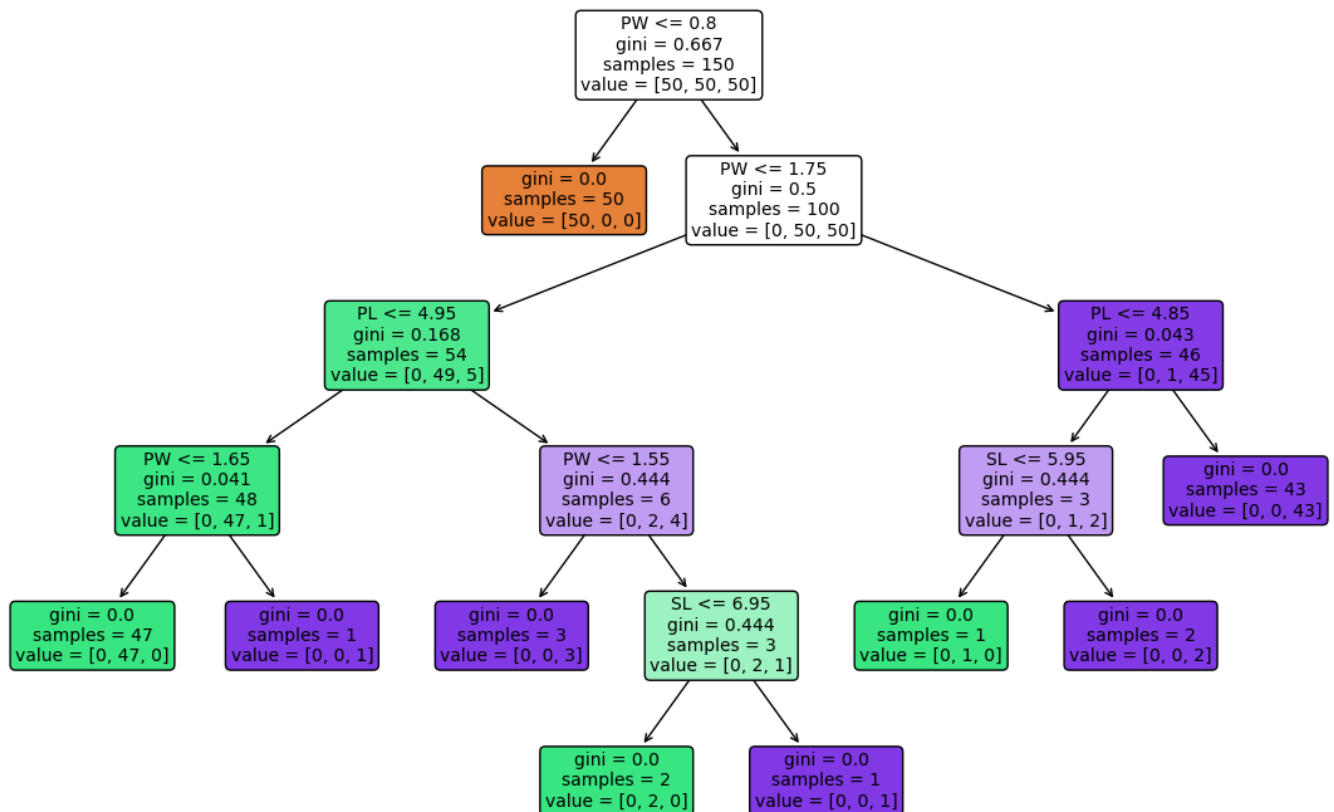


```
In [1]: from sklearn.datasets import load_iris
from sklearn.tree import DecisionTreeClassifier, plot_tree
import matplotlib.pyplot as plt
```

```
In [18]: iris=load_iris()
X=iris.data
y=iris.target

model=DecisionTreeClassifier(random_state=10,criterion='gini',max_depth=None,max_leaf_no
model.fit(X,y)
plt.figure(figsize=(14,9))
plot_tree(model,fontsize=10,feature_names=['SL','SW','PL','PW'],rounded=True,filled=True
plt.show()
```



```
In [39]: print(model.predict([[1.2, .9, 5.2, .85]]))

[2]
```

```
In [40]: model.feature_importances_
```

```
Out[40]: array([0.02666667, 0.          , 0.05072262, 0.92261071])
```

```
In [41]: X
```

```
Out[41]: array([[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],
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[5.4, 3.4, 1.7, 0.2],
[5.1, 3.7, 1.5, 0.4],
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[4.8, 3.4, 1.9, 0.2],
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[5.2, 3.4, 1.4, 0.2],
[4.7, 3.2, 1.6, 0.2],
[4.8, 3.1, 1.6, 0.2],
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[5.5, 4.2, 1.4, 0.2],
[4.9, 3.1, 1.5, 0.2],
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[5.5, 3.5, 1.3, 0.2],
[4.9, 3.6, 1.4, 0.1],
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[4.4, 3.2, 1.3, 0.2],
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[5.1, 3.8, 1.9, 0.4],
[4.8, 3. , 1.4, 0.3],
[5.1, 3.8, 1.6, 0.2],
[4.6, 3.2, 1.4, 0.2],
[5.3, 3.7, 1.5, 0.2],
[5. , 3.3, 1.4, 0.2],
[7. , 3.2, 4.7, 1.4],
[6.4, 3.2, 4.5, 1.5],
[6.9, 3.1, 4.9, 1.5],
[5.5, 2.3, 4. , 1.3],
[6.5, 2.8, 4.6, 1.5],
[5.7, 2.8, 4.5, 1.3],
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[6. , 2.2, 4. , 1.],
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[5.6, 2.9, 3.6, 1.3],
[6.7, 3.1, 4.4, 1.4],
[5.6, 3. , 4.5, 1.5],
[5.8, 2.7, 4.1, 1.],
[6.2, 2.2, 4.5, 1.5],
[5.6, 2.5, 3.9, 1.1],
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[6.1, 2.8, 4. , 1.3],
[6.3, 2.5, 4.9, 1.5],
[6.1, 2.8, 4.7, 1.2],
[6.4, 2.9, 4.3, 1.3],
[6.6, 3. , 4.4, 1.4],

[6.8, 2.8, 4.8, 1.4],
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[6. , 2.9, 4.5, 1.5],
[5.7, 2.6, 3.5, 1.],
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[5.5, 2.4, 3.7, 1.],
[5.8, 2.7, 3.9, 1.2],
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[5.4, 3. , 4.5, 1.5],
[6. , 3.4, 4.5, 1.6],
[6.7, 3.1, 4.7, 1.5],
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[5.5, 2.5, 4. , 1.3],
[5.5, 2.6, 4.4, 1.2],
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[5.6, 2.7, 4.2, 1.3],
[5.7, 3. , 4.2, 1.2],
[5.7, 2.9, 4.2, 1.3],
[6.2, 2.9, 4.3, 1.3],
[5.1, 2.5, 3. , 1.1],
[5.7, 2.8, 4.1, 1.3],
[6.3, 3.3, 6. , 2.5],
[5.8, 2.7, 5.1, 1.9],
[7.1, 3. , 5.9, 2.1],
[6.3, 2.9, 5.6, 1.8],
[6.5, 3. , 5.8, 2.2],
[7.6, 3. , 6.6, 2.1],
[4.9, 2.5, 4.5, 1.7],
[7.3, 2.9, 6.3, 1.8],
[6.7, 2.5, 5.8, 1.8],
[7.2, 3.6, 6.1, 2.5],
[6.5, 3.2, 5.1, 2.],
[6.4, 2.7, 5.3, 1.9],
[6.8, 3. , 5.5, 2.1],
[5.7, 2.5, 5. , 2.],
[5.8, 2.8, 5.1, 2.4],
[6.4, 3.2, 5.3, 2.3],
[6.5, 3. , 5.5, 1.8],
[7.7, 3.8, 6.7, 2.2],
[7.7, 2.6, 6.9, 2.3],
[6. , 2.2, 5. , 1.5],
[6.9, 3.2, 5.7, 2.3],
[5.6, 2.8, 4.9, 2.],
[7.7, 2.8, 6.7, 2.],
[6.3, 2.7, 4.9, 1.8],
[6.7, 3.3, 5.7, 2.1],
[7.2, 3.2, 6. , 1.8],
[6.2, 2.8, 4.8, 1.8],
[6.1, 3. , 4.9, 1.8],
[6.4, 2.8, 5.6, 2.1],
[7.2, 3. , 5.8, 1.6],
[7.4, 2.8, 6.1, 1.9],
[7.9, 3.8, 6.4, 2.],
[6.4, 2.8, 5.6, 2.2],
[6.3, 2.8, 5.1, 1.5],
[6.1, 2.6, 5.6, 1.4],
[7.7, 3. , 6.1, 2.3],
[6.3, 3.4, 5.6, 2.4],
[6.4, 3.1, 5.5, 1.8],
[6. , 3. , 4.8, 1.8],
[6.9, 3.1, 5.4, 2.1],
[6.7, 3.1, 5.6, 2.4],
[6.9, 3.1, 5.1, 2.3],

```
[5.8, 2.7, 5.1, 1.9],
[6.8, 3.2, 5.9, 2.3],
[6.7, 3.3, 5.7, 2.5],
[6.7, 3. , 5.2, 2.3],
[6.3, 2.5, 5. , 1.9],
[6.5, 3. , 5.2, 2. ],
[6.2, 3.4, 5.4, 2.3],
[5.9, 3. , 5.1, 1.8]])
```

```
In [19]: import pandas as pd
```

```
In [20]: df=pd.read_csv("f:/dataset/classification/data_tree.txt")
df
```

```
Out[20]:
```

	color	dim	label
0	green	3	apple
1	yellow	3	lemon
2	yellow	3	apple
3	red	1	grape
4	green	1	grape
5	yellow	2	lemon

```
In [21]: df.color=df.color.map({'green':0,'red':1,'yellow':2})
```

```
In [22]: df
```

```
Out[22]:
```

	color	dim	label
0	0	3	apple
1	2	3	lemon
2	2	3	apple
3	1	1	grape
4	0	1	grape
5	2	2	lemon

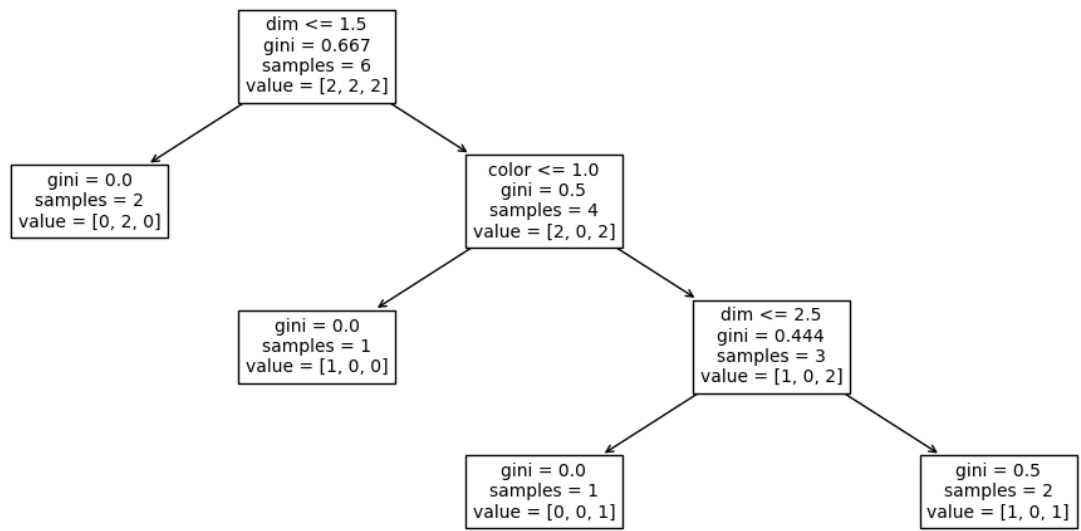
```
In [23]: X=df.iloc[:, :-1].values
y=df.iloc[:, -1].values
```

```
In [24]: model=DecisionTreeClassifier()
model.fit(X,y)
```

```
Out[24]:
```

▼ DecisionTreeClassifier
 DecisionTreeClassifier()

```
In [32]: plt.figure(figsize=(14,6))
plot_tree(model,feature_names=['color','dim'],fontsize=10)
plt.show()
```



In [33]: 2/3

Out[33]: 0.6666666666666666

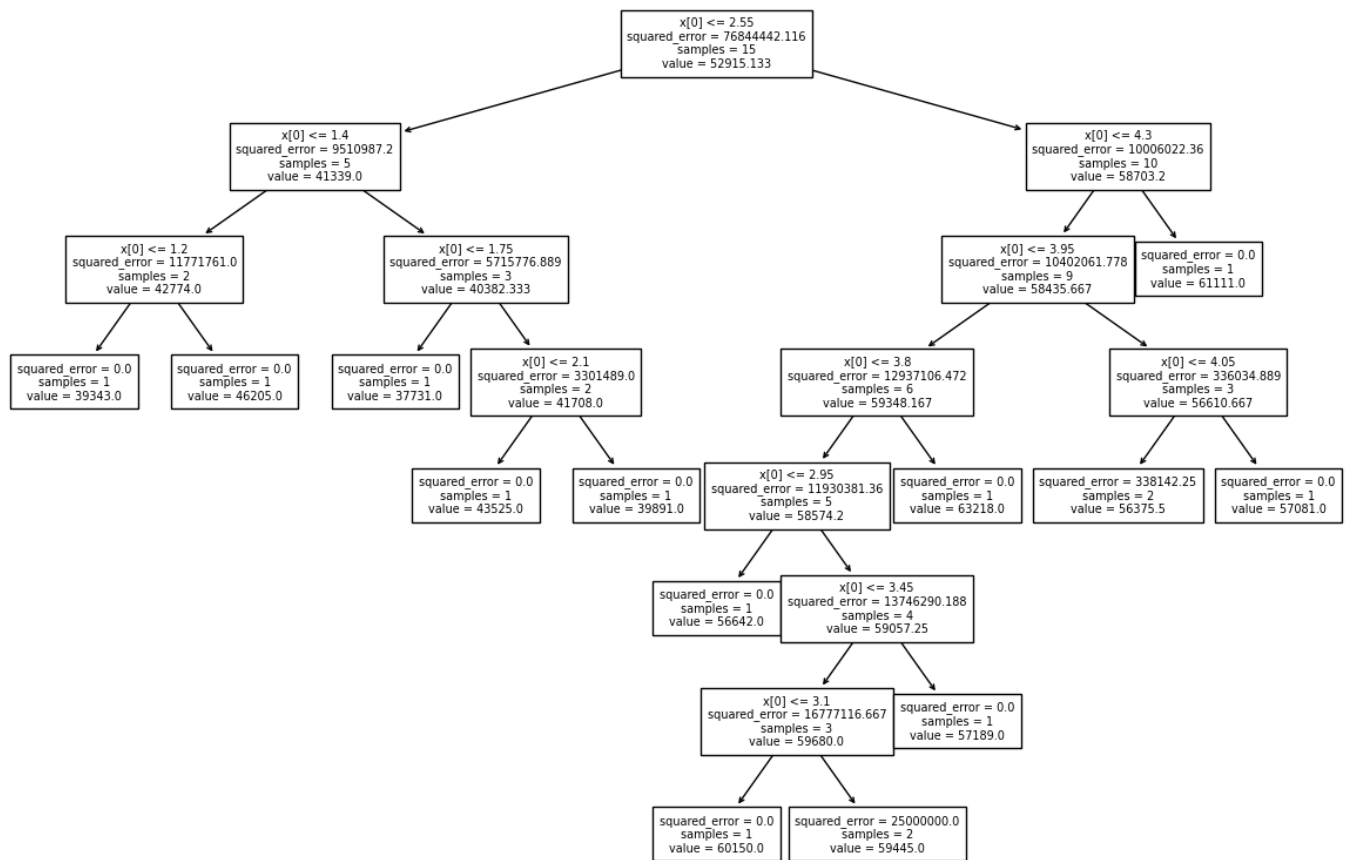
```
In [48]: df=pd.read_csv("f:/dataset/regression/salary_1_variable.csv")
X=df.iloc[:15,:-1].values
y=df.iloc[:15,-1].values
```

```
In [49]: from sklearn.tree import DecisionTreeRegressor
```

```
In [50]: model=DecisionTreeRegressor(criterion='squared_error')
model.fit(X,y)
```

Out[50]: ▼ DecisionTreeRegressor
DecisionTreeRegressor()

```
In [51]: plt.figure(figsize=(15,10))
plot_tree(model,fontsize=7)
plt.show()
```



In [55]: `model.predict([[45]])`

Out[55]: `array([61111.])`

In []: