In [1]:
```
import pandas as pd
import numpy as np
from sklearn.tree import DecisionTreeClassifier
from sklearn.model_selection import train_test_split
from sklearn import metrics
from matplotlib import pyplot as plt
from sklearn import tree
```

In [5]:
```
df = pd.read_csv('Iris.csv')
df.head(6)
```

Out[5]:

	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
5	6	5.4	3.9	1.7	0.4	Iris-setosa

In [4]:
```
df.tail(10)
```

Out[4]:

	Id	SepalLengthCm	SepalWidthCm	PetalLengthCm	PetalWidthCm	Species
140	141	6.7	3.1	5.6	2.4	Iris-virginica
141	142	6.9	3.1	5.1	2.3	Iris-virginica
142	143	5.8	2.7	5.1	1.9	Iris-virginica
143	144	6.8	3.2	5.9	2.3	Iris-virginica
144	145	6.7	3.3	5.7	2.5	Iris-virginica
145	146	6.7	3.0	5.2	2.3	Iris-virginica
146	147	6.3	2.5	5.0	1.9	Iris-virginica
147	148	6.5	3.0	5.2	2.0	Iris-virginica
148	149	6.2	3.4	5.4	2.3	Iris-virginica
149	150	5.9	3.0	5.1	1.8	Iris-virginica

In [6]:
```
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 [7]:
```
feature_cols = df.iloc[:,[1,2,3,4]]
X = feature_cols.values
print(X)
y=df.Species
print("The target classes\n", y)
```

```
[[5.1 3.5 1.4 0.2]
 [4.9 3.  1.4 0.2]
 [4.7 3.2 1.3 0.2]
 [4.6 3.1 1.5 0.2]
 [5.  3.6 1.4 0.2]
 [5.4 3.9 1.7 0.4]
 [4.6 3.4 1.4 0.3]
 [5.  3.4 1.5 0.2]
 [4.4 2.9 1.4 0.2]
 [4.9 3.1 1.5 0.1]
 [5.4 3.7 1.5 0.2]
 [4.8 3.4 1.6 0.2]
 [4.8 3.  1.4 0.1]
 [4.3 3.  1.1 0.1]
 [5.8 4.  1.2 0.2]
 [5.7 4.4 1.5 0.4]
 [5.4 3.9 1.3 0.4]
 [5.1 3.5 1.4 0.3]
 [5.7 3.8 1.7 0.3]
```

In [8]:
```
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.3, ra
print(X_train.shape)
print(X_test.shape)
print(y_train.shape)
print(y_test.shape)
```

```
(105, 4)
(45, 4)
(105,)
(45,)
```

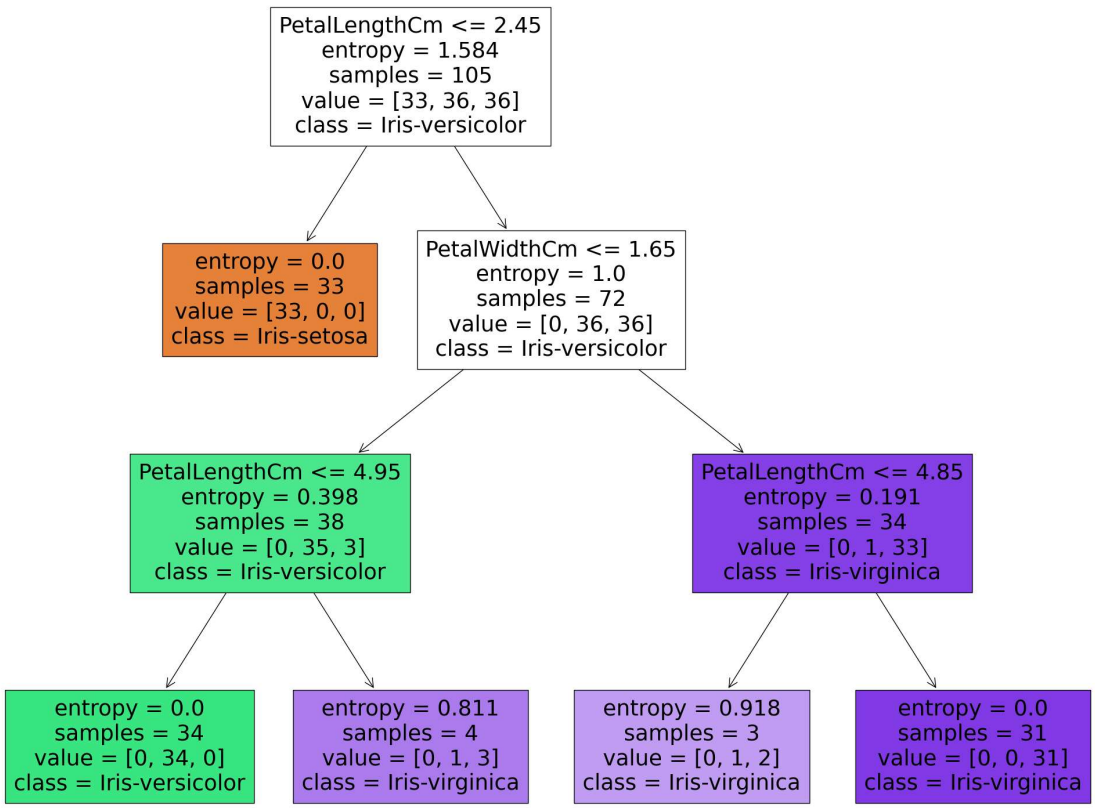
In [11]:
```
clf = DecisionTreeClassifier(criterion='entropy', splitter='best', max_dep
clf = clf.fit(X_train,y_train)
y_pred= clf.predict(X_test)
print(y_pred)
```

```
['Iris-setosa' 'Iris-setosa' 'Iris-setosa' 'Iris-setosa' 'Iris-setosa'
 'Iris-virginica' 'Iris-versicolor' 'Iris-setosa' 'Iris-virginica'
 'Iris-versicolor' 'Iris-versicolor' 'Iris-setosa' 'Iris-versicolor'
 'Iris-versicolor' 'Iris-virginica' 'Iris-setosa' 'Iris-versicolor'
 'Iris-virginica' 'Iris-virginica' 'Iris-setosa' 'Iris-virginica'
 'Iris-virginica' 'Iris-virginica' 'Iris-versicolor' 'Iris-setosa'
 'Iris-virginica' 'Iris-virginica' 'Iris-versicolor' 'Iris-versicolor'
 'Iris-versicolor' 'Iris-setosa' 'Iris-setosa' 'Iris-virginica'
 'Iris-versicolor' 'Iris-setosa' 'Iris-setosa' 'Iris-virginica'
 'Iris-setosa' 'Iris-virginica' 'Iris-versicolor' 'Iris-virginica'
 'Iris-versicolor' 'Iris-setosa' 'Iris-setosa' 'Iris-virginica']
```

In [12]:
```
print("\n Accuracy:",metrics.accuracy_score(y_test, y_pred))
```

```
 Accuracy: 0.9777777777777777
```

In [13]:
```
fig = plt.figure(figsize=(25,20))
_ = tree.plot_tree(clf,
                   feature_names=['SepalLengthCm', 'SepalWidthCm', 'PetalLe
                   class_names=['Iris-setosa', 'Iris-versicolor', 'Iris-vi
                   filled=True)
```



In [ ]: