Group Participant

- **Frederik Arwin**   - **ajf220004**
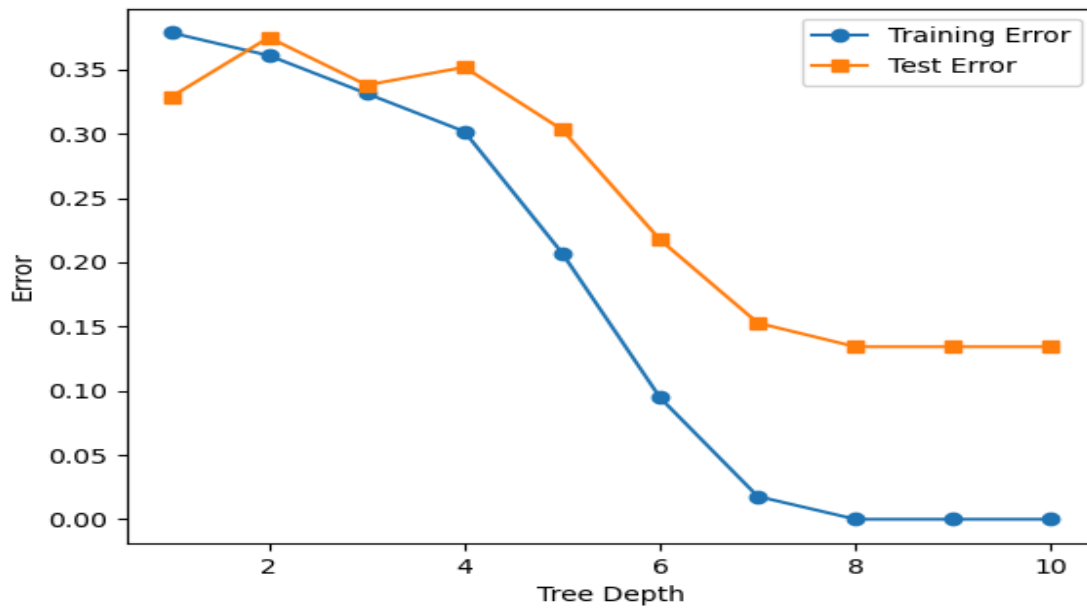- **Karl Azangue**   - **kka210001**

Part - A
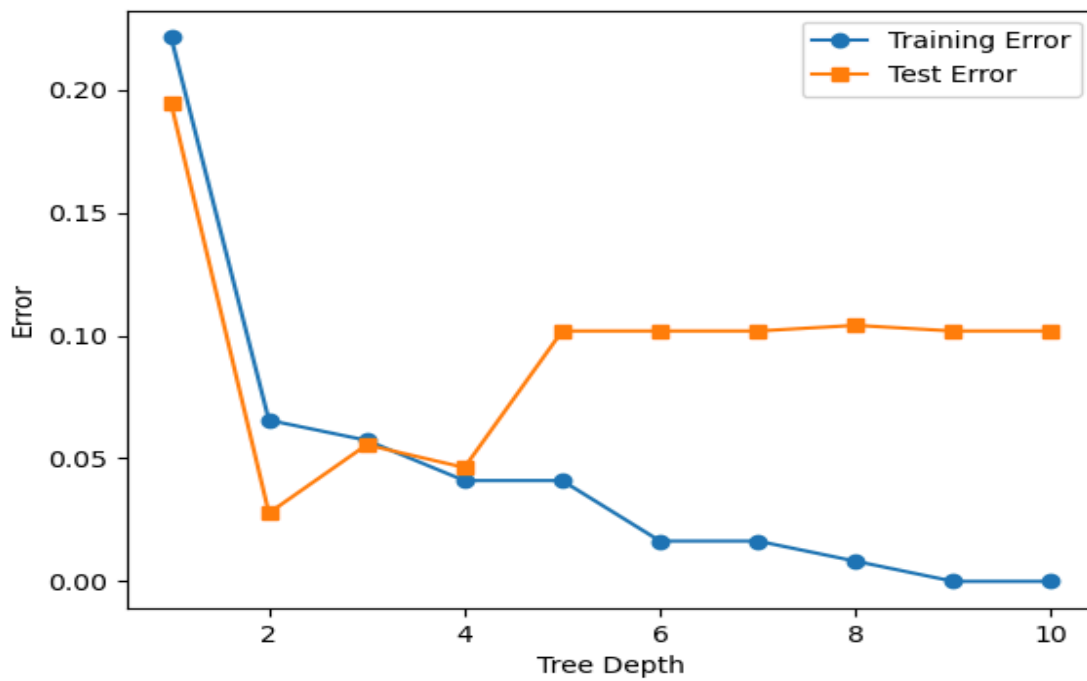
Model - 1
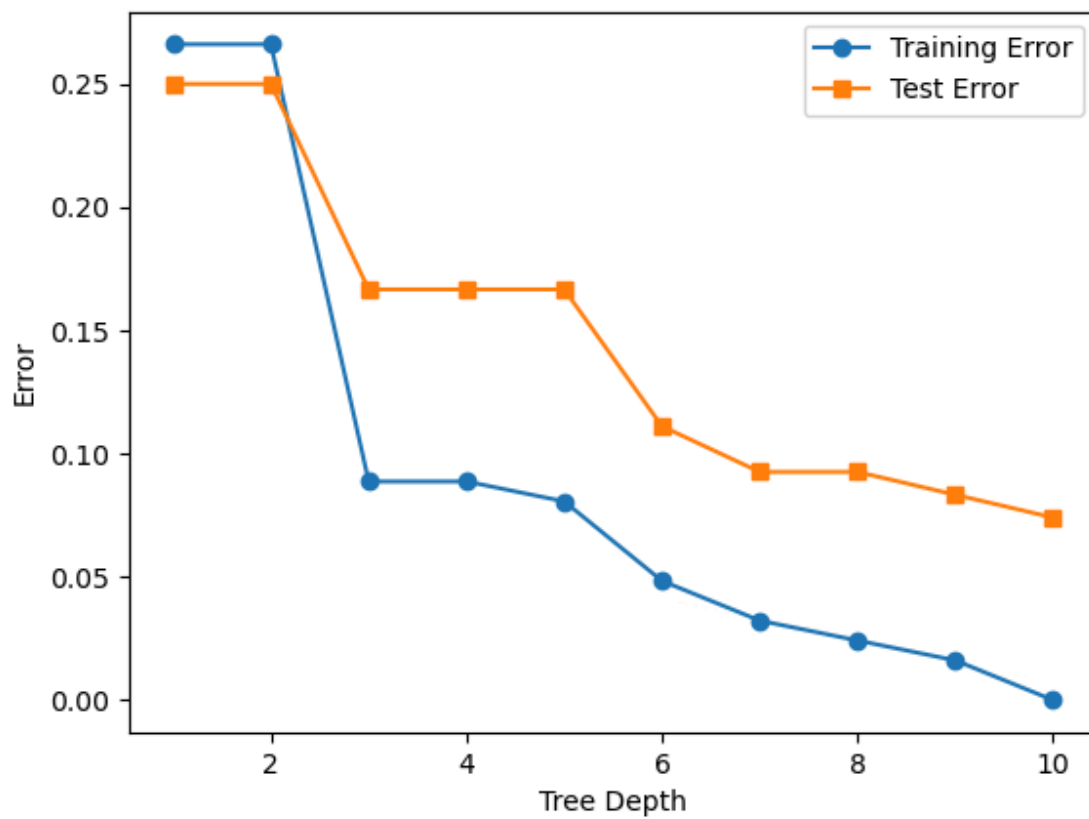
Model - 2

Model - 3

Problem B

```
======== (PART B) ========
=== Decision Tree (Depth=1) ===
TREE
+-- [SPLIT: x4 = 1]
|       +-- [LABEL = 1]
+-- [SPLIT: x4 = 1]
|       +-- [LABEL = 0]

Confusion Matrix (Depth=1):
[[108 108]
 [  0 216]]


=== Decision Tree (Depth=2) ===
TREE
+-- [SPLIT: x4 = 1]
|       +-- [LABEL = 1]
+-- [SPLIT: x4 = 1]
|       +-- [SPLIT: x0 = 1]
|       |       +-- [LABEL = 0]
|       +-- [SPLIT: x0 = 1]
|       |       +-- [LABEL = 0]

Confusion Matrix (Depth=2):
[[108 108]
 [  0 216]]
```
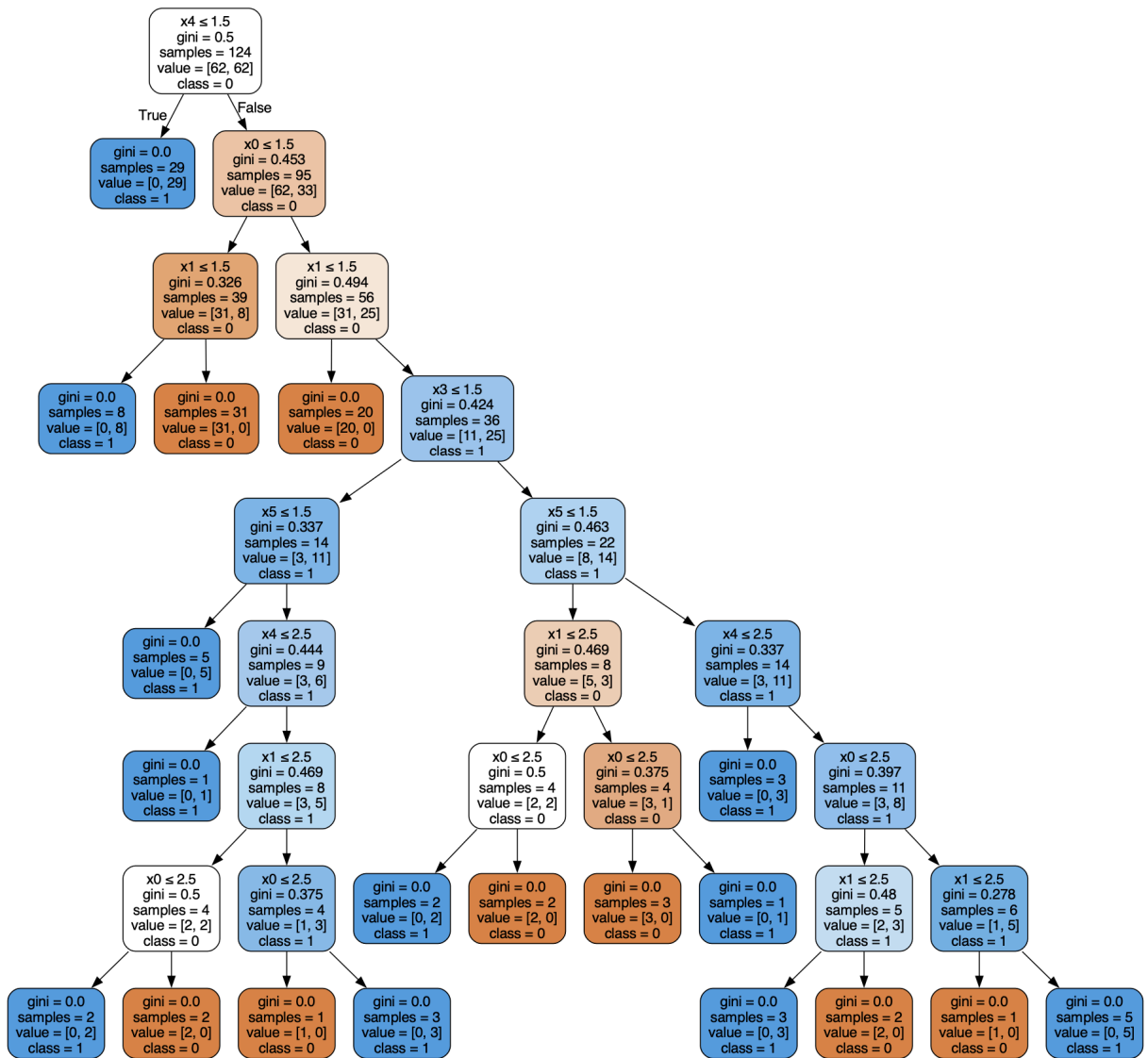
Problem C

```
PROBLEMS    OUTPUT    TERMINAL    PORTS    DEBUG CONSOLE

● (base) kazangue@Kaneshi HW-2 % python arwin.py

  === scikit-learn Decision Tree (Default Parameters) ===
  Confusion Matrix (scikit-learn):
  [[189  27]
   [  1 215]]
  The scikit-learn decision tree has been saved as 'monks1_sklearn_tree.pdf'.
○ (base) kazangue@Kaneshi HW-2 % 
```

Visualized decision tree:

Part D - Used the BREAST CANCER DATASET

```
=== Decision Tree (Depth=1) ===
TREE
+-- [SPLIT: x22 = 0.0]
|       +-- [LABEL = 1]
+-- [SPLIT: x22 = 0.0]
|       +-- [LABEL = 0]

Confusion Matrix (Depth=1):
[[118  14]
 [  2  37]]

=== Decision Tree (Depth=2) ===
TREE
+-- [SPLIT: x22 = 0.0]
|       +-- [SPLIT: x27 = 0.0]
|       |       +-- [LABEL = 1]
|       +-- [SPLIT: x27 = 0.0]
|       |       +-- [LABEL = 1]
+-- [SPLIT: x22 = 0.0]
|       +-- [SPLIT: x6 = 0.0]
|       |       +-- [LABEL = 0]
|       +-- [SPLIT: x6 = 0.0]
|       |       +-- [LABEL = 0]

Confusion Matrix (Depth=2):
[[118  14]
 [  2  37]]
Confusion Matrix (scikit-learn):
[[ 37   2]
 [ 11 121]]
○ (base) kazangue@Kaneshi HW-2 %
```

Visualized decision tree: