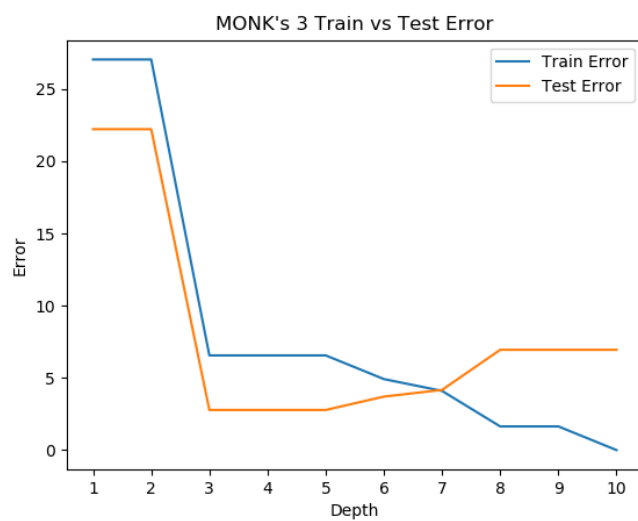
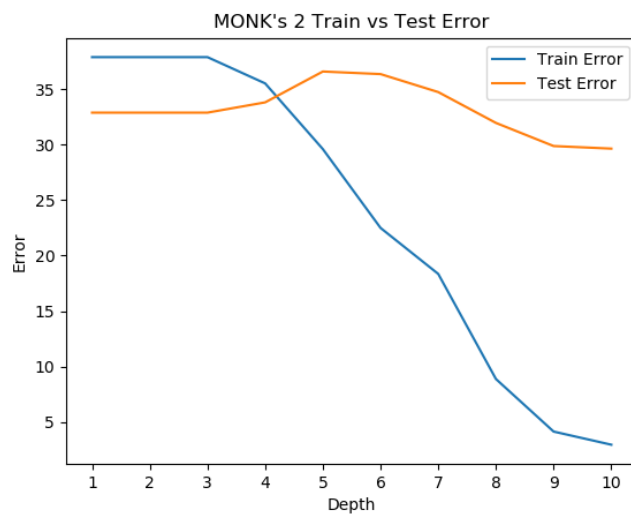
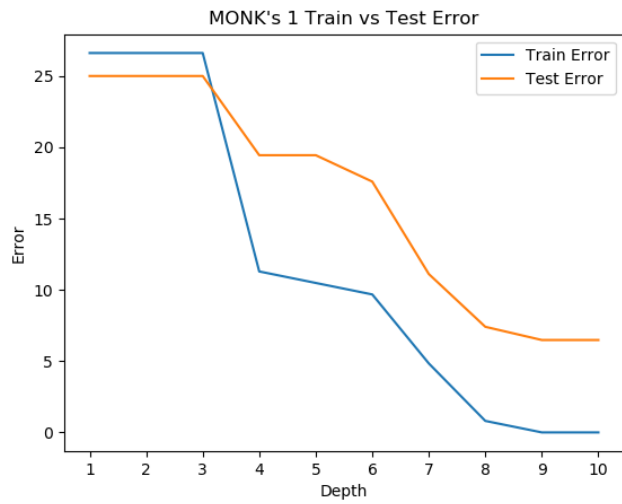


# Programming Assignment 1

(Submitted By: AXM190041, PXN190012)

a. Plots for depth=1...10 for monks 1,2,3



**b. Monks-1, Depth=1**

Learned Decision Tree

```
TREE
+-- [SPLIT: x4 = 1]
|   +-- [LABEL = 1]
+-- [SPLIT: x4 = 1]
|   +-- [LABEL = 0]
```

Confusion Matrix

**Classifier Values**

		Positive	Negative
Actual Values	Positive	108	108
	Negative	0	216

**Monks-1, Depth=2**

Learned Decision Tree

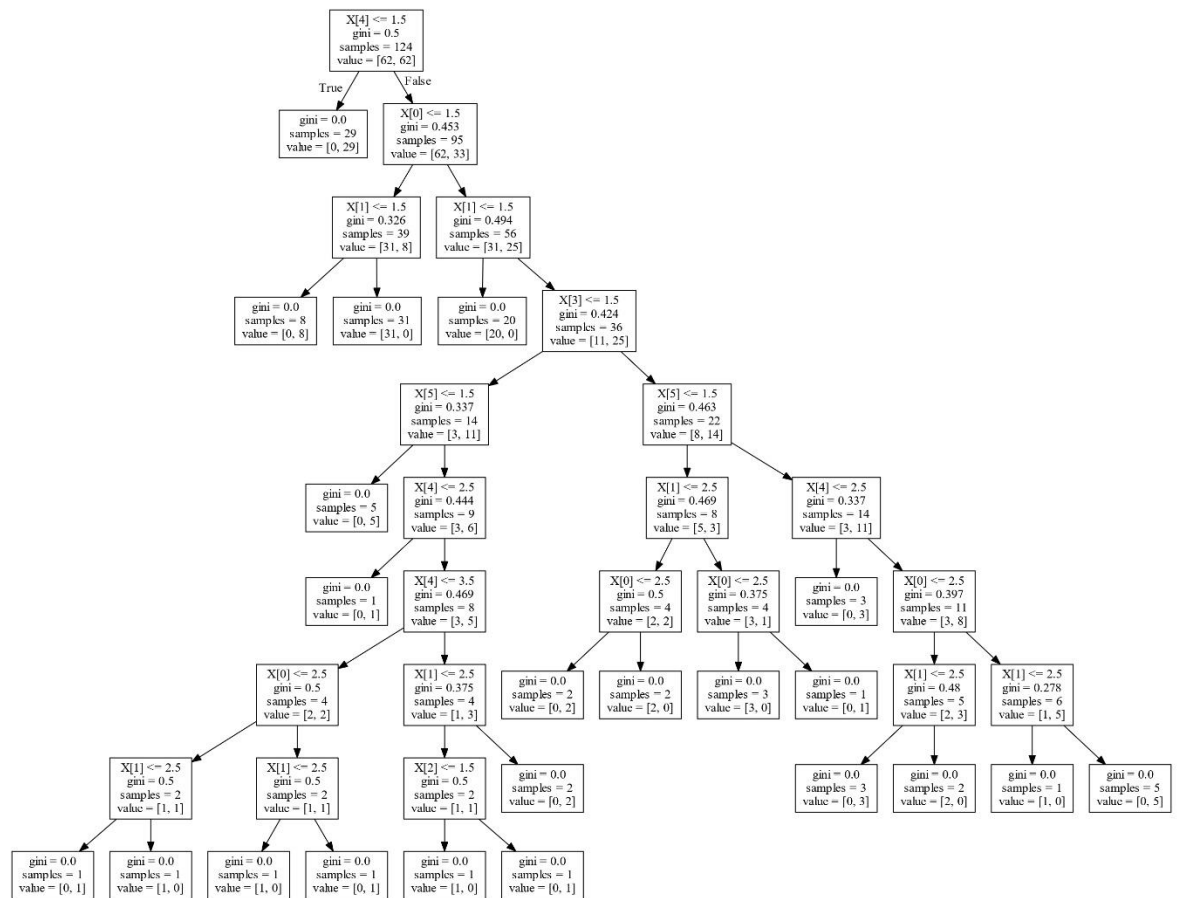
```
TREE
+-- [SPLIT: x4 = 1]
|   +-- [LABEL = 1]
+-- [SPLIT: x4 = 1]
|   +-- [SPLIT: x3 = 2]
|       |   +-- [LABEL = 0]
|       +-- [SPLIT: x3 = 2]
|           |   +-- [LABEL = 0]
```

Confusion Matrix

**Classifier Values**

		Positive	Negative
Actual Values	Positive	108	108
	Negative	0	216

c. Scikit-learn default decision tree for Monks-1  
(attached image in zip file with report)



Confusion Matrix

**Classifier Values**

		Positive	Negative
Actual Values	Positive	216	0
	Negative	24	192

d. **Balance-scale, Depth=1**

Learned Decision Tree

```
TREE
+-- [SPLIT: x2 = 0]
|   +-- [LABEL = 1]
+-- [SPLIT: x2 = 0]
|   +-- [LABEL = 2]
```

Confusion Matrix

		Classifier Values	
		Positive	Negative
Actual Values	Positive	27	126
	Negative	4	0

**Balance-scale, Depth=2**

Learned Decision Tree

```
TREE
+-- [SPLIT: x2 = 0]
|   +-- [SPLIT: x0 = 4]
|   |   +-- [LABEL = 1]
|   |   +-- [SPLIT: x0 = 4]
|   |   |   +-- [LABEL = 1]
+-- [SPLIT: x2 = 0]
|   +-- [SPLIT: x0 = 0]
|   |   +-- [LABEL = 2]
|   |   +-- [SPLIT: x0 = 0]
|   |   |   +-- [LABEL = 1]
```

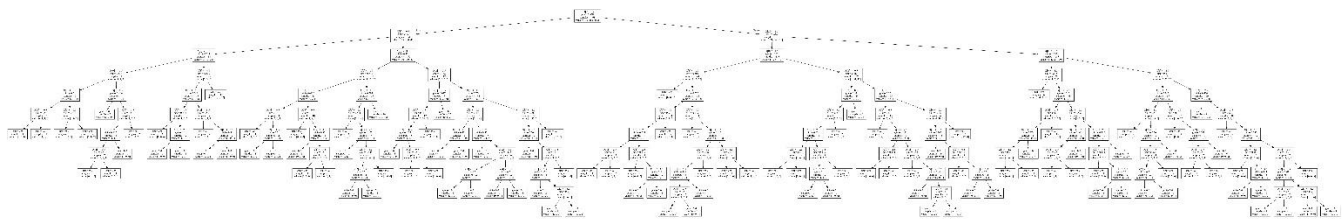
Confusion Matrix

		Classifier Values	
		Positive	Negative
Actual Values	Positive	70	75
	Negative	12	0

**Balance-scale using Scikit-learn**

Tree using graphviz

(attached image in zip file with report)



Confusion Matrix

		Classifier Values	
		Positive	Negative
Actual Values	Positive	58	93
	Negative	6	0