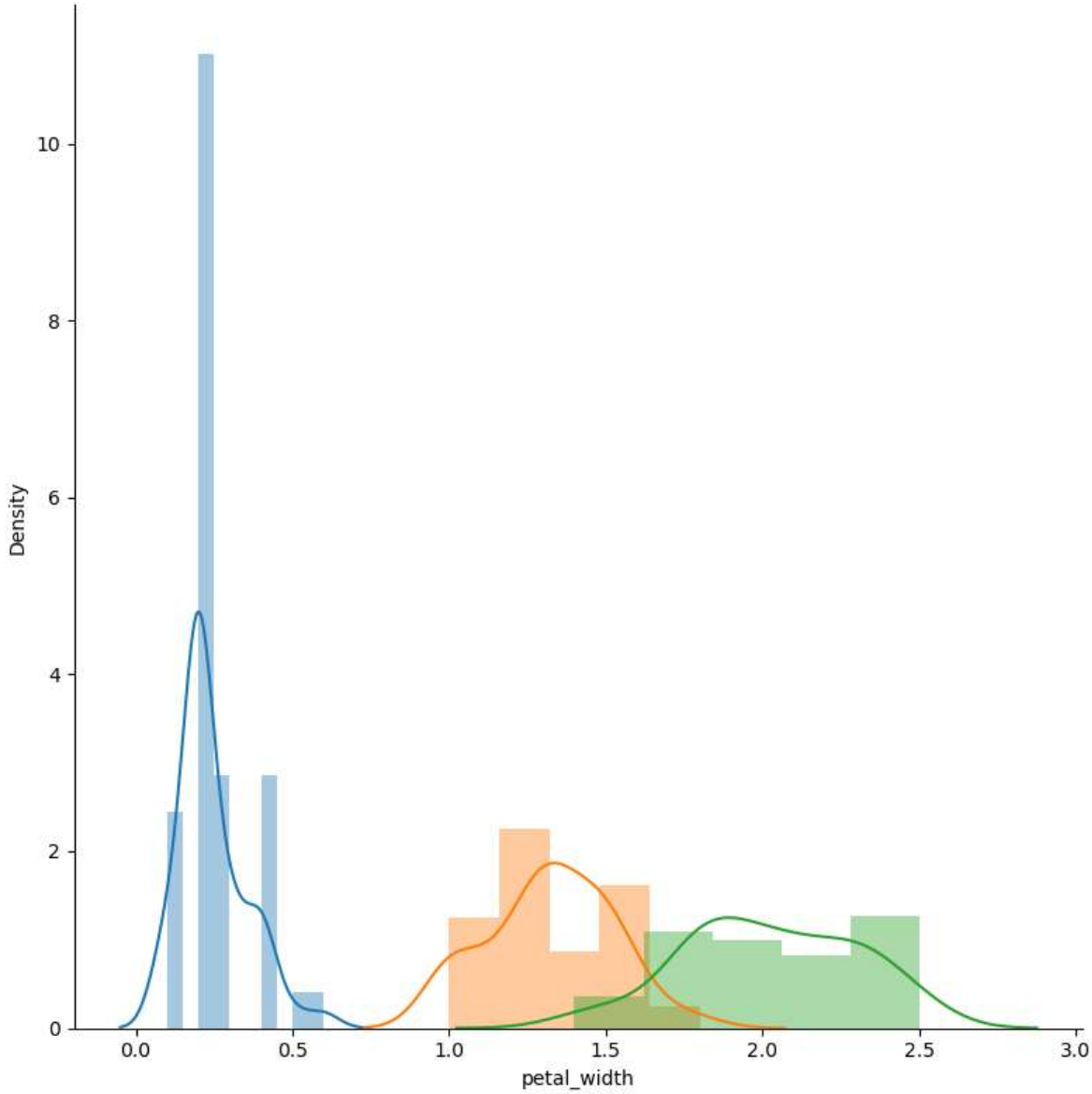
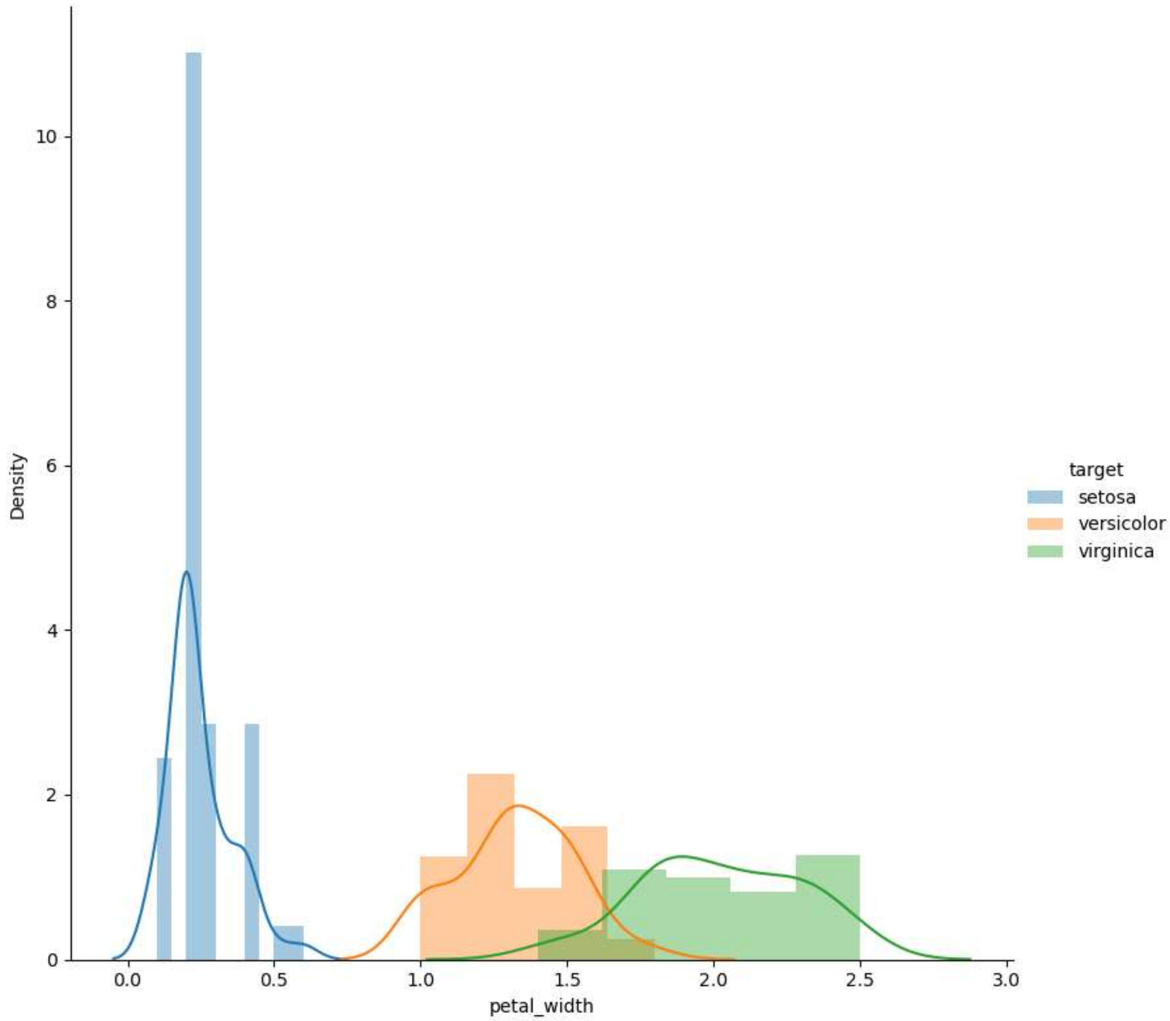

Out[63]:
```
<seaborn.axisgrid.FacetGrid at 0x27a760ef4c0>
```

In [64]:
```
plt.show()
```





In [65]:
```
sns.FacetGrid(df, hue="target", height=8).map(sns.distplot, "petal_length").ad
```

```
C:\Users\Dell\anaconda\lib\site-packages\seaborn\distributions.py:2619: Futur
eWarning: `distplot` is a deprecated function and will be removed in a future
version. Please adapt your code to use either `displot` (a figure-level funct
ion with similar flexibility) or `histplot` (an axes-level function for histo
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  warnings.warn(msg, FutureWarning)
C:\Users\Dell\anaconda\lib\site-packages\seaborn\distributions.py:2619: Futur
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C:\Users\Dell\anaconda\lib\site-packages\seaborn\distributions.py:2619: Futur
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version. Please adapt your code to use either `displot` (a figure-level funct
ion with similar flexibility) or `histplot` (an axes-level function for histo
grams).
  warnings.warn(msg, FutureWarning)
```
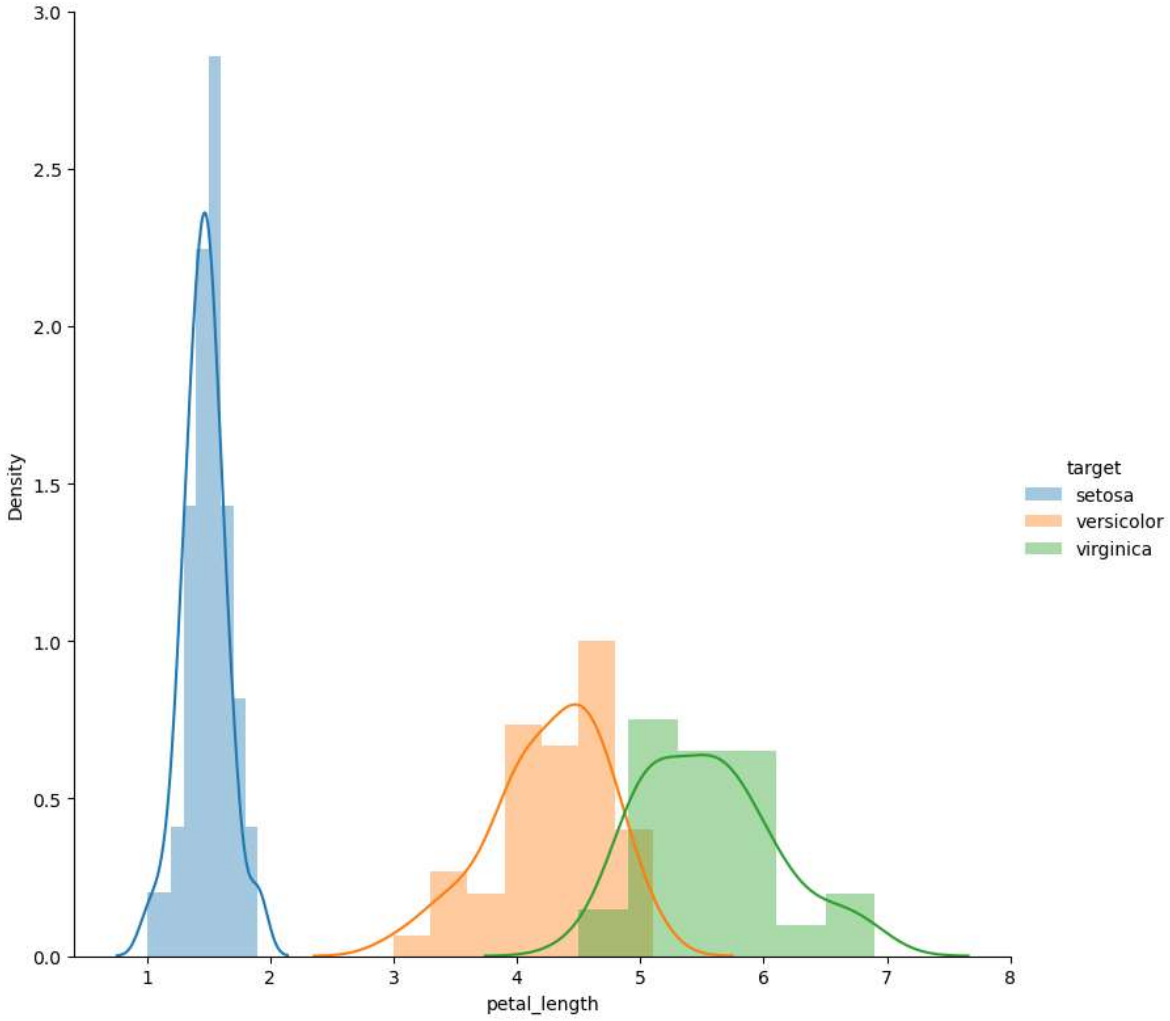

Out[65]: <seaborn.axisgrid.FacetGrid at 0x27a76103eb0>

In [66]:
```
plt.show()
```



In [69]:
```
sns.FacetGrid(df, hue="target", height=8).map(sns.distplot, "sepal_width").add
```

```
C:\Users\Dell\anaconda\lib\site-packages\seaborn\distributions.py:2619: Futur
eWarning: `distplot` is a deprecated function and will be removed in a future
version. Please adapt your code to use either `displot` (a figure-level funct
ion with similar flexibility) or `histplot` (an axes-level function for histo
grams).
  warnings.warn(msg, FutureWarning)
C:\Users\Dell\anaconda\lib\site-packages\seaborn\distributions.py:2619: Futur
eWarning: `distplot` is a deprecated function and will be removed in a future
version. Please adapt your code to use either `displot` (a figure-level funct
ion with similar flexibility) or `histplot` (an axes-level function for histo
grams).
  warnings.warn(msg, FutureWarning)
C:\Users\Dell\anaconda\lib\site-packages\seaborn\distributions.py:2619: Futur
eWarning: `distplot` is a deprecated function and will be removed in a future
version. Please adapt your code to use either `displot` (a figure-level funct
ion with similar flexibility) or `histplot` (an axes-level function for histo
grams).
  warnings.warn(msg, FutureWarning)
```

Out[69]: <seaborn.axisgrid.FacetGrid at 0x27a7690abe0>

In [70]:
```
plt.show()
```

In [71]:
```
sns.FacetGrid(df, hue="target", height=8).map(sns.distplot, "sepal_length").ad
```

```
C:\Users\Dell\anaconda\lib\site-packages\seaborn\distributions.py:2619: Futur
eWarning: `distplot` is a deprecated function and will be removed in a future
version. Please adapt your code to use either `displot` (a figure-level funct
ion with similar flexibility) or `histplot` (an axes-level function for histo
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  warnings.warn(msg, FutureWarning)
C:\Users\Dell\anaconda\lib\site-packages\seaborn\distributions.py:2619: Futur
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grams).
  warnings.warn(msg, FutureWarning)
C:\Users\Dell\anaconda\lib\site-packages\seaborn\distributions.py:2619: Futur
eWarning: `distplot` is a deprecated function and will be removed in a future
version. Please adapt your code to use either `displot` (a figure-level funct
ion with similar flexibility) or `histplot` (an axes-level function for histo
grams).
  warnings.warn(msg, FutureWarning)
```
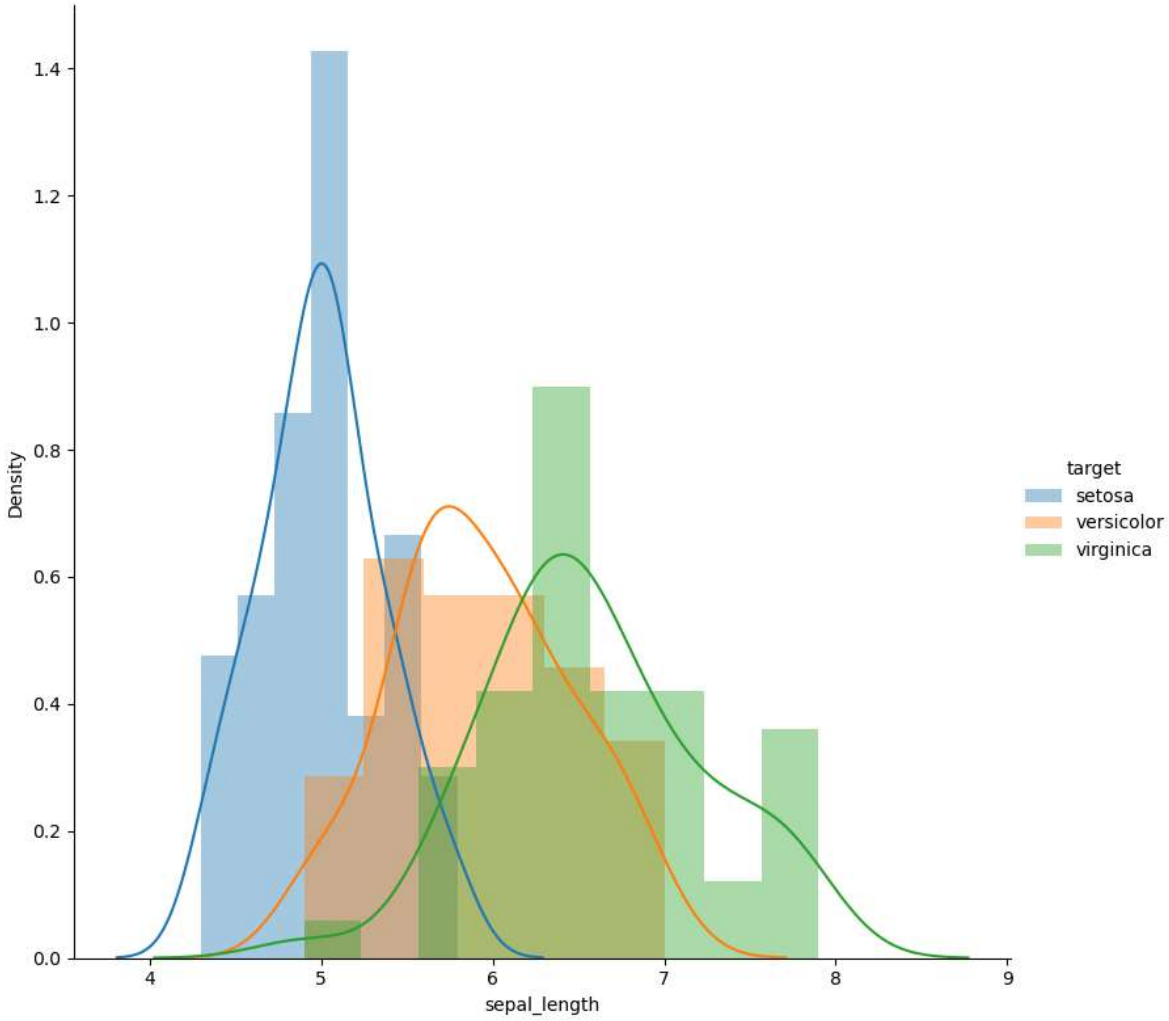

Out[71]:
```
<seaborn.axisgrid.FacetGrid at 0x27a77a50f70>
```

In [72]:
```
plt.show()
```



Box plot

In [73]:
```
sns.boxplot(x="target",y="petal_length",data=df)
plt.show()
```