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

In [2]:
```
from sklearn import datasets
iris_load = datasets.load_iris()
# iris = pd.DataFrame(data=iris_load.data, columns=iris_load.feature_names)

iris = pd.DataFrame(data=iris_load.data, columns=iris_load.feature_names)
iris['Species'] = pd.Categorical.from_codes(iris_load.target, iris_load.targ

iris.head()
```

Out[2]:

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

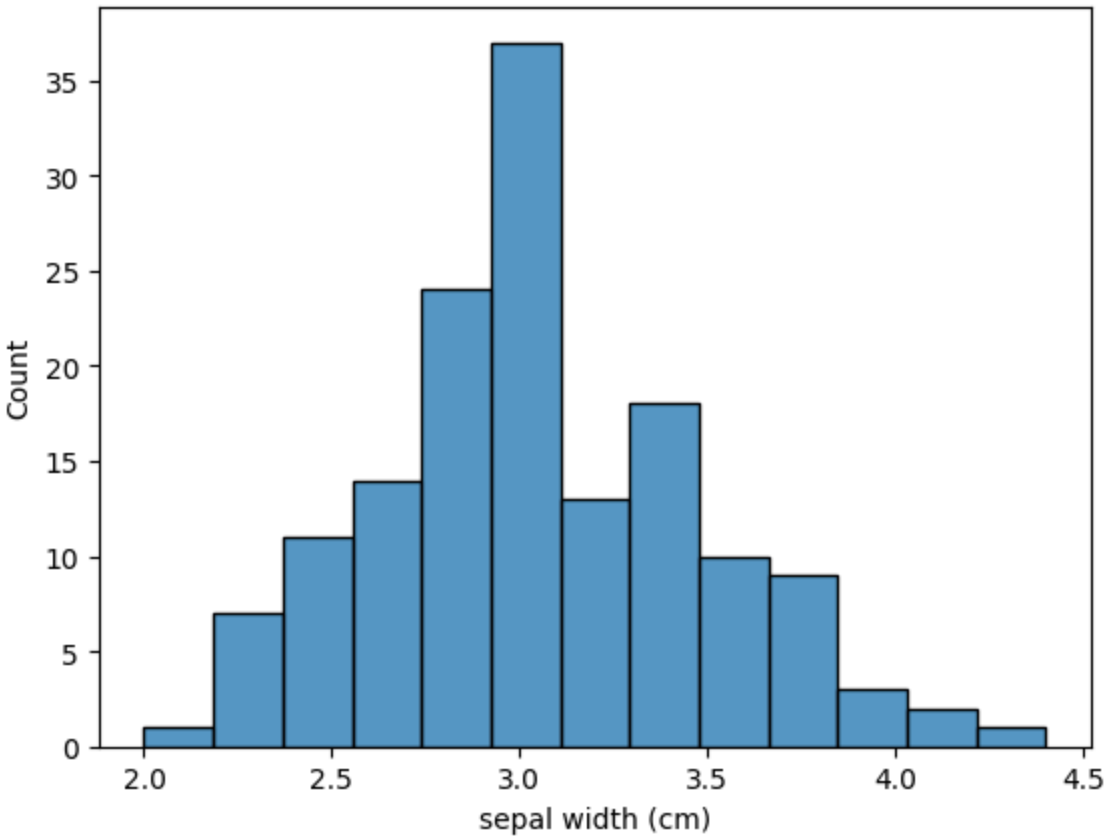
In [3]:
```
data = { "weight": [4.17, 5.58, 5.18, 6.11, 4.50, 4.61, 5.17, 4.53, 5.33,
                    5.14, 4.81, 4.17, 4.41, 3.59, 5.87, 3.83, 6.03, 4.89, 4.
                    6.31, 5.12, 5.54, 5.50, 5.37, 5.29, 4.92, 6.15, 5.80, 5.
                    , "group": ["ctrl"] * 10 + ["trt1"] * 10 + ["trt2"] * 10

PlantGrowth = pd.DataFrame(data)
```

In [4]:
```
PlantGrowth.head()
```

Out[4]:

	weight	group
0	4.17	ctrl
1	5.58	ctrl
2	5.18	ctrl
3	6.11	ctrl
4	4.50	ctrl

In [5]:
```
#1a.
sns.histplot(x='sepal width (cm)', data=iris)
plt.show()
```



1b. I would expect the mean to be slightly higher than the median due to the graph being right skewed.

In [6]:
```
iris.describe()
#1C. We see the mean is 3.06 and the median is 3.0
```

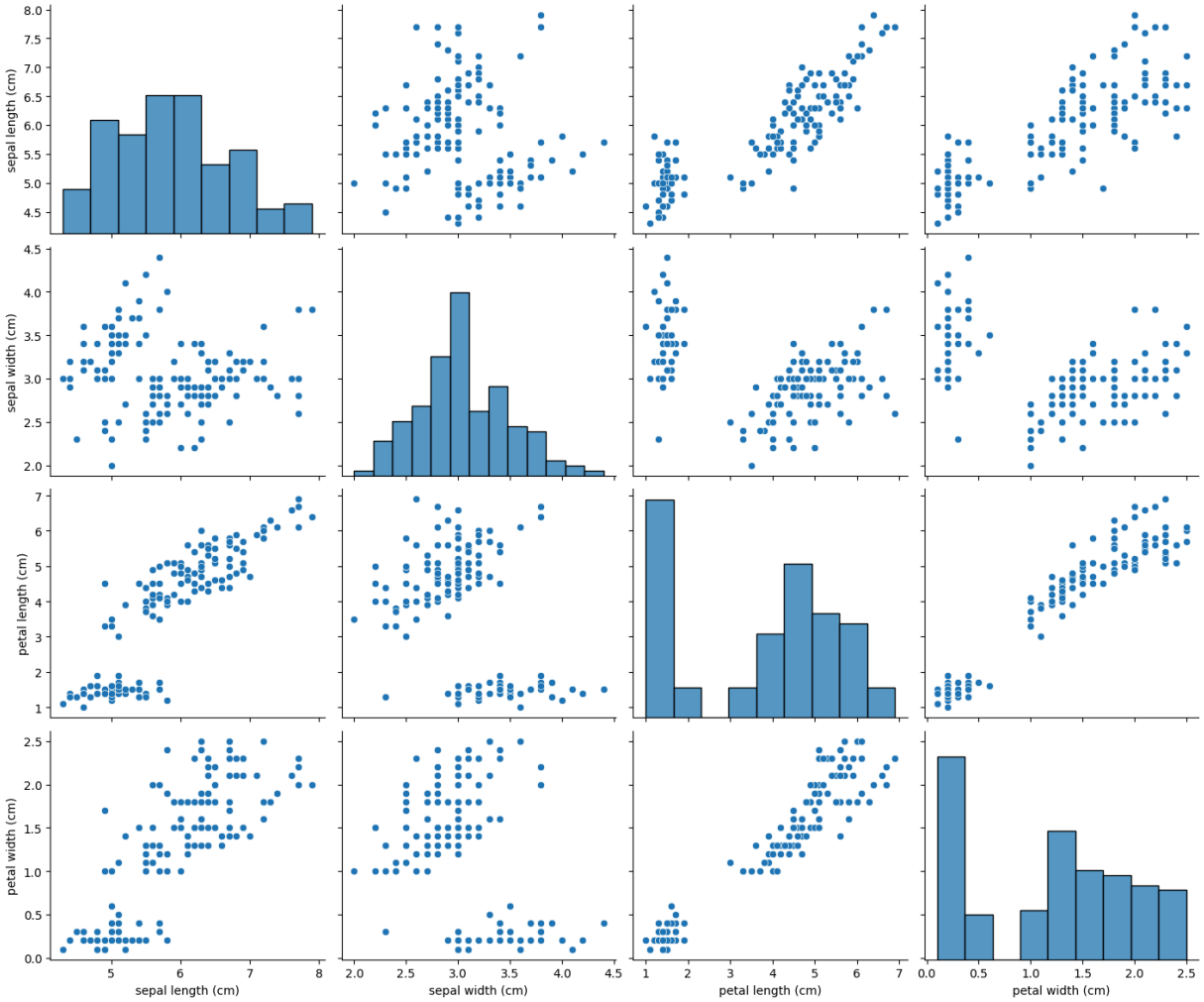
Out[6]:

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

1D. 2.8

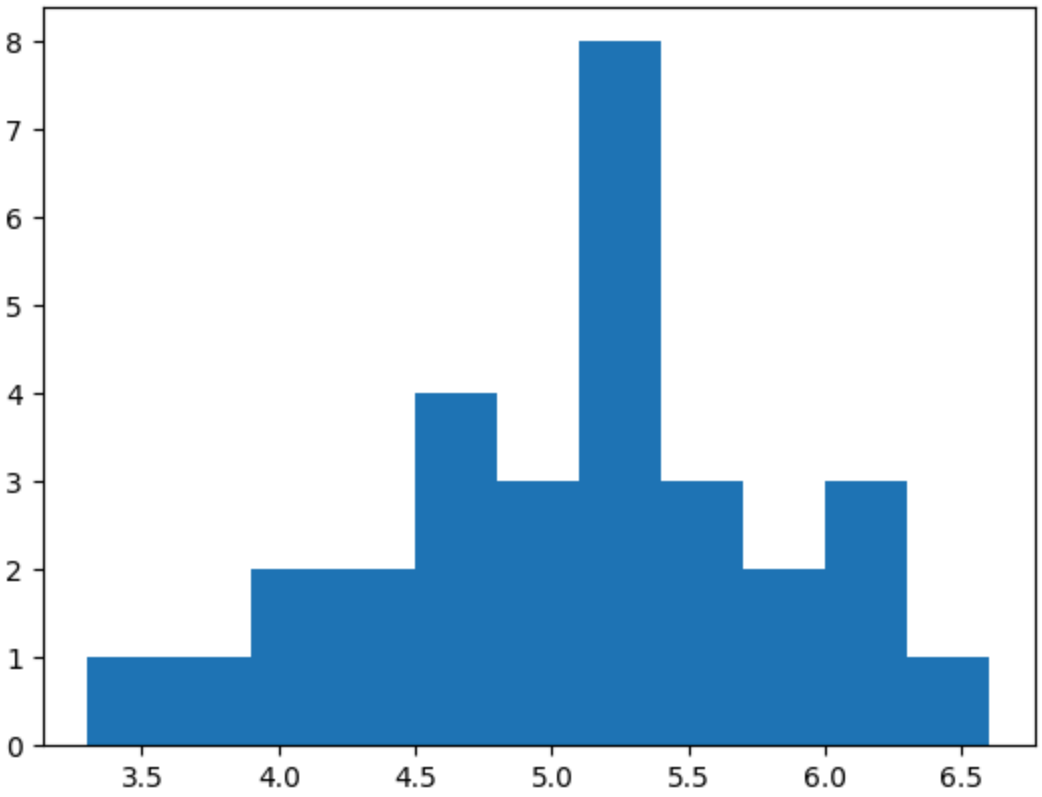
In [7]:
```
#1E
sns.pairplot(iris, height=3, aspect=1.2)
```

Out[7]: <seaborn.axisgrid.PairGrid at 0x7fda10bf4580>

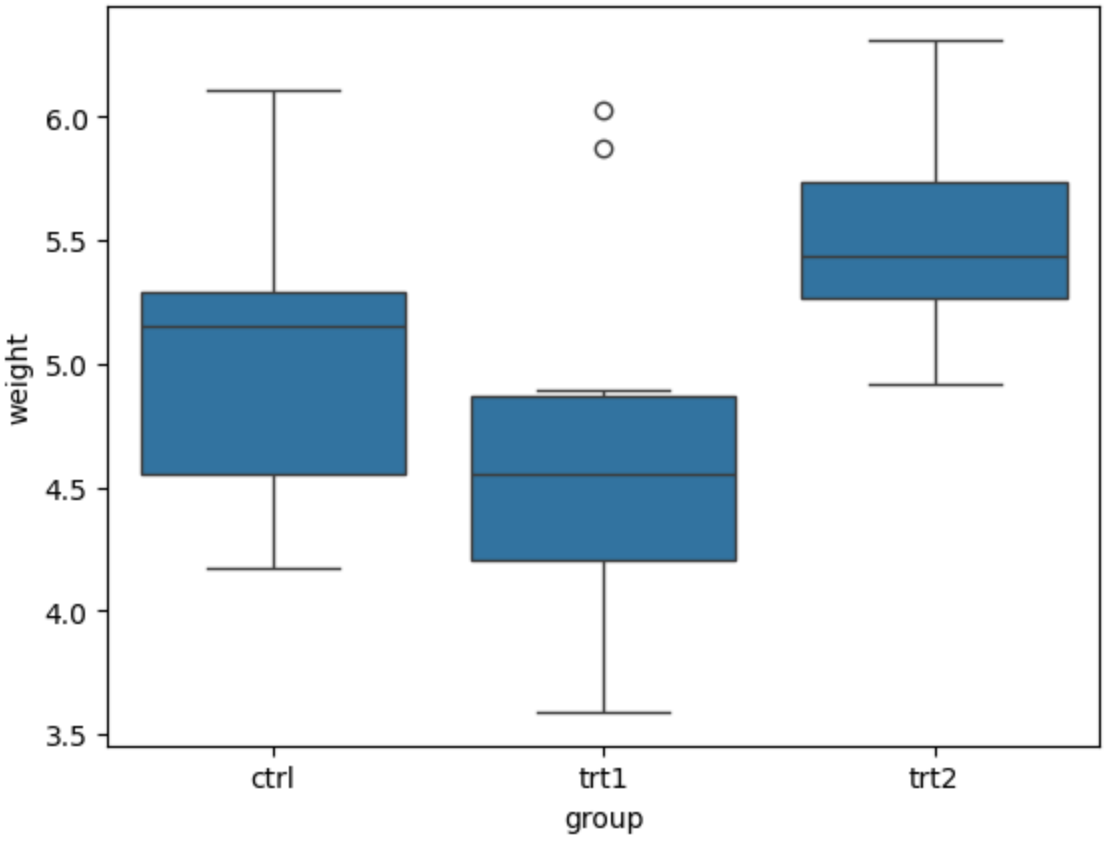


1F. It appears that petal length and petal width have the strongest relationship whereas sepal width and petal length have the weakest.

In [8]:
```
#2A.
bin_edges = [3.3, 3.6, 3.9, 4.2, 4.5, 4.8, 5.1, 5.4, 5.7, 6.0, 6.3, 6.6]
plt.hist(x=PlantGrowth['weight'], bins=bin_edges)
plt.show()
```



In [9]:
```
#2B
sns.boxplot(data=PlantGrowth, x='group', y='weight')
plt.show()
```



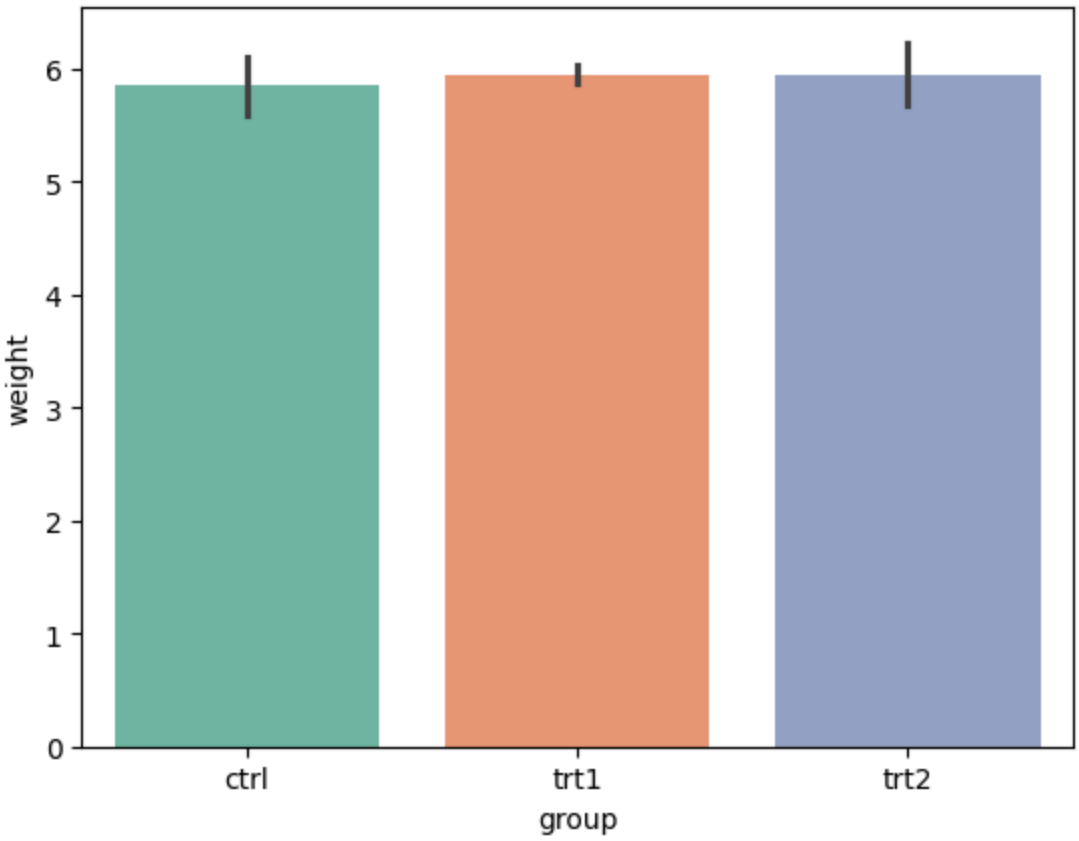
2C. Based on the boxplot, I would say between 95-98% of weights are below trt2

In [10]:
```
#2D
min_trt2 = PlantGrowth[PlantGrowth['group']=='trt2']['weight'].min()
trt1 = PlantGrowth[PlantGrowth['group']=='trt1']['weight']

percent_below = float((trt1 < min_trt2).sum() / len(trt1) * 100)
percent_below
```

Out[10]: 80.0

In [11]:
```
#2E
weight_above = PlantGrowth[PlantGrowth['weight']> 5.5]
sns.barplot(data=weight_above, x='group', y='weight', palette='Set2')
plt.show()
```

```
/var/folders/c8/5t9shnnx55s9qks08wcp_zp40000gn/T/ipykernel_6864/2782251643.py:3: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed in v0.14.0. Assign the `x` variable to `hue` and set `legend=False` for the same effect.

  sns.barplot(data=weight_above, x='group', y='weight', palette='Set2')
```



In [ ]: