In [1]:
```
# Import necessary libraries
import pandas as pd
from sklearn.model_selection import train_test_split
from sklearn.tree import DecisionTreeClassifier
from sklearn.metrics import accuracy_score, precision_score, recall_score
import matplotlib.pyplot as plt
import seaborn as sns
from sklearn.datasets import load_iris
```

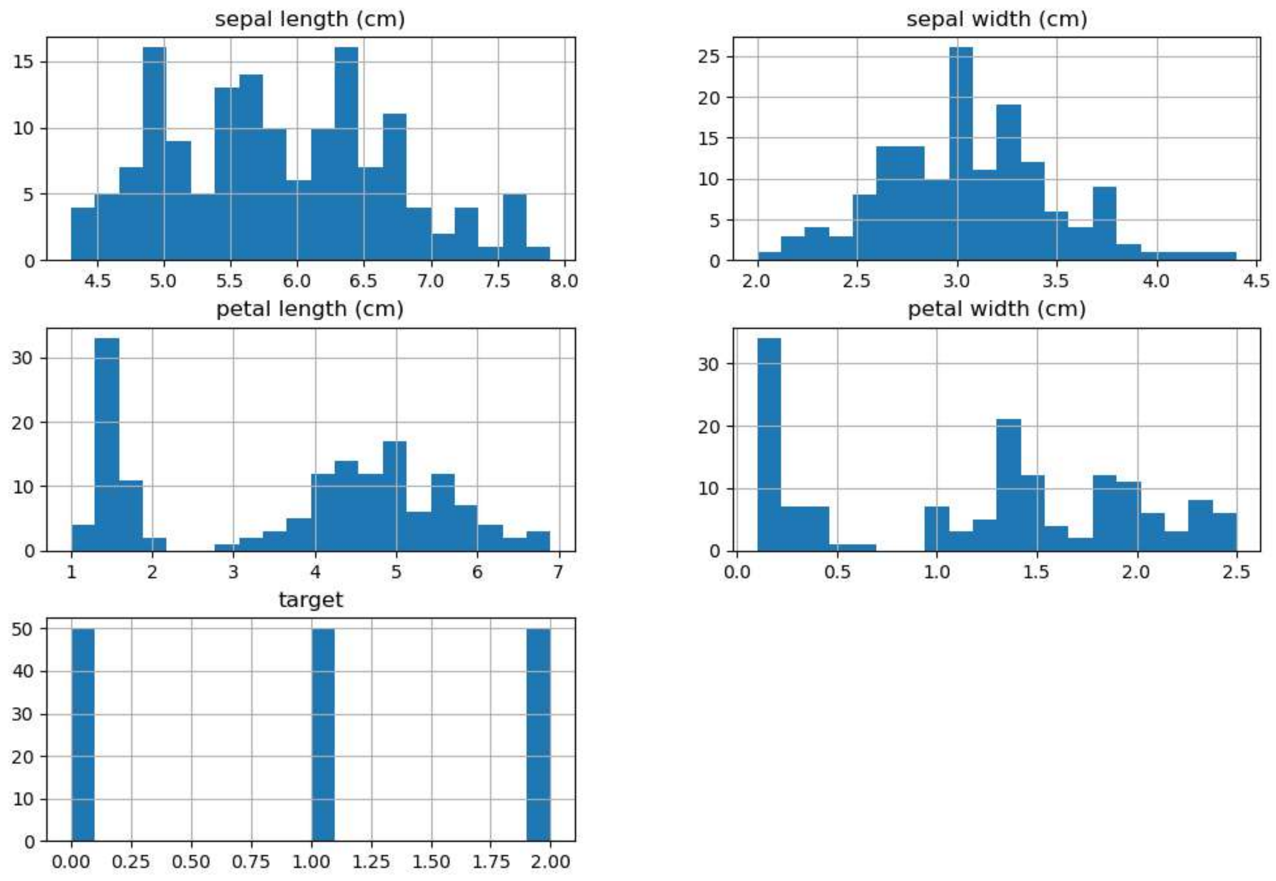
In [2]:
```
# Load the Iris dataset
iris = load_iris()
iris_df = pd.DataFrame(data=iris.data, columns=iris.feature_names)
iris_df['target'] = iris.target
```

In [3]:
```
# EDA
# Explore the distribution of each feature
iris_df.describe()
```

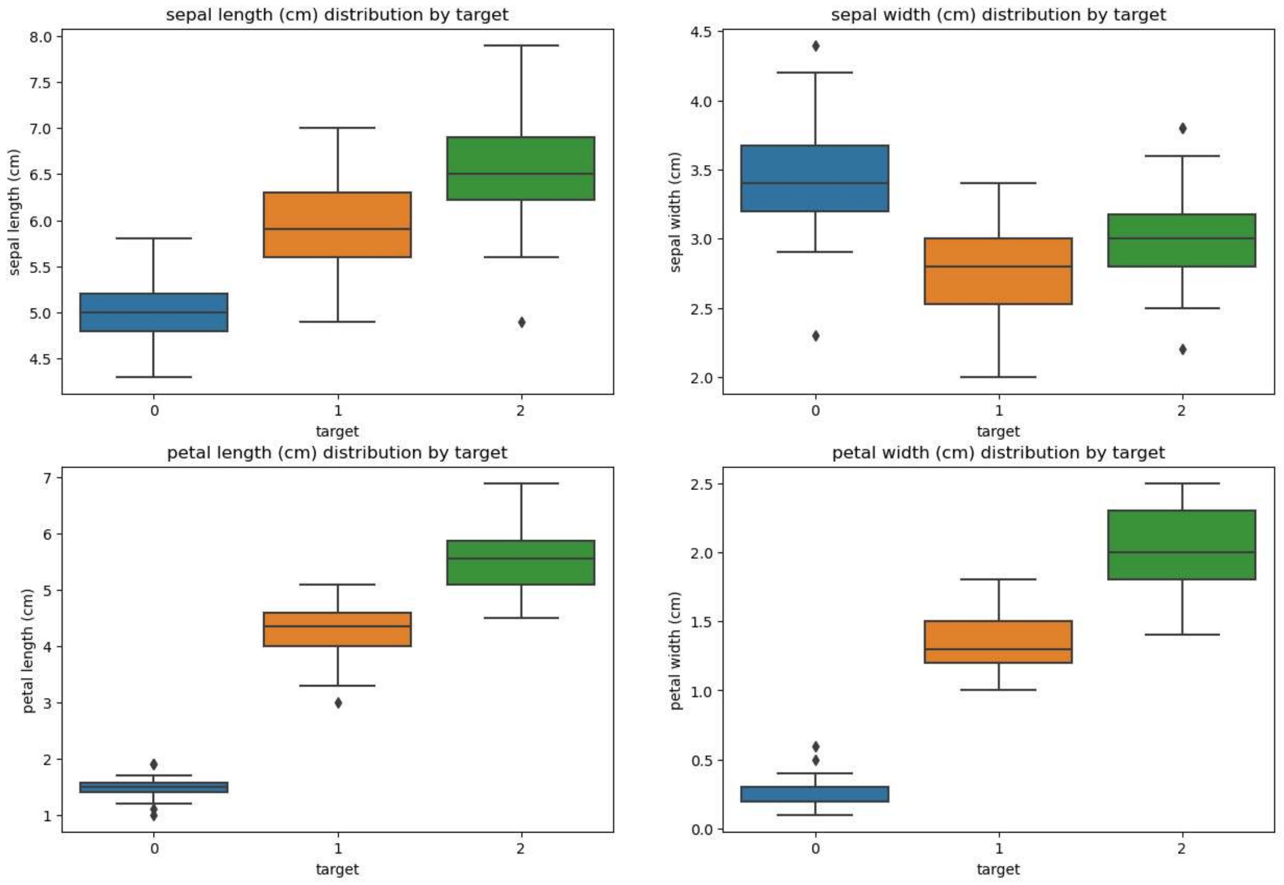
Out[3]:

| | 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 [5]:
```
# Visualizations
# Histograms
iris_df.hist(bins=20, figsize=(12, 8))
plt.show()
```

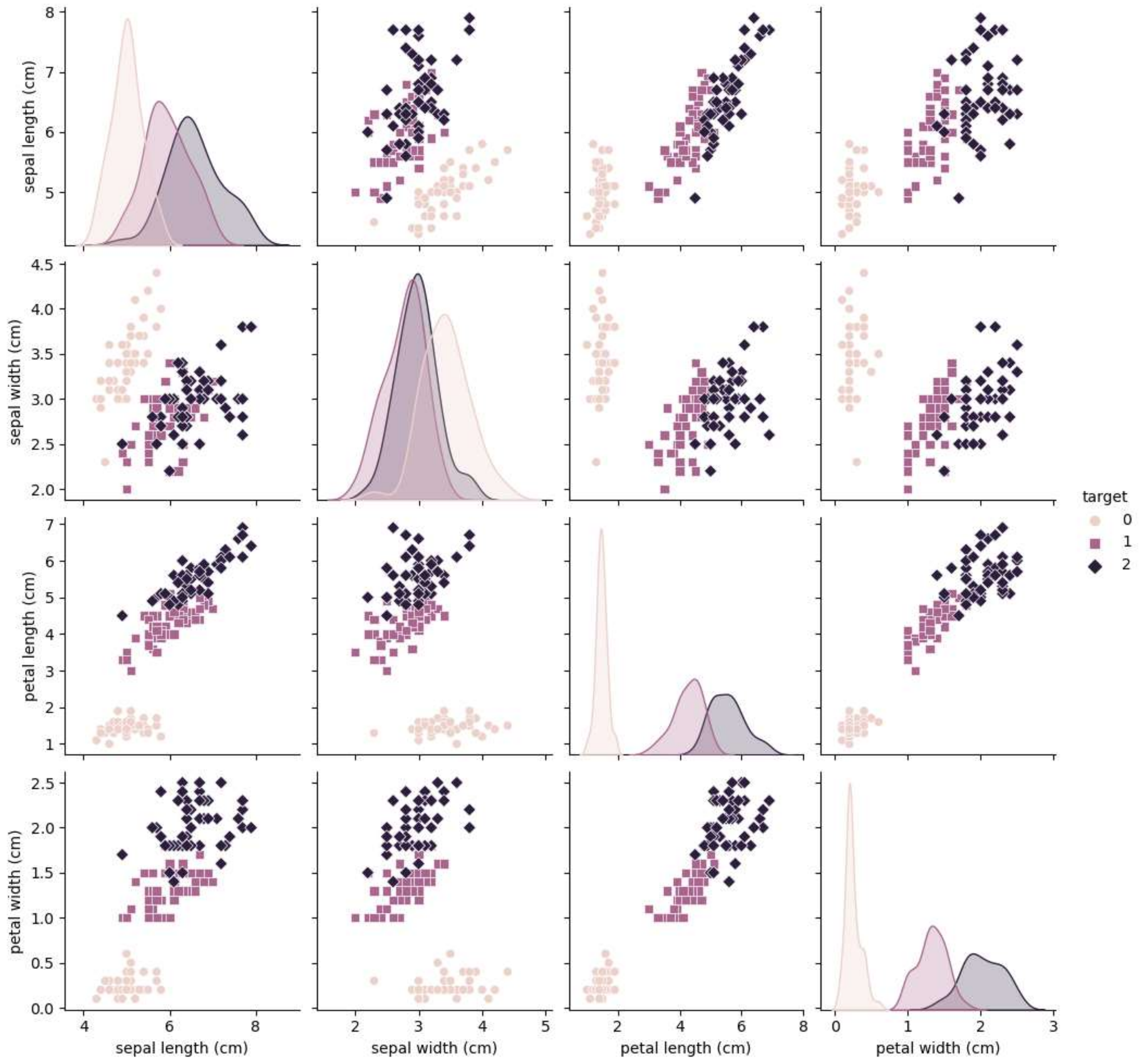


In [6]:
```python
# Box plots
plt.figure(figsize=(15, 10))
for i, feature in enumerate(iris.feature_names):
    plt.subplot(2, 2, i + 1)
    sns.boxplot(x='target', y=feature, data=iris_df)
    plt.title(f'{feature} distribution by target')
plt.show()
```



In [8]:
```
# Scatter plots
sns.pairplot(iris_df, hue='target', markers=["o", "s", "D"])
plt.show()
```

```
C:\Users\Admin\anaconda3\Lib\site-packages\seaborn\axisgrid.py:118: UserWarning: The figure layout has ch
anged to tight
  self._figure.tight_layout(*args, **kwargs)
```



In [9]:
```
# Split the dataset into training and testing sets
X_train, X_test, y_train, y_test = train_test_split(iris.data, iris.target, test_size=0.2, random_state=42
```

In [10]:
```
# Train the Decision Tree model
model = DecisionTreeClassifier(random_state=42)
model.fit(X_train, y_train)
```

Out[10]:
```
▾ DecisionTreeClassifier
DecisionTreeClassifier(random_state=42)
```

In [11]:
```
# Make predictions on the testing set
y_pred = model.predict(X_test)
```

In [12]:
```
# Evaluate the model
accuracy = accuracy_score(y_test, y_pred)
precision = precision_score(y_test, y_pred, average='weighted')
recall = recall_score(y_test, y_pred, average='weighted')

print(f"Accuracy: {accuracy:.2f}")
print(f"Precision: {precision:.2f}")
print(f"Recall: {recall:.2f}")
```

```
Accuracy: 1.00
Precision: 1.00
Recall: 1.00
```