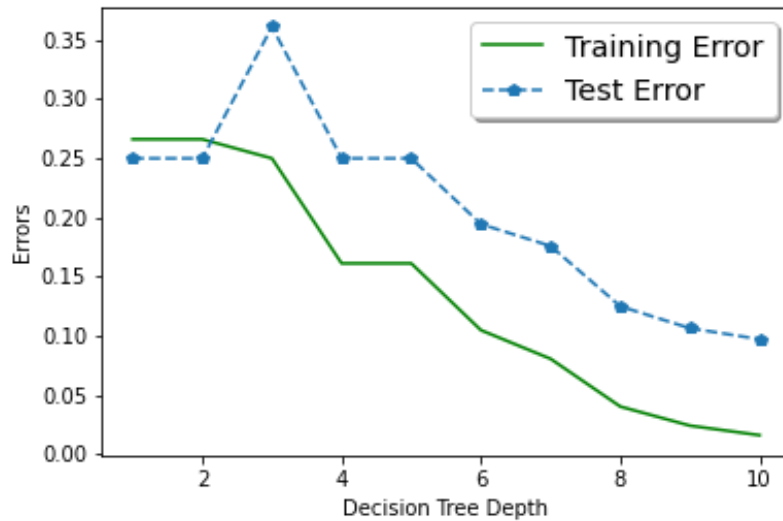


Programming Assignment -1:

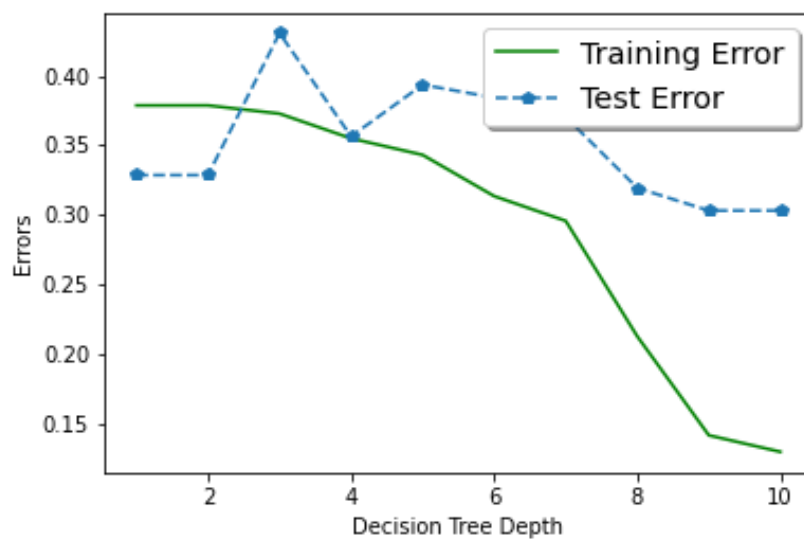
Tarun Punhani – TXP190029

Kiran Devaraj Raj – KXR190038

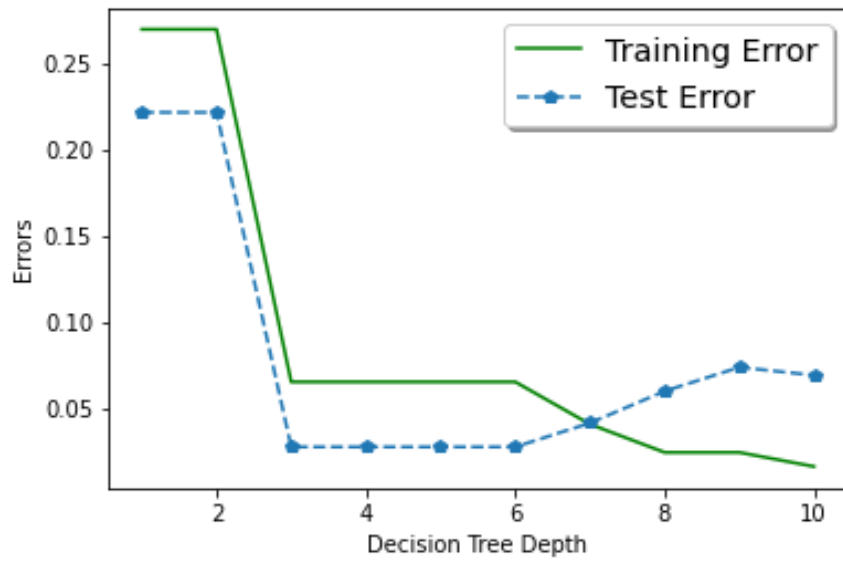
a) Monks-1 Data set graph:



Monks-2 Data set graph:



Monks 3 Data set graph:



b) Tree and confusion matrix for depth = 1 in monks-1 data set

```
TREE
+-- [SPLIT: x4 = 1]
|   +-- [LABEL = 0]
+-- [SPLIT: x4 = 1]
|   +-- [LABEL = 1]
Test Error = 25.00%.
Train Error = 46.77%.
```

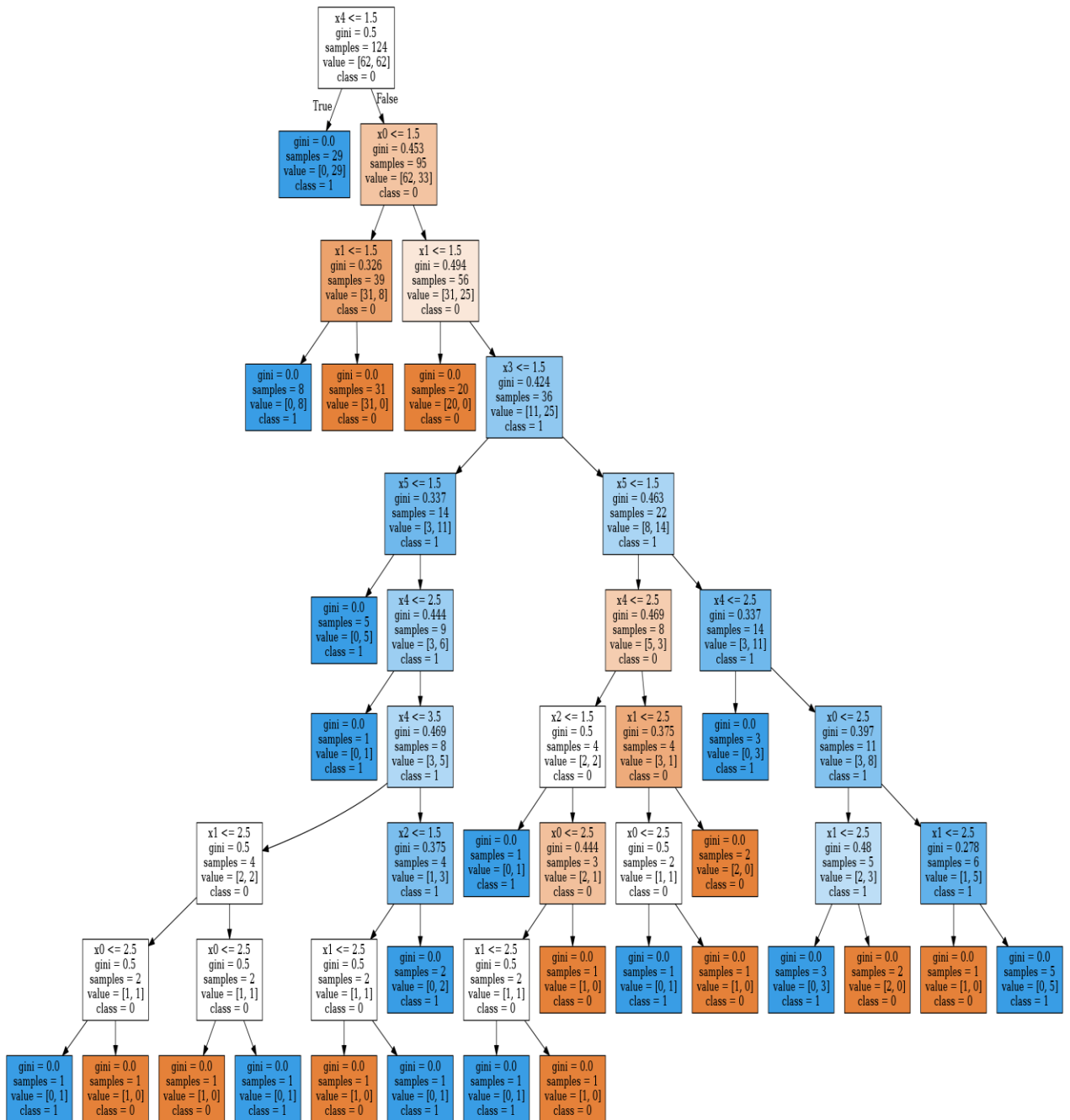
```
Confusion Matrix
[[216  0]
 [108 108]]
```

Tree and confusion matrix for depth = 2 in monks-1 data set

```
TREE
+-- [SPLIT: x4 = 1]
|   +-- [SPLIT: x3 = 2]
|       +-- [LABEL = 0]
|       +-- [SPLIT: x3 = 2]
|           +-- [LABEL = 0]
+-- [SPLIT: x4 = 1]
|   +-- [LABEL = 1]
Test Error = 25.00%.
Train Error = 46.77%.
```

```
Confusion Matrix
[[216  0]
 [108 108]]
```

c) Decision Tree from Scikit:



Confusion Matrix:

```
learn_decision_tree_from_scikit()
[[216  0]
 [108 108]]
```

d) Tree and confusion matrix for depth=1 for SPECT data set:

```
TREE
+-- [SPLIT: x16 = 1]
|   +-- [LABEL = 0]
+-- [SPLIT: x16 = 1]
|   +-- [LABEL = 1]
Test Error = 75.94%.
Train Error = 52.50%.
```

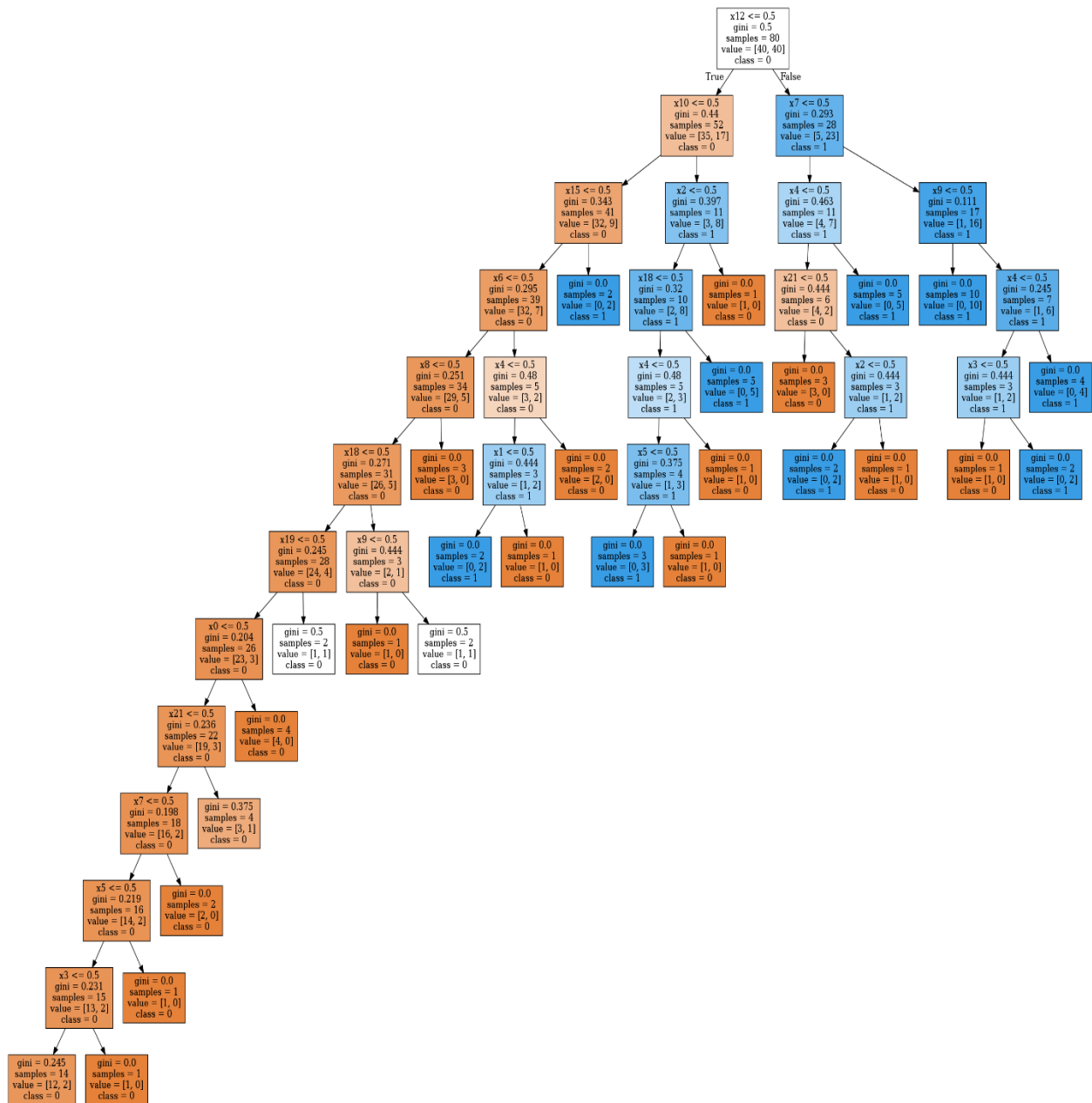
```
Confusion Matrix
[[ 15  0]
 [142 30]]
```

Tree and confusion matrix for depth=2 for SPECT data set:

```
TREE
+-- [SPLIT: x16 = 1]
|   +-- [SPLIT: x17 = 1]
|       |   +-- [LABEL = 0]
|       +-- [SPLIT: x17 = 1]
|           |   +-- [LABEL = 1]
+-- [SPLIT: x16 = 1]
|   +-- [LABEL = 1]
Test Error = 67.38%.
Train Error = 50.00%.
```

```
Confusion Matrix
[[ 15  0]
 [126 46]]
```

Decision Tree of SPECT data set from Scikit:



Confusion Matrix:

```
learn_decision_tree_from_scikit()

[[ 15  0]
 [126 46]]
```