In [1]:

```
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sbn
import numpy as np
import warnings
warnings.filterwarnings('ignore')
```

In [2]:

```
df = pd.read_csv('Iris.csv')
df.head()
```

Out[2]:

	Id	SepalLengthCm	SepalWidthCm	PetalLengthCm	PetalWidthCm	Species
0	1	5.1	3.5	1.4	0.2	Iris-setosa
1	2	4.9	3.0	1.4	0.2	Iris-setosa
2	3	4.7	3.2	1.3	0.2	Iris-setosa
3	4	4.6	3.1	1.5	0.2	Iris-setosa
4	5	5.0	3.6	1.4	0.2	Iris-setosa

In [3]:

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 150 entries, 0 to 149
Data columns (total 6 columns):
 #   Column         Non-Null Count  Dtype  
---  ------         --------------  -----  
 0   Id             150 non-null    int64  
 1   SepalLengthCm  150 non-null    float64
 2   SepalWidthCm   150 non-null    float64
 3   PetalLengthCm  150 non-null    float64
 4   PetalWidthCm   150 non-null    float64
 5   Species        150 non-null    object 
dtypes: float64(4), int64(1), object(1)
memory usage: 7.2+ KB
```

In [4]:

```
df.describe()
```

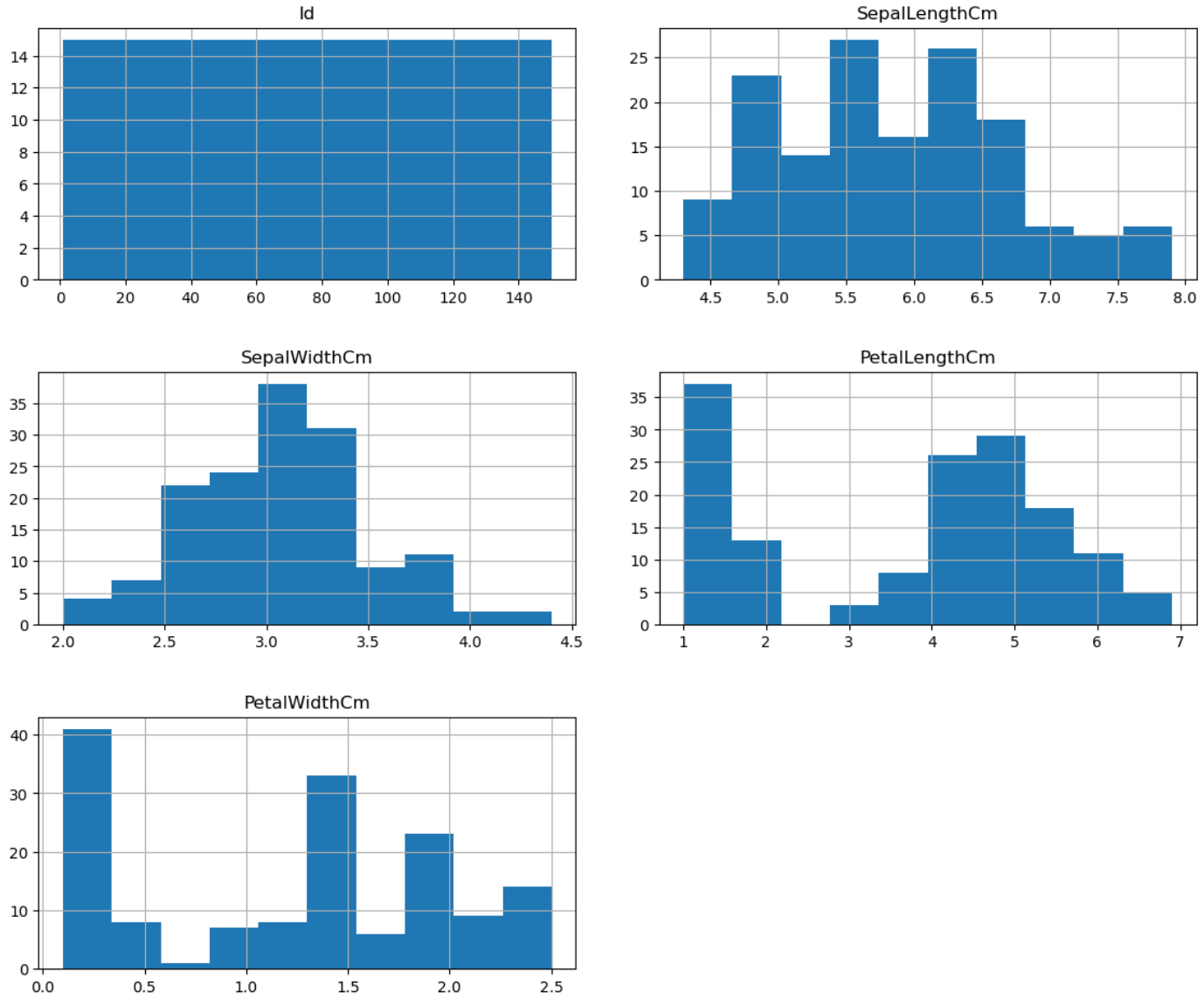
Out[4]:

	Id	SepalLengthCm	SepalWidthCm	PetalLengthCm	PetalWidthCm
count	150.000000	150.000000	150.000000	150.000000	150.000000
mean	75.500000	5.843333	3.054000	3.758667	1.198667
std	43.445368	0.828066	0.433594	1.764420	0.763161
min	1.000000	4.300000	2.000000	1.000000	0.100000
25%	38.250000	5.100000	2.800000	1.600000	0.300000
50%	75.500000	5.800000	3.000000	4.350000	1.300000
75%	112.750000	6.400000	3.300000	5.100000	1.800000

	Id	SepalLengthCm	SepalWidthCm	PetalLengthCm	PetalWidthCm
max	150.000000	7.900000	4.400000	6.900000	2.500000

In [10]:

```
df.hist(figsize=(12, 10), bins=10)  # You can adjust bins as needed
plt.tight_layout(pad=3.0)  # pad controls space between subplots
plt.show()
```



In [6]:

```
sort_data = np.sort(df['SepalLengthCm'])
mean = np.mean(df['SepalLengthCm'])
std = np.std(df['SepalLengthCm'])
outliers=[]
for x in sort_data:
    z = (x - mean)/std
    if z >2:
        outliers.append(x)

print(outliers)
```

```
[7.6, 7.7, 7.7, 7.7, 7.7, 7.9]
```

In [7]:

```
sort_data2 = np.sort(df['SepalWidthCm'])
Q1 = np.percentile(sort_data2, 25, interpolation='midpoint')
Q3 = np.percentile(sort_data2, 75, interpolation='midpoint')
IQR = Q3 - Q1
print("Q1 : ",Q1, "\n", "Q3: ",Q3)
print("inter quartile range : ", IQR)
low_limit = Q1-1.5*IQR
up_limit = Q3+1.5*IQR
print('low_limit is', low_limit)
print('up_limit is', up_limit)

outliers = []
for x in sort_data2:
    if ((x < low_limit) or (x > up_limit)):
        outliers.append(x)

print(outliers)
```

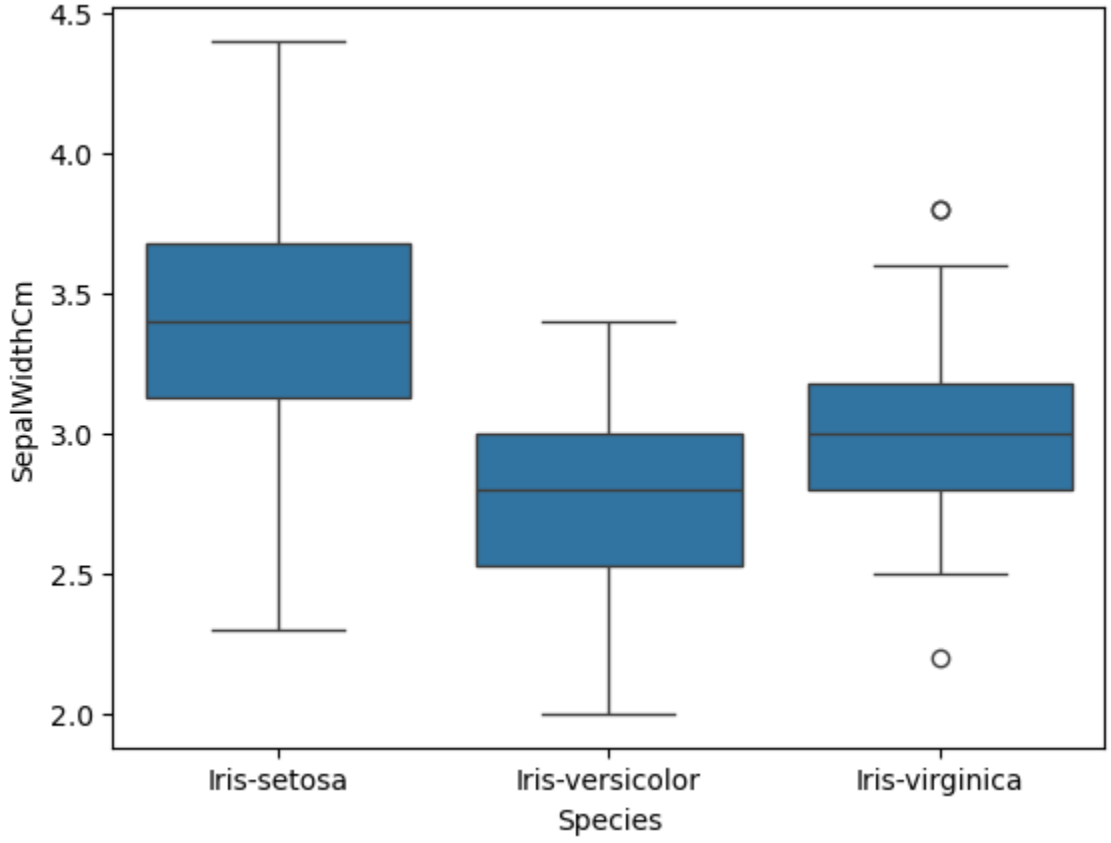
```
Q1 :  2.8
 Q3:  3.3
inter quartile range :  0.5
low_limit is 2.05
up_limit is 4.05
[2.0, 4.1, 4.2, 4.4]
```

In [8]:

```
sbn.boxplot(data=df, x='Species', y='SepalWidthCm')
```

Out[8]:

```
<Axes: xlabel='Species', ylabel='SepalWidthCm'>
```



In [9]:

```
sbn.scatterplot(data=df, x='SepalWidthCm', y='SepalLengthCm', hue='Species')
```

Out[9]:

```
<Axes: xlabel='SepalWidthCm', ylabel='SepalLengthCm'>
```