# Week 4 Practical Lab: Decision tree classifier using KNIME

**Useful resources:**

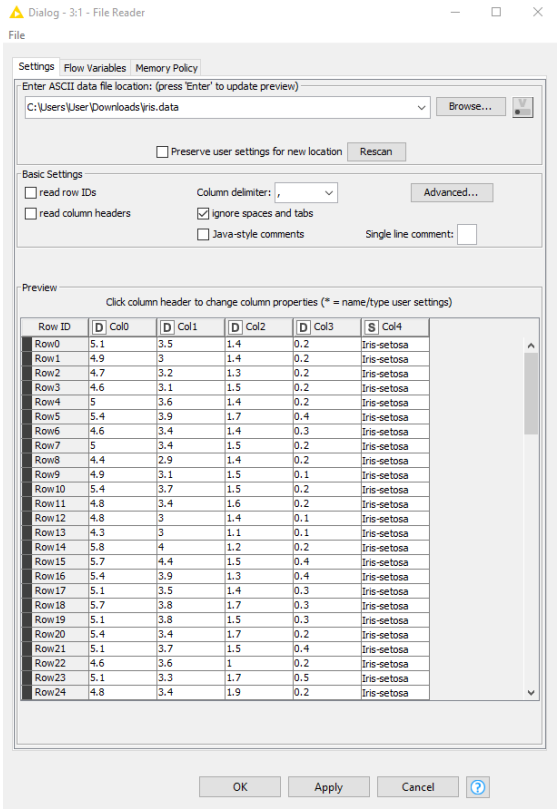
- **KNIME Analytics Platform** download link: https://www.knime.com/downloads/download-knime
  (It is recommender to download the installer version 561 MB for Windows)
- **Example Data set, Iris Data** https://archive.ics.uci.edu/ml/machine-learning-databases/iris/

**Objective:**

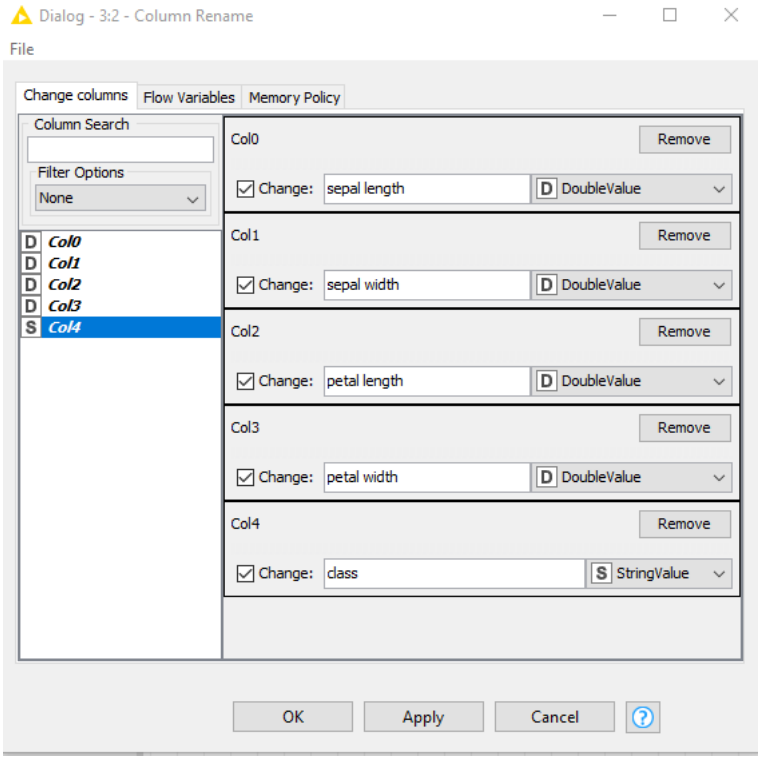
- Implement decision tree classifier using KNIME on a sample data set

## Instructions:

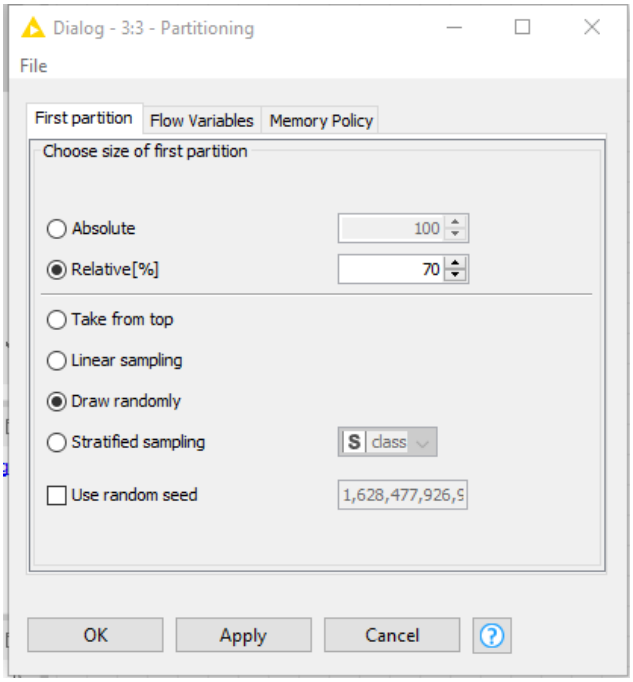
1. Open the KNIME software installed on your computer and create a new workflow
2. Select a data set of your choice from the given link (https://archive.ics.uci.edu/ml/index.php ) and open the file using the appropriate node reader.
3. Execute the **File Reader** node and observe data through the ***File Table*** option.



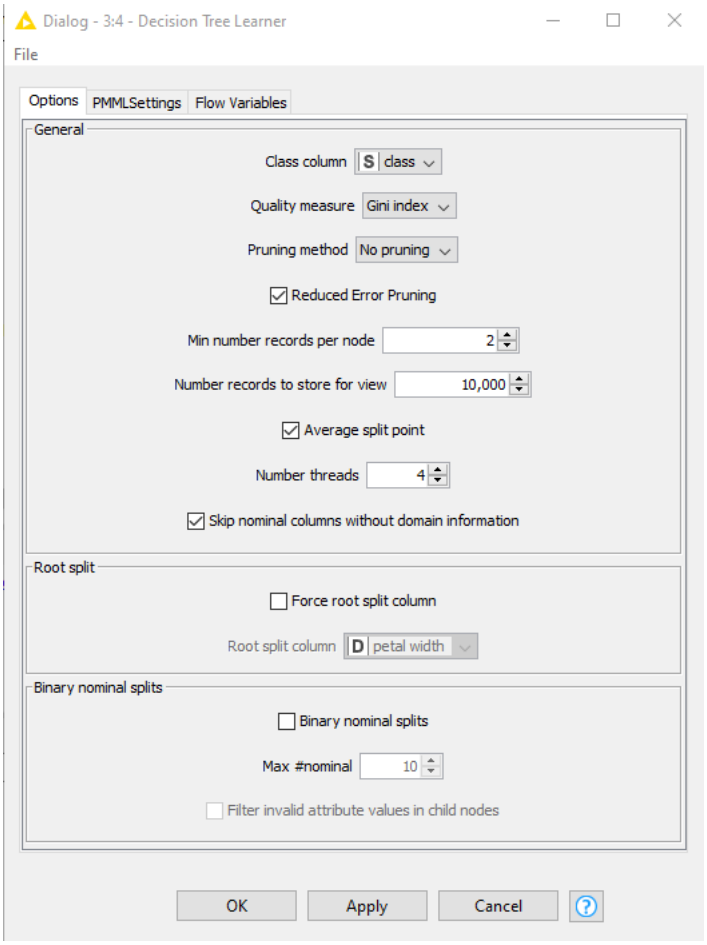
**4.** To rename the column names, use the "Column Rename" node and rename as follows:

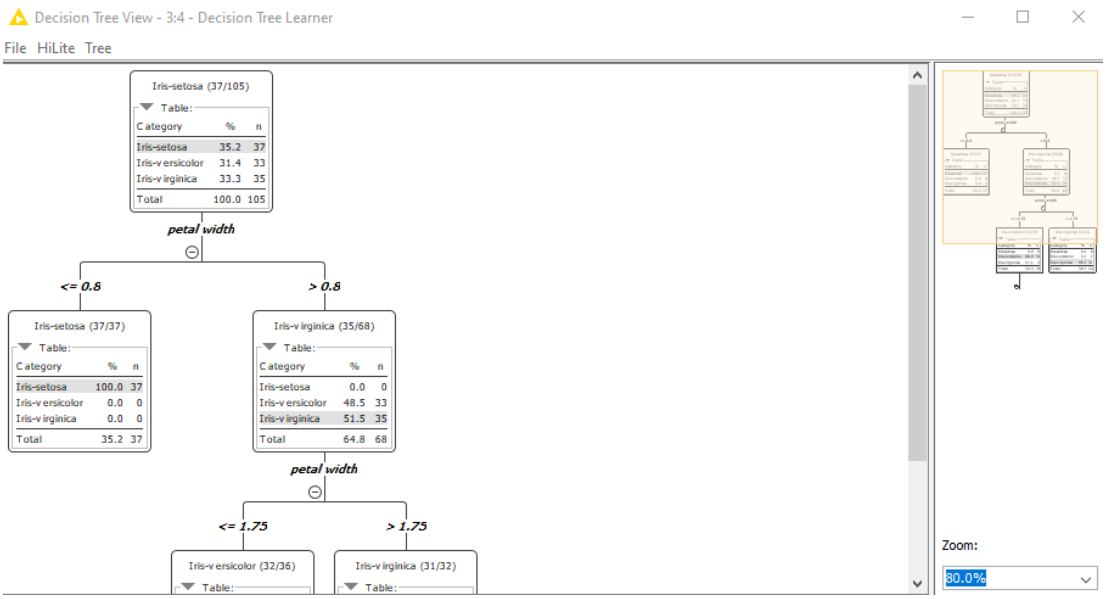



**5.** Now, to split the data set into training and testing, use the "**Partitioning**" node and configure as follows:

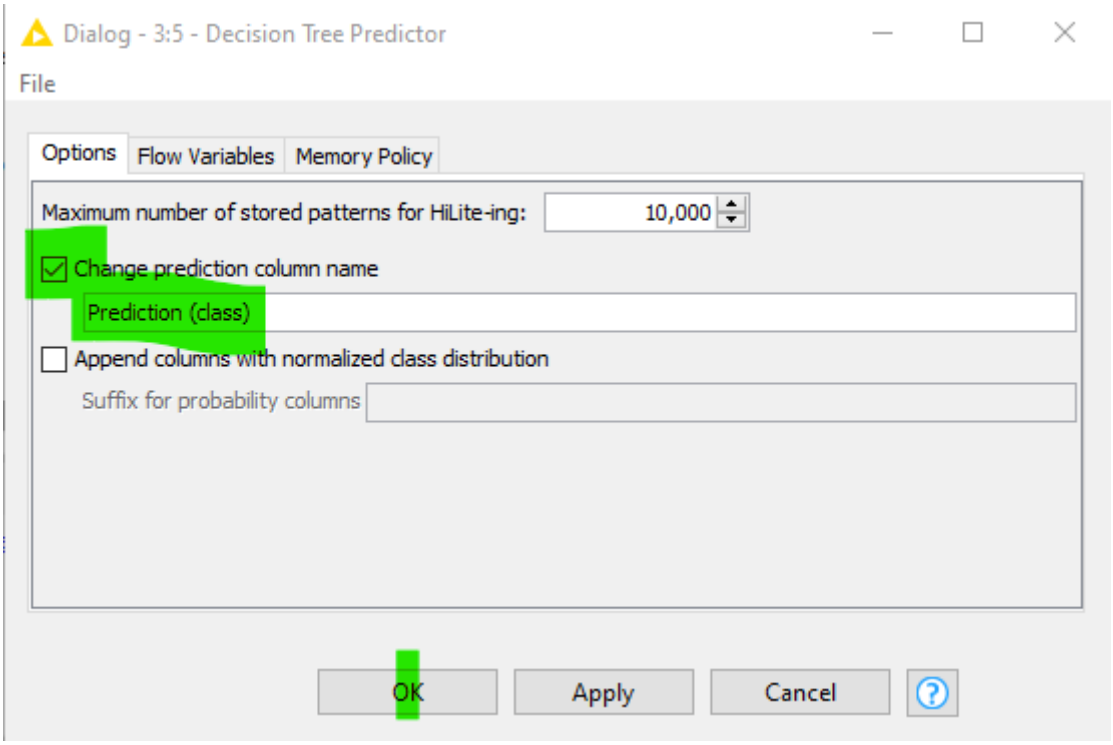


6. Next, connect the "**Decision Tree Learner**" node with the first output port of the **Partitioning** node and configure the learner node. Then execute the node and observe the decision tree view.

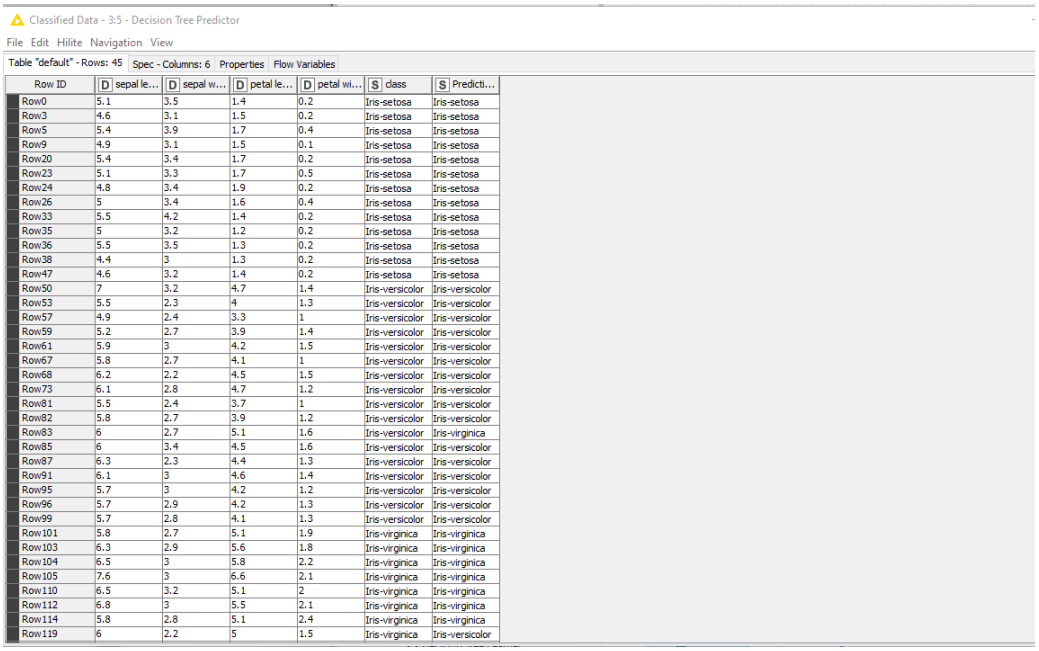


**7.** To test the model, take the "Decision tree predictor" node and connect it with the second output port of the Partitioning node and decision tree learner node. Once the connections are made, configure the predictor node.




You can look at the predictions by right-clicking on the predictor node and then selecting *Classified Data*.

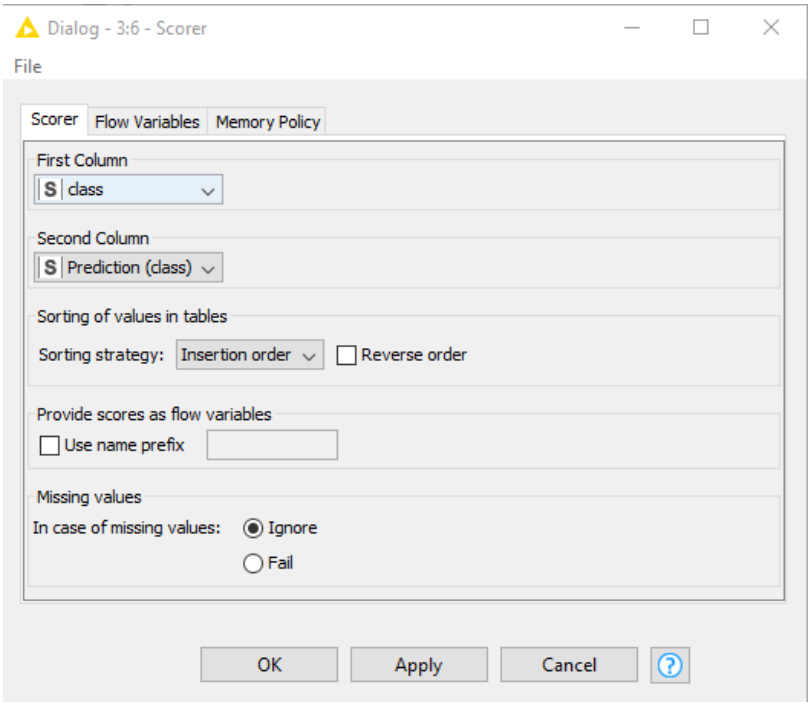

Classified Data - 3:5 - Decision Tree Predictor

File Edit Hilite Navigation View

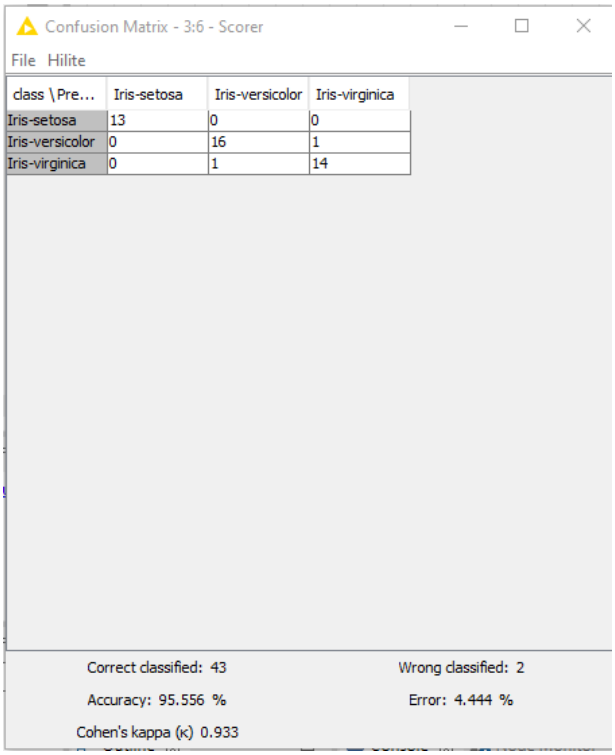
Table "default" - Rows: 45 | Spec - Columns: 6 | Properties | Flow Variables

| Row ID | D sepal le... | D sepal w... | D petal le... | D petal wi... | S class | S Predicti... |
|---|---|---|---|---|---|---|
| Row0 | 5.1 | 3.5 | 1.4 | 0.2 | Iris-setosa | Iris-setosa |
| Row3 | 4.6 | 3.1 | 1.5 | 0.2 | Iris-setosa | Iris-setosa |
| Row5 | 5.4 | 3.9 | 1.7 | 0.4 | Iris-setosa | Iris-setosa |
| Row9 | 4.9 | 3.1 | 1.5 | 0.1 | Iris-setosa | Iris-setosa |
| Row20 | 5.4 | 3.4 | 1.7 | 0.2 | Iris-setosa | Iris-setosa |
| Row23 | 5.1 | 3.3 | 1.7 | 0.5 | Iris-setosa | Iris-setosa |
| Row24 | 4.8 | 3.4 | 1.9 | 0.2 | Iris-setosa | Iris-setosa |
| Row26 | 5 | 3.4 | 1.6 | 0.4 | Iris-setosa | Iris-setosa |
| Row33 | 5.5 | 4.2 | 1.4 | 0.2 | Iris-setosa | Iris-setosa |
| Row35 | 5 | 3.2 | 1.2 | 0.2 | Iris-setosa | Iris-setosa |
| Row36 | 5.5 | 3.5 | 1.3 | 0.2 | Iris-setosa | Iris-setosa |
| Row38 | 4.4 | 3 | 1.3 | 0.2 | Iris-setosa | Iris-setosa |
| Row47 | 4.6 | 3.2 | 1.4 | 0.2 | Iris-setosa | Iris-setosa |
| Row50 | 7 | 3.2 | 4.7 | 1.4 | Iris-versicolor | Iris-versicolor |
| Row53 | 5.5 | 2.3 | 4 | 1.3 | Iris-versicolor | Iris-versicolor |
| Row57 | 4.9 | 2.4 | 3.3 | 1 | Iris-versicolor | Iris-versicolor |
| Row59 | 5.2 | 2.7 | 3.9 | 1.4 | Iris-versicolor | Iris-versicolor |
| Row61 | 5.9 | 3 | 4.2 | 1.5 | Iris-versicolor | Iris-versicolor |
| Row67 | 5.8 | 2.7 | 4.1 | 1 | Iris-versicolor | Iris-versicolor |
| Row68 | 6.2 | 2.2 | 4.5 | 1.5 | Iris-versicolor | Iris-versicolor |
| Row73 | 6.1 | 2.8 | 4.7 | 1.2 | Iris-versicolor | Iris-versicolor |
| Row81 | 5.5 | 2.4 | 3.7 | 1 | Iris-versicolor | Iris-versicolor |
| Row82 | 5.8 | 2.7 | 3.9 | 1.2 | Iris-versicolor | Iris-versicolor |
| Row83 | 6 | 2.7 | 5.1 | 1.6 | Iris-versicolor | Iris-virginica |
| Row85 | 6 | 3.4 | 4.5 | 1.6 | Iris-versicolor | Iris-versicolor |
| Row87 | 6.3 | 2.3 | 4.4 | 1.3 | Iris-versicolor | Iris-versicolor |
| Row91 | 6.1 | 3 | 4.6 | 1.4 | Iris-versicolor | Iris-versicolor |
| Row95 | 5.7 | 3 | 4.2 | 1.2 | Iris-versicolor | Iris-versicolor |
| Row96 | 5.7 | 2.9 | 4.2 | 1.3 | Iris-versicolor | Iris-versicolor |
| Row99 | 5.7 | 2.8 | 4.1 | 1.3 | Iris-versicolor | Iris-versicolor |
| Row101 | 5.8 | 2.7 | 5.1 | 1.9 | Iris-virginica | Iris-virginica |
| Row103 | 6.3 | 2.9 | 5.6 | 1.8 | Iris-virginica | Iris-virginica |
| Row104 | 6.5 | 3 | 5.8 | 2.2 | Iris-virginica | Iris-virginica |
| Row105 | 7.6 | 3 | 6.6 | 2.1 | Iris-virginica | Iris-virginica |
| Row110 | 6.5 | 3.2 | 5.1 | 2 | Iris-virginica | Iris-virginica |
| Row112 | 6.8 | 3 | 5.5 | 2.1 | Iris-virginica | Iris-virginica |
| Row114 | 5.8 | 2.8 | 5.1 | 2.4 | Iris-virginica | Iris-virginica |
| Row119 | 6 | 2.2 | 5 | 1.5 | Iris-virginica | Iris-versicolor |

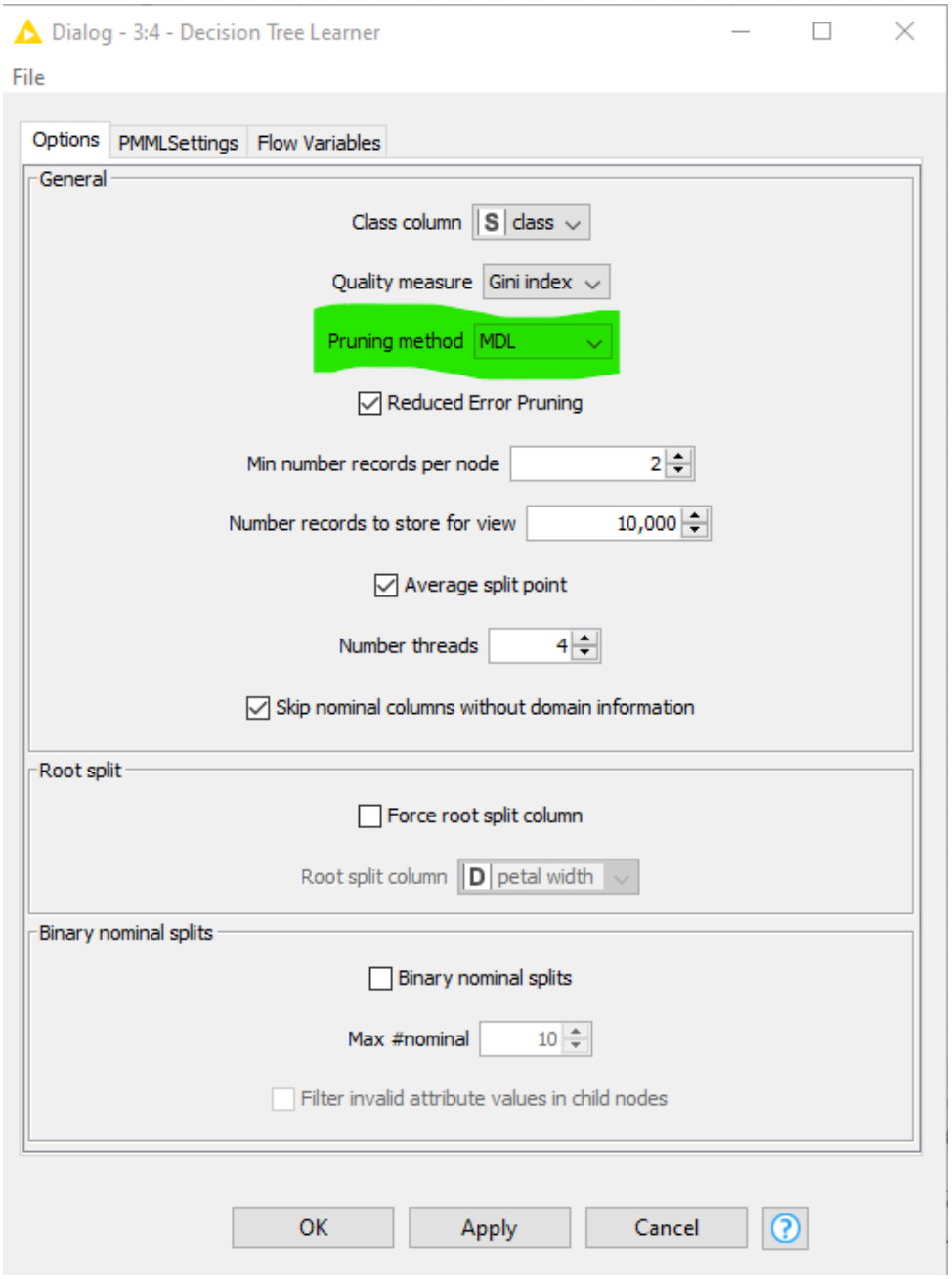
**8.** Lastly, to calculate the accuracy statistics, connect the ***Scorer*** node with the predictor node and configure it.

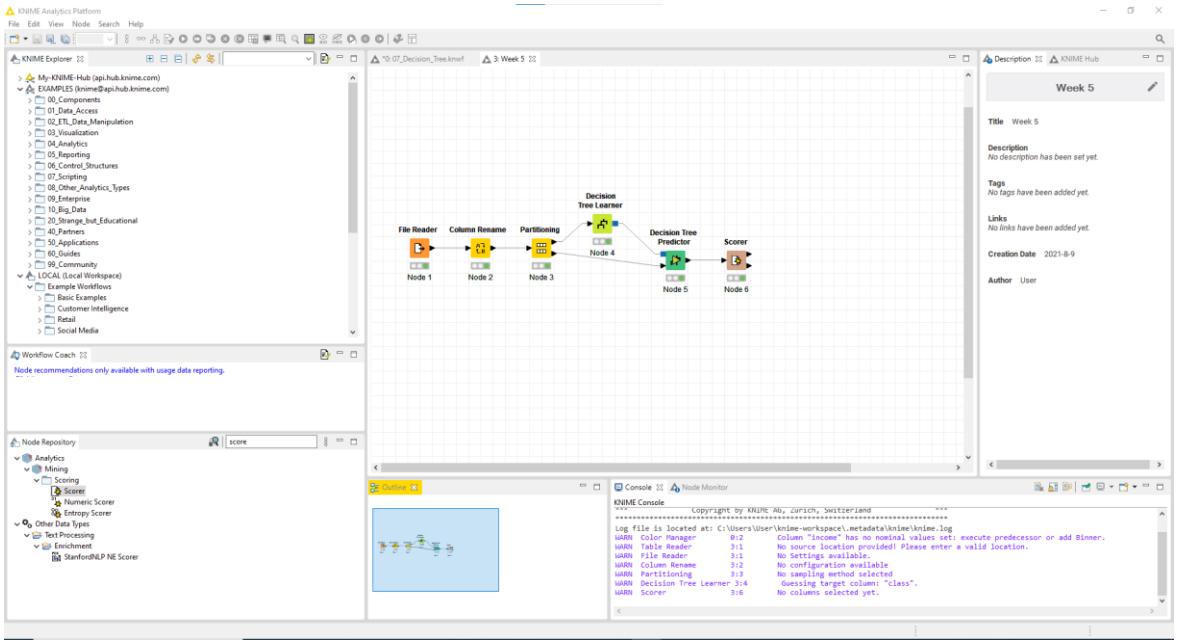



Once the configuration is done, execute the node and select "View: Confusion Matrix" to get the accuracy rate of the model.



**9.** Now, go back the learner node and select the pruning method. Then execute the model again and observe the accuracy statistics. Is there any changes?




File Reader
Column Rename
Partitioning
Decision Tree Learner
Decision Tree Predictor
Scorer
Node 1
Node 2
Node 3
Node 4
Node 5
Node 6
Week 5