ML LAB_3

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Course: Machine Learning Lab
Experiment: Lab 3 – Implementation of ID3 Decision Tree

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1. Introduction

The objective of this lab is to implement the ID3 Decision Tree algorithm and analyze its performance across three datasets: Mushroom Classification, Tic-Tac-Toe Endgame, and Nursery School Admissions. The results were evaluated using accuracy, precision, recall, F1-score, and tree complexity metrics. The aim is to understand how dataset characteristics affect decision tree performance.

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2. Observations

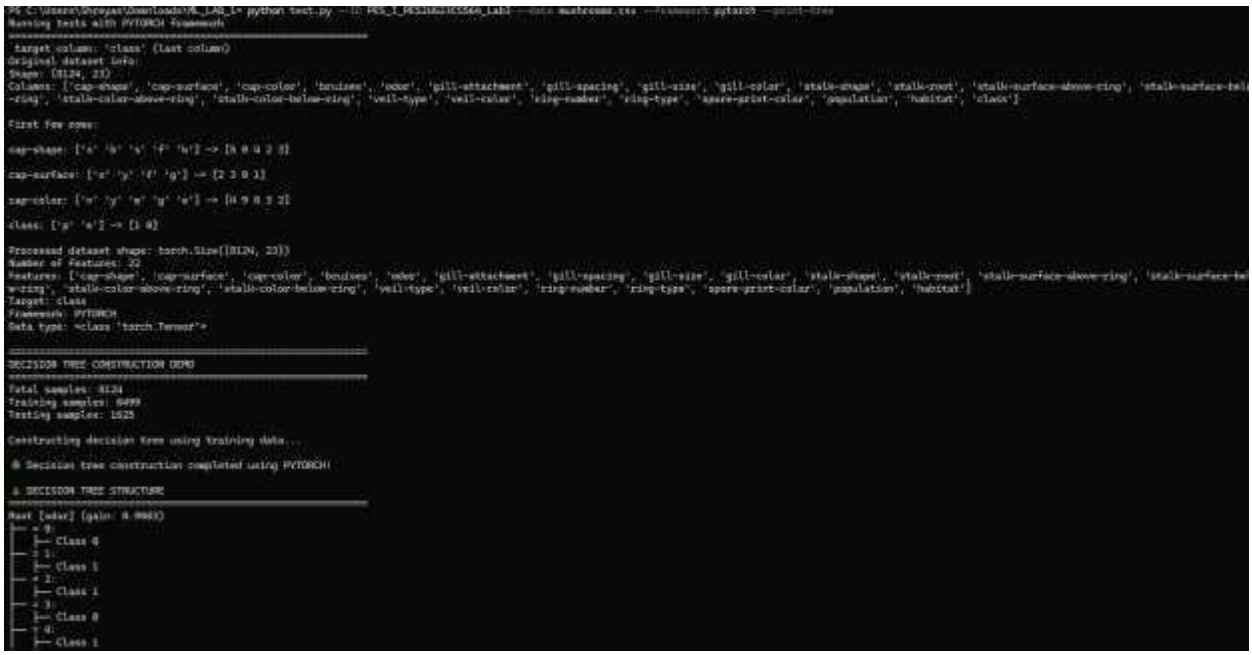
Mushroom Dataset

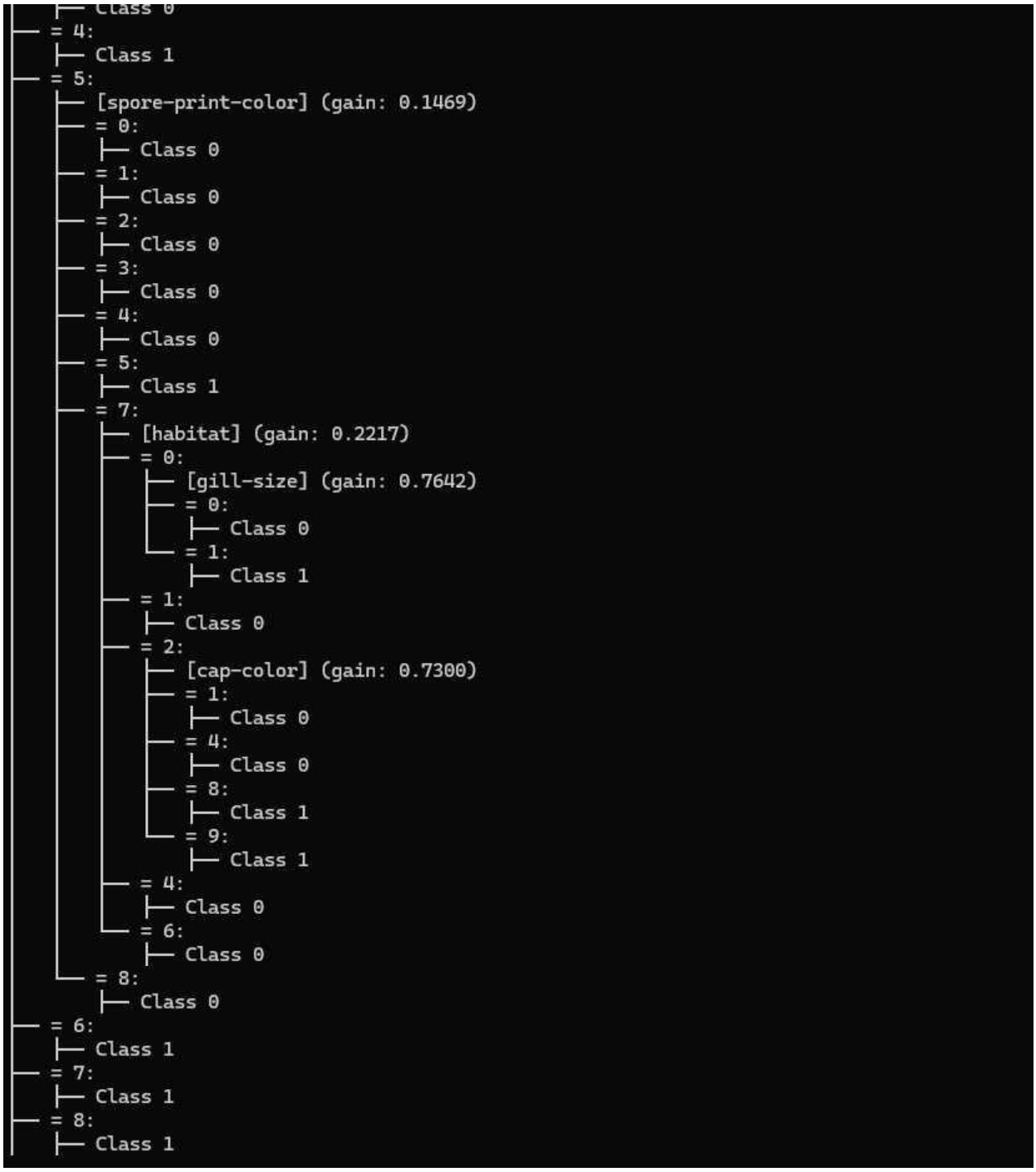
- **Accuracy**: 100%
- **Precision/Recall/F1**: 1.0 for all metrics.
- **Tree Depth**: 4
- **Total Nodes**: 29 (24 leaves, 5 internal).
- **Remarks**:
  - Perfect classification due to highly discriminative features like *odor* and *sporeprint color*.
  - Very small and interpretable tree.
  - No signs of overfitting.

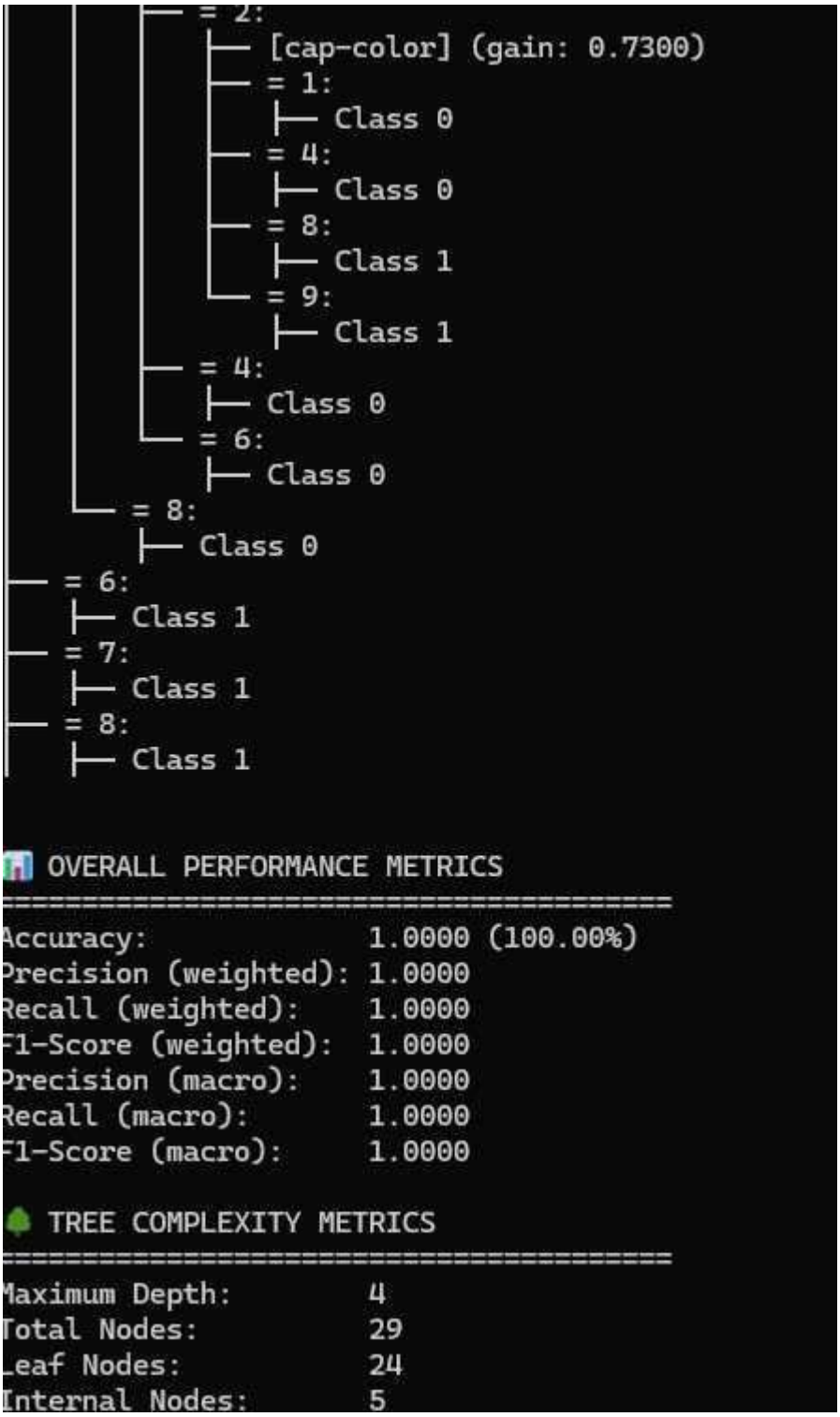
Performance Matrix (Mushroom Dataset):

```
📊 OVERALL PERFORMANCE METRICS
==========================================
Accuracy:              1.0000 (100.00%)
Precision (weighted):  1.0000
Recall (weighted):     1.0000
F1-Score (weighted):   1.0000
Precision (macro):     1.0000
Recall (macro):        1.0000
F1-Score (macro):      1.0000

🌳 TREE COMPLEXITY METRICS
==========================================
Maximum Depth:         4
Total Nodes:           29
Leaf Nodes:            24
Internal Nodes:        5
```




├── Class 0
├── = 4:
│   ├── Class 1
├── = 5:
│   ├── [spore-print-color] (gain: 0.1469)
│   ├── = 0:
│   │   ├── Class 0
│   ├── = 1:
│   │   ├── Class 0
│   ├── = 2:
│   │   ├── Class 0
│   ├── = 3:
│   │   ├── Class 0
│   ├── = 4:
│   │   ├── Class 0
│   ├── = 5:
│   │   ├── Class 1
│   ├── = 7:
│   │   ├── [habitat] (gain: 0.2217)
│   │   ├── = 0:
│   │   │   ├── [gill-size] (gain: 0.7642)
│   │   │   ├── = 0:
│   │   │   │   ├── Class 0
│   │   │   └── = 1:
│   │   │   ├── Class 1
│   │   ├── = 1:
│   │   │   ├── Class 0
│   │   ├── = 2:
│   │   │   ├── [cap-color] (gain: 0.7300)
│   │   │   ├── = 1:
│   │   │   │   ├── Class 0
│   │   │   ├── = 4:
│   │   │   │   ├── Class 0
│   │   │   ├── = 8:
│   │   │   │   ├── Class 1
│   │   │   └── = 9:
│   │   │   ├── Class 1
│   │   ├── = 4:
│   │   │   ├── Class 0
│   │   └── = 6:
│   │   ├── Class 0
│   └── = 8:
│   ├── Class 0
├── = 6:
│   ├── Class 1
├── = 7:
│   ├── Class 1
├── = 8:
│   ├── Class 1

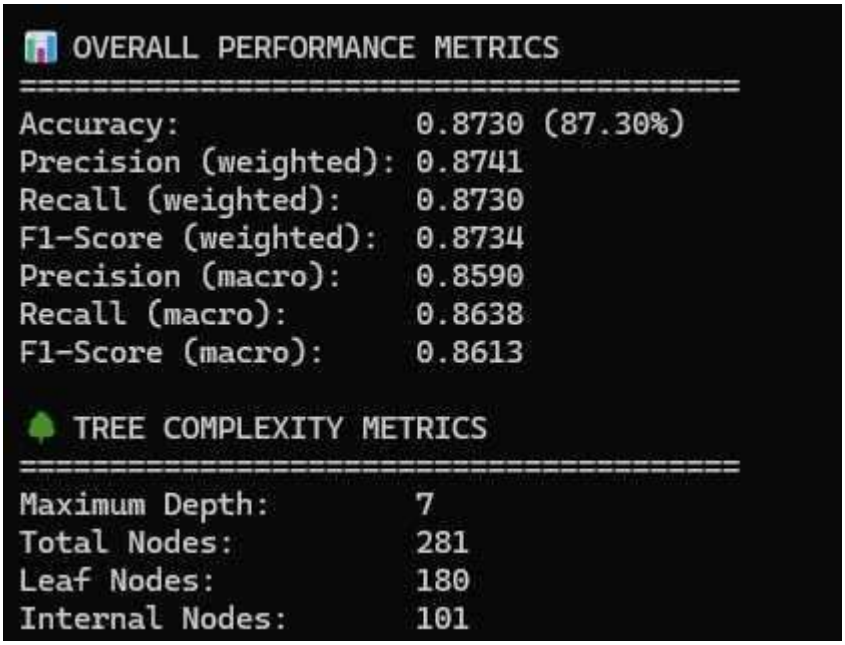


Tic-Tac-Toe Dataset

- **Accuracy**: 87.30%

- **Precision/Recall/F1 (weighted)**: ~0.87
- **Precision/Recall/F1 (macro)**: ~0.86
- **Tree Depth**: 7
- **Total Nodes**: 281 (180 leaves, 101 internal).
- **Remarks**:
    - The dataset is complex because many board states look similar but have different outcomes.
    - Accuracy is moderate and the tree is deeper, suggesting difficulty in generalizing rules.
    - Possible overfitting as the tree grows large without achieving very high accuracy.

Performance Matrix (Tictactoe Dataset):

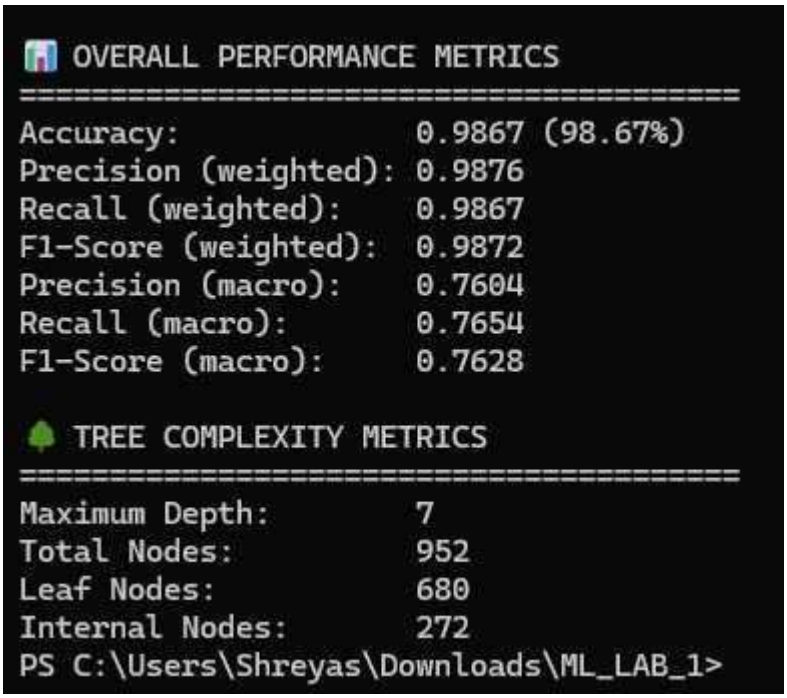


Nursery Dataset

- **Accuracy**: 98.67%
- **Precision/Recall/F1 (weighted)**: ~0.98
- **Precision/Recall/F1 (macro)**: ~0.76

- **Tree Depth**: 7
- **Total Nodes**: 952 (680 leaves, 272 internal).
- **Remarks**:
    - Excellent weighted accuracy, but macro values are lower due to class imbalance.
    - The tree is very large, reflecting the dataset's size and multi-class nature.

Performance Matrix (Nursery Dataset):



3. Comparative Analysis

Dataset	Accuracy	Tree Depth	Total Nodes	Remarks
Mushroom	100%	4	29	Perfect, small tree, clean data
Tic-Tac-To	87.3%	7	281	Ambiguous states, moderate accuracy e
Nursery	98.67%	7	952	Very high accuracy, imbalance affects minority classes

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Best Performing Dataset: Mushroom → because of highly discriminative features and balanced data.

- **Most Complex Tree**: Nursery → large number of attributes and classes increases tree size.
- **Lowest Accuracy**: Tic-Tac-Toe → due to complexity of board game states and overlapping decision patterns.

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4. Insights and Discussion

- **Effect of Data Size**: Larger datasets like Nursery give high weighted accuracy but may overfit.
- **Effect of Features**: Highly discriminative features (Mushroom) allow shallow trees with perfect accuracy.
- **Effect of Class Imbalance**: Nursery dataset shows imbalance reduces macro precision/recall.
- **Overfitting**: Both Tic-Tac-Toe and Nursery datasets show deeper and larger trees, which may not generalize well.

Decision Trees:

1) Mushrooms Dataset:

🎄 DECISION TREE STRUCTURE

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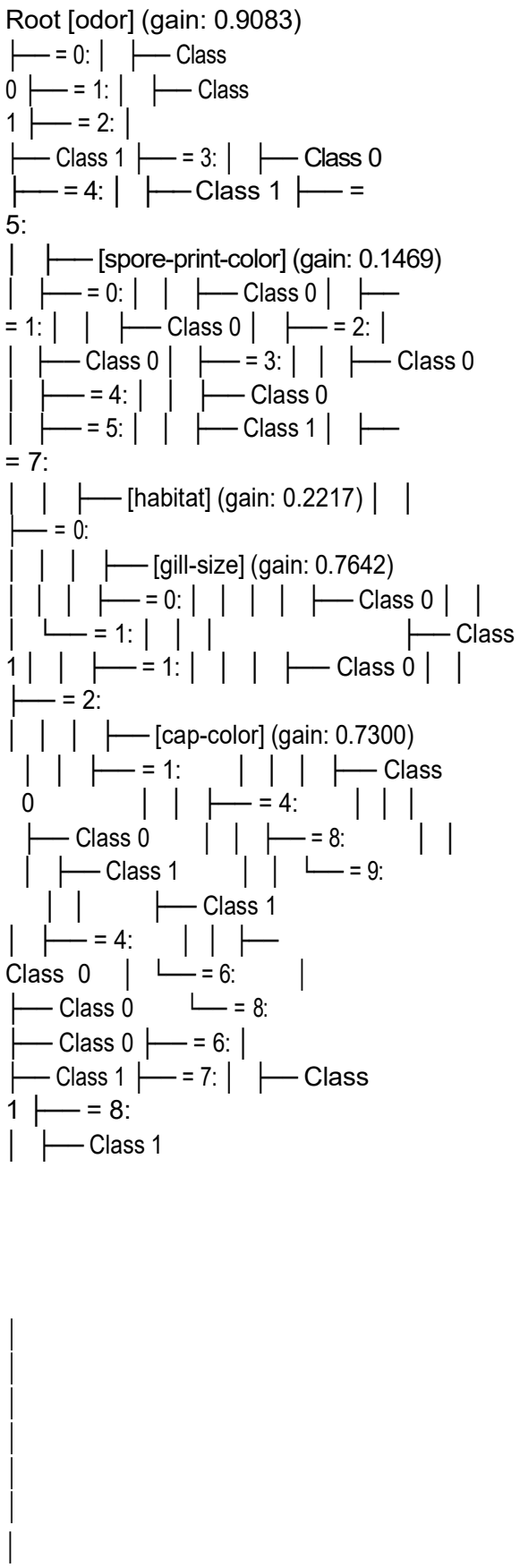
Root [odor] (gain: 0.9083)
├── = 0: │ ├── Class
0 ├── = 1: │ ├── Class
1 ├── = 2: │
├── Class 1 ├── = 3: │ ├── Class 0
├── = 4: │ ├── Class 1 ├── =
5:
│ ├── [spore-print-color] (gain: 0.1469)
│ ├── = 0: │ │ ├── Class 0 │ ├──
= 1: │ │ ├── Class 0 │ ├── = 2: │
│ ├── Class 0 │ ├── = 3: │ │ ├── Class 0
│ ├── = 4: │ │ ├── Class 0
│ ├── = 5: │ │ ├── Class 1 │ ├──
= 7:
│ │ ├── [habitat] (gain: 0.2217) │ │
├── = 0:
│ │ │ ├── [gill-size] (gain: 0.7642)
│ │ │ ├── = 0: │ │ │ │ ├── Class 0 │ │
│ └── = 1: │ │ │ ├── Class
1 │ │ ├── = 1: │ │ │ ├── Class 0 │ │
├── = 2:
│ │ │ ├── [cap-color] (gain: 0.7300)
│ │ ├── = 1: │ │ │ ├── Class
0 │ │ ├── = 4: │ │ │
├── Class 0 │ │ ├── = 8: │ │
│ ├── Class 1 │ │ └── = 9:
│ │ ├── Class 1
│ ├── = 4: │ │ ├──
Class 0 │ └── = 6: │
├── Class 0 └── = 8:
├── Class 0 ├── = 6: │
├── Class 1 ├── = 7: │ ├── Class
1 ├── = 8:
│ ├── Class 1

│ │ ├──
│
│
│
│
│
│
2) Tictactoe Dataset:

🌲 DECISION TREE STRUCTURE

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=

Root [middle-middle-square] (gain: 0.0834) ├── = 0:

│ ├── [bottom-left-square] (gain: 0.1056) │ ├──

= 0:

│ │ ├── [top-right-square] (gain: 0.9024)

│ │ ├── = 1: │ │ │ ├── Class 0 │ │

└── = 2: │ │ ├── Class 1 │ ├── = 1:

│ │ ├── [top-right-square] (gain: 0.2782)

│ │ ├── = 0: │ │ │ ├── Class 0 │ │

├── = 1: │ │ │ ├── Class 0 │ │ └──

= 2:

│ │ ├── [top-left-square] (gain: 0.1767) │ │

├── = 0:

│ │ │ ├── [bottom-right-square] (gain: 0.9183)

│ │ ├── = 1: │ │ ├── Class 0 │

│ └── = 2: │ │ ├── Class 1 │ ├──

= 1:

│ ├── [top-middle-square] (gain:

0.6058) │ ├── 0:

│ │ [middle-left-square] (gain: 0.9183) │

│ │ ├── = 1: │ │ │ ├── Class 0 │ │

│ └── = 2: │ │ │ ├── Class 1 │ │

├── = 1: │ │ │ ├── Class 1 │ │ │ └──

= 2: │ │ │ ├── Class 0 │ │ └── = 2: │

│

│

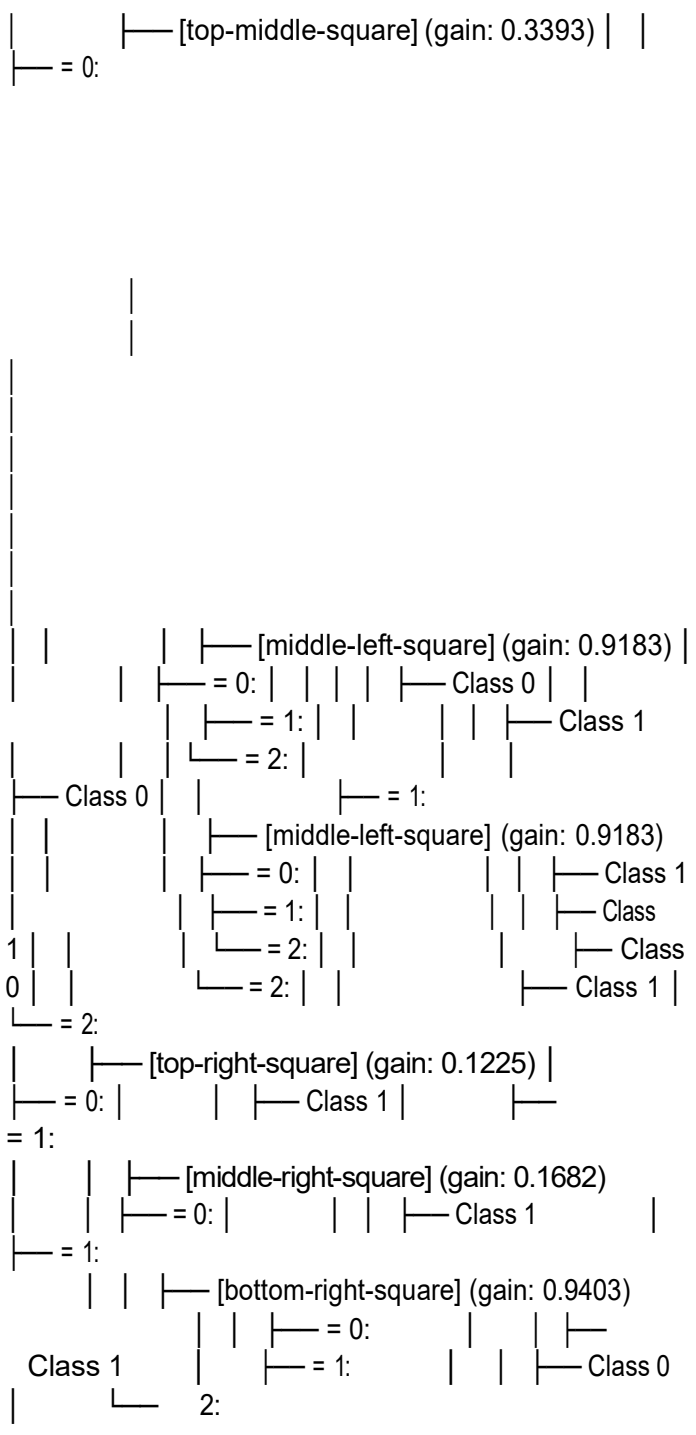
│

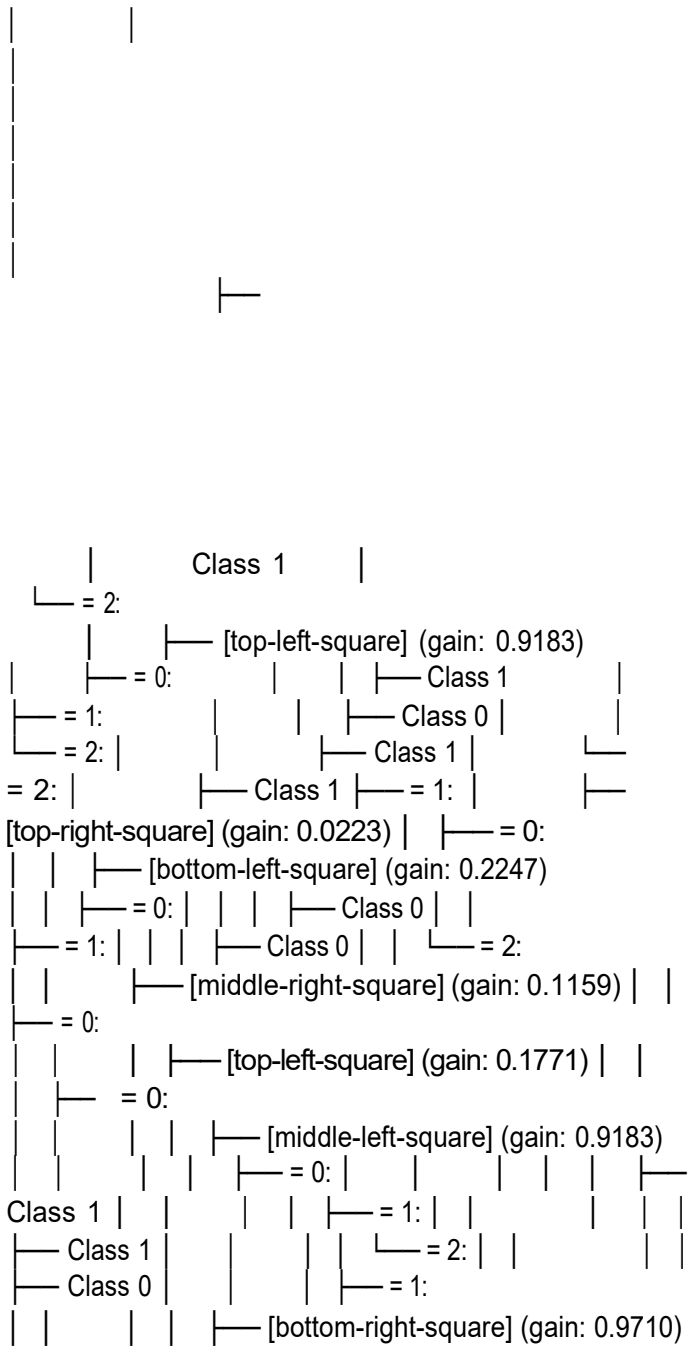
│

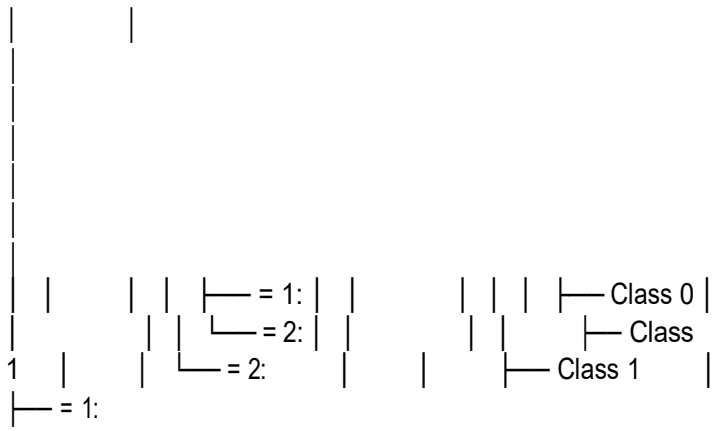
│

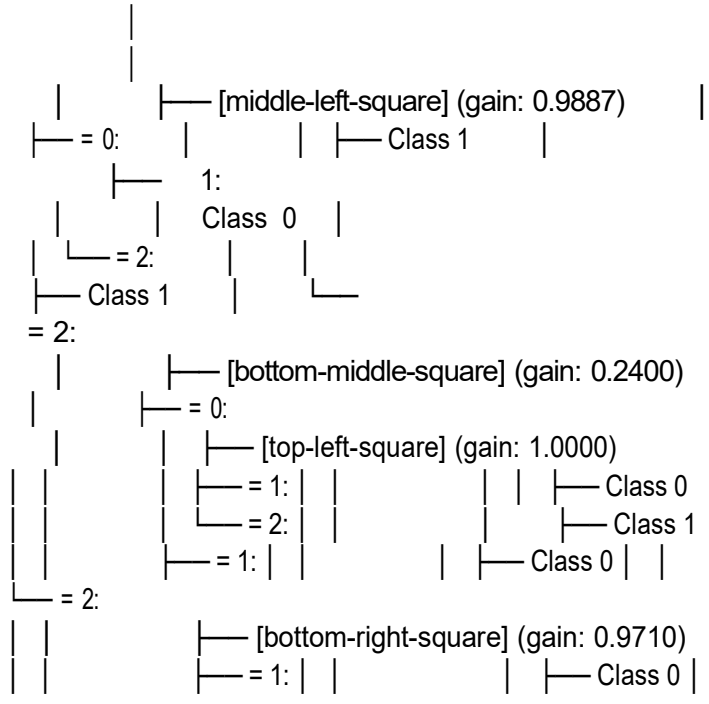
│ │

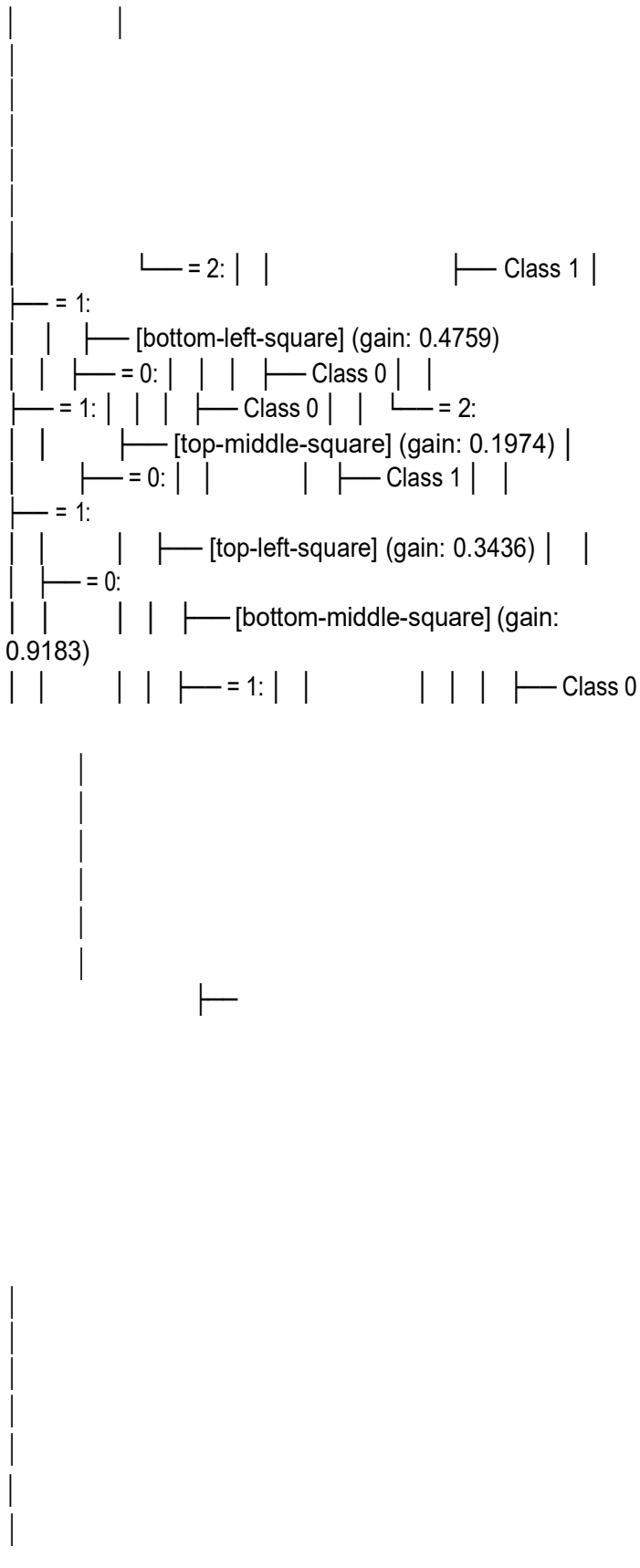
│ │ =

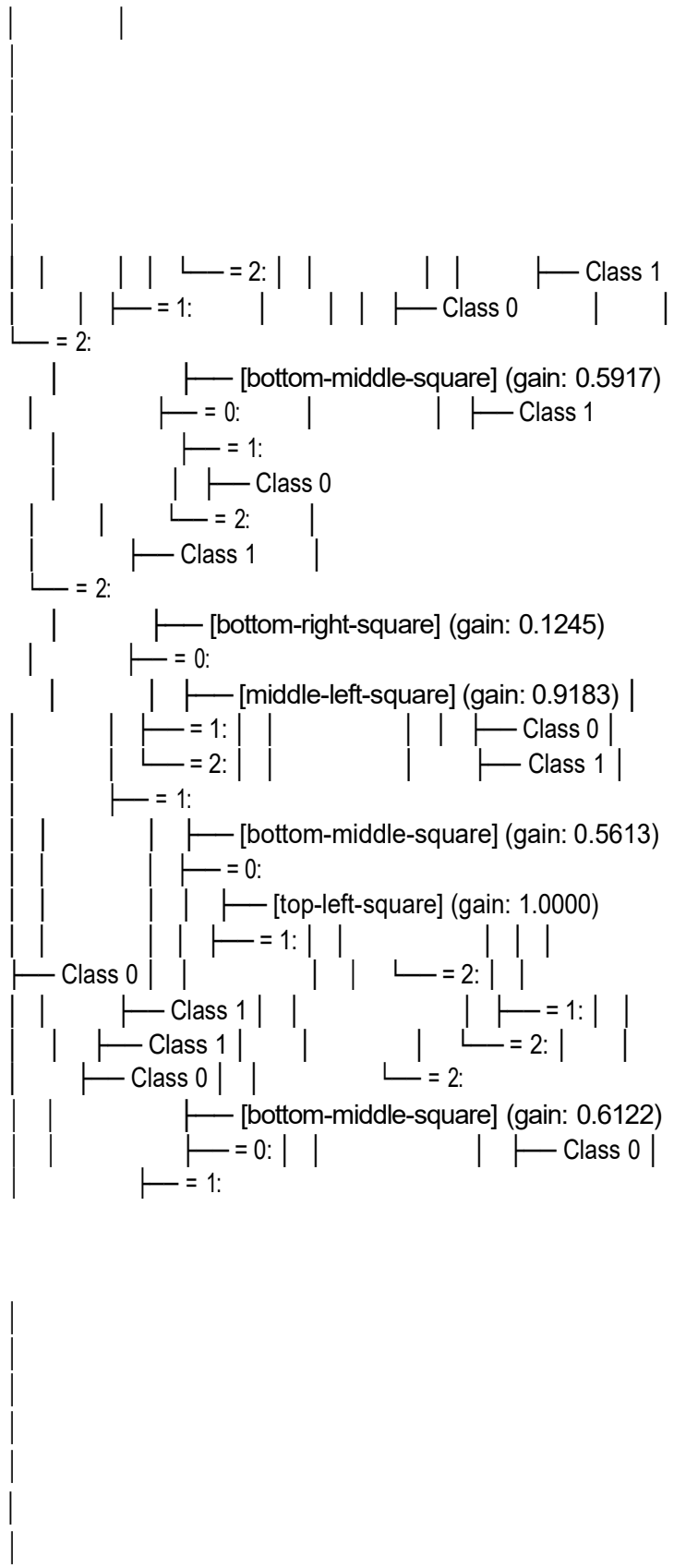

[top-middle-square] (gain: 0.3393)
= 0:
[middle-left-square] (gain: 0.9183)
= 0:
Class 0
= 1:
Class 1
= 2:
Class 0
[middle-left-square] (gain: 0.9183)
= 0:
Class 1
= 1:
Class
= 2:
Class
Class 1
= 2:
[top-right-square] (gain: 0.1225)
= 0:
Class 1
= 1:
[middle-right-square] (gain: 0.1682)
= 0:
Class 1
= 1:
[bottom-right-square] (gain: 0.9403)
= 0:
= 1:
Class 0
Class 1
= 2:
=

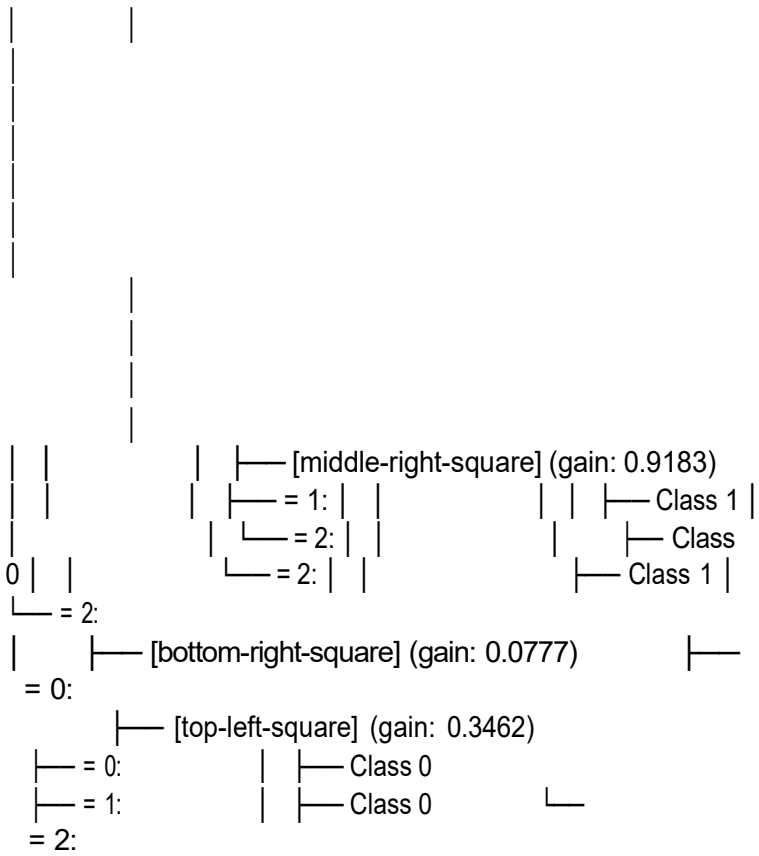

Class 1
= 2:
[top-left-square] (gain: 0.9183)
= 0:
Class 1
= 1:
Class 0
= 2:
Class 1
= 2:
Class 1
= 1:
[top-right-square] (gain: 0.0223)
= 0:
[bottom-left-square] (gain: 0.2247)
= 0:
Class 0
= 1:
Class 0
= 2:
[middle-right-square] (gain: 0.1159)
= 0:
[top-left-square] (gain: 0.1771)
= 0:
[middle-left-square] (gain: 0.9183)
= 0:
= 1:
Class 1
Class 1
Class 0
= 1:
[bottom-right-square] (gain: 0.9710)

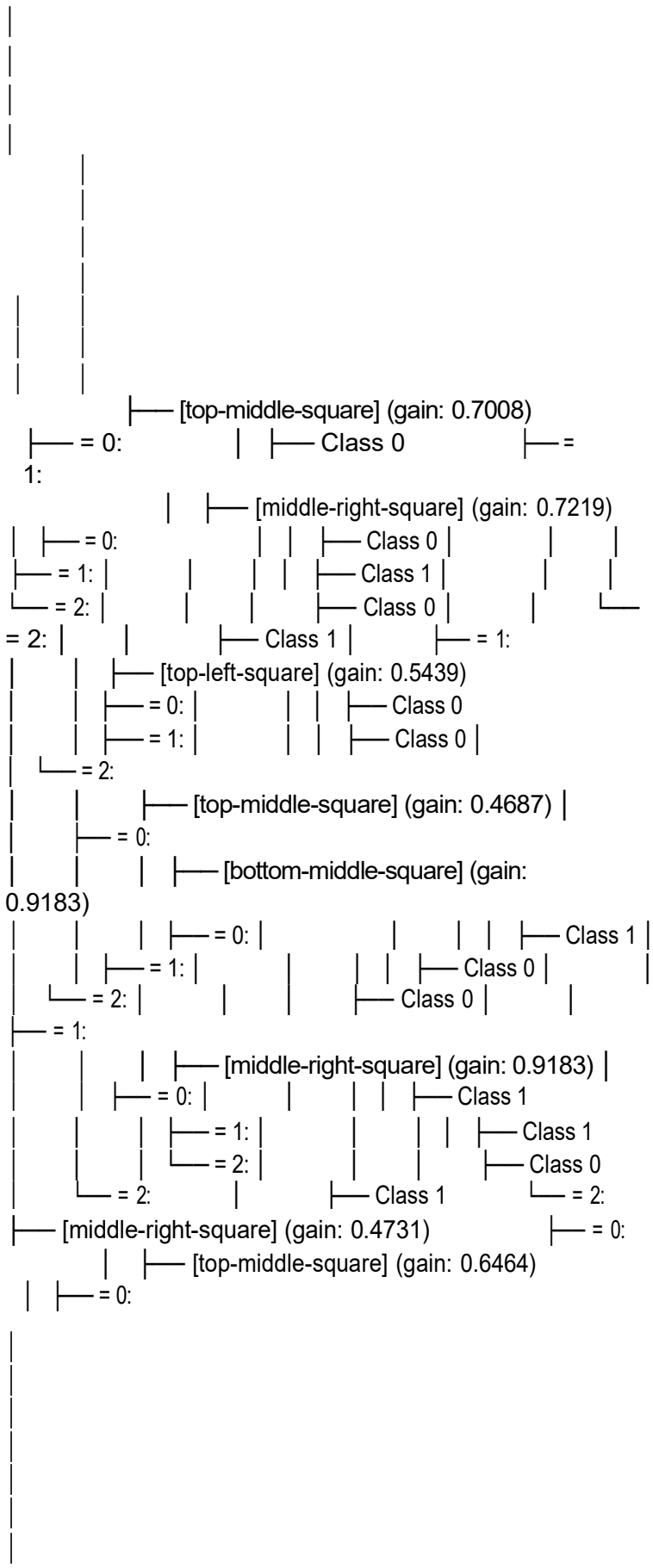

├── = 1:
└── = 2:
├── Class 0
└── Class 1

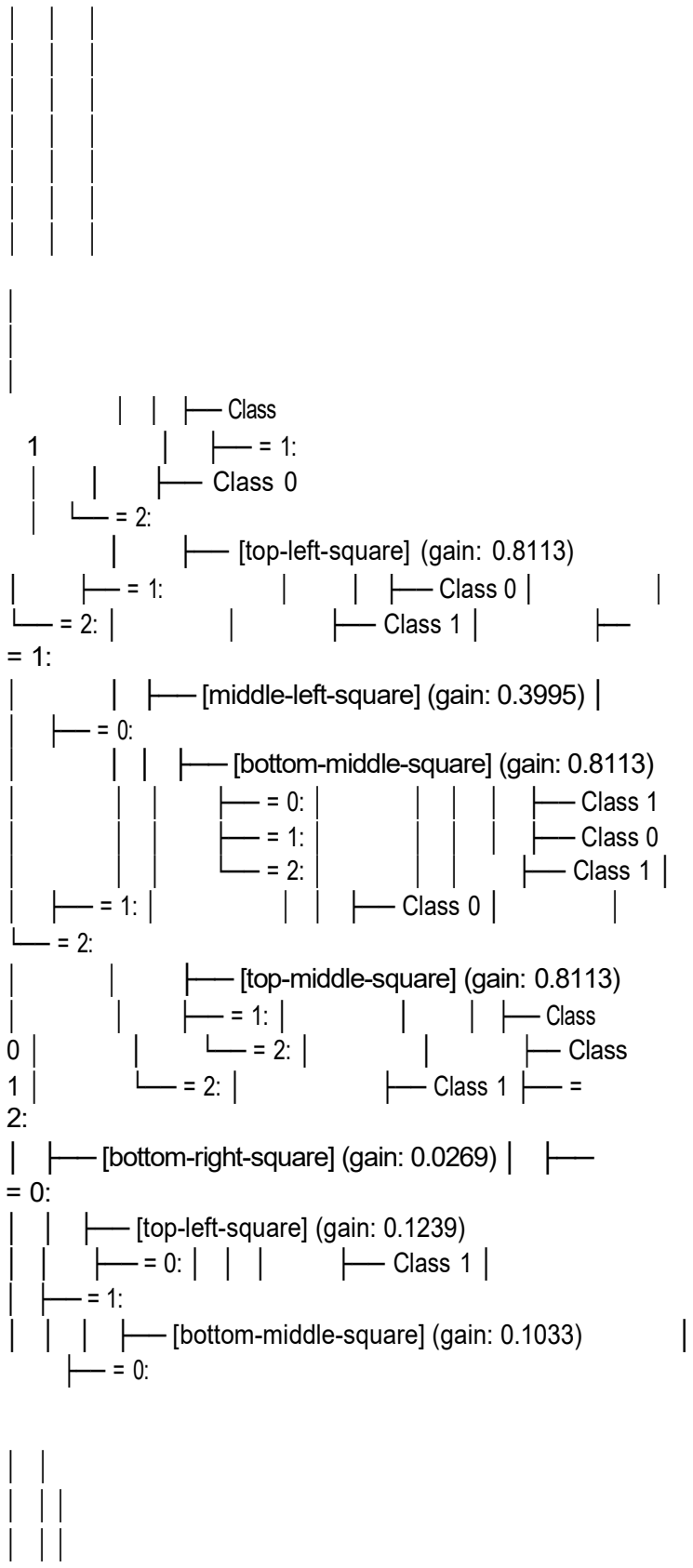

├── [middle-left-square] (gain: 0.9887)
├── = 0:
├── Class 1
└── = 1:
Class 0
└── = 2:
├── Class 1
└──
= 2:
├── [bottom-middle-square] (gain: 0.2400)
├── = 0:
├── [top-left-square] (gain: 1.0000)
├── = 1:
├── Class 0
└── = 2:
├── Class 1
├── = 1:
├── Class 0
└── = 2:
├── [bottom-right-square] (gain: 0.9710)
├── = 1:
├── Class 0

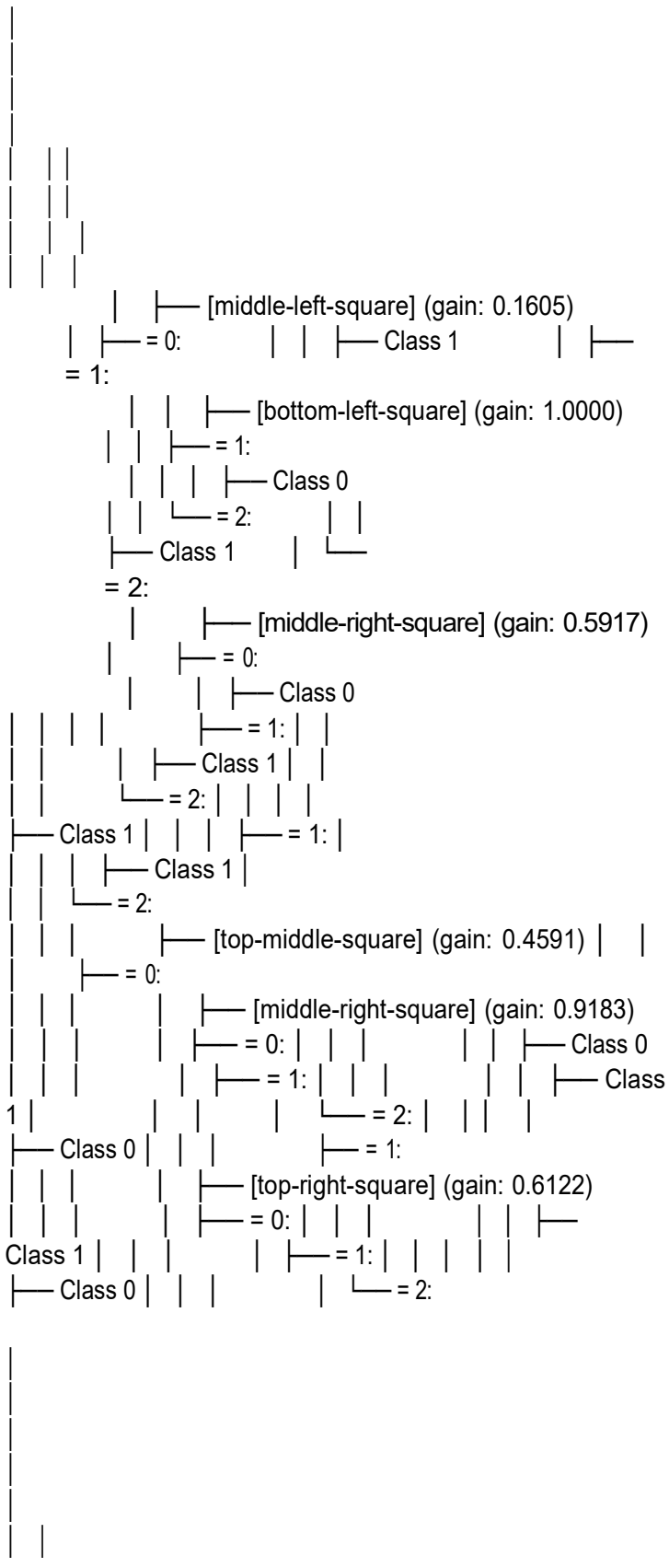

└── = 2: ├── Class 1
├── = 1:
├── [bottom-left-square] (gain: 0.4759)
├── = 0: ├── Class 0
├── = 1: ├── Class 0 └── = 2:
├── [top-middle-square] (gain: 0.1974)
├── = 0: ├── Class 1
├── = 1:
├── [top-left-square] (gain: 0.3436)
├── = 0:
├── [bottom-middle-square] (gain:
0.9183)
├── = 1: ├── Class 0

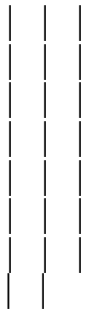

└── = 2:
[bottom-middle-square] (gain: 0.5917)
= 0:
Class 1
= 1:
Class 0
= 2:
Class 1
[bottom-right-square] (gain: 0.1245)
= 0:
[middle-left-square] (gain: 0.9183)
= 1:
Class 0
= 2:
Class 1
= 1:
[bottom-middle-square] (gain: 0.5613)
= 0:
[top-left-square] (gain: 1.0000)
= 1:
Class 0
= 2:
Class 1
= 1:
Class 1
= 2:
Class 0
= 2:
[bottom-middle-square] (gain: 0.6122)
= 0:
Class 0
= 1:

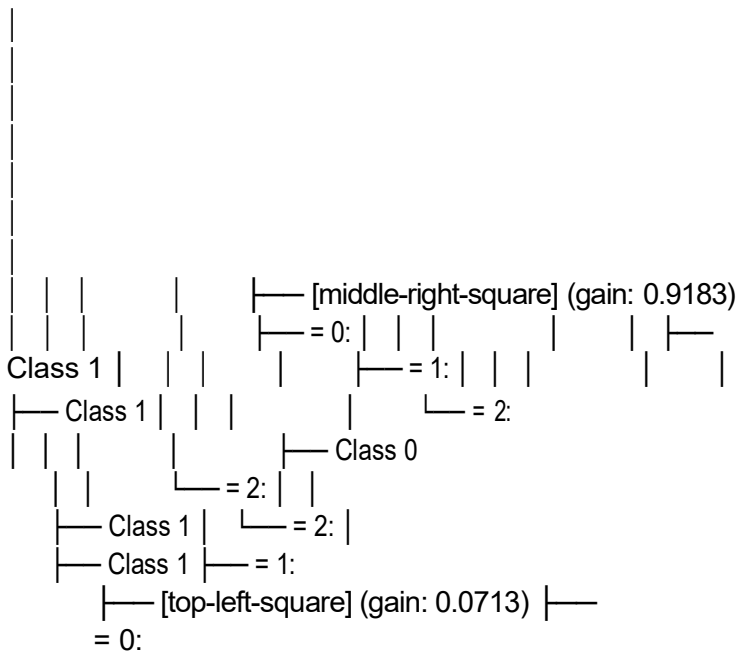

[middle-right-square] (gain: 0.9183)
= 1:
= 2:
Class 1
Class
0
= 2:
= 2:
Class 1
= 2:
[bottom-right-square] (gain: 0.0777)
= 0:
[top-left-square] (gain: 0.3462)
= 0:
= 1:
Class 0
Class 0
= 2:

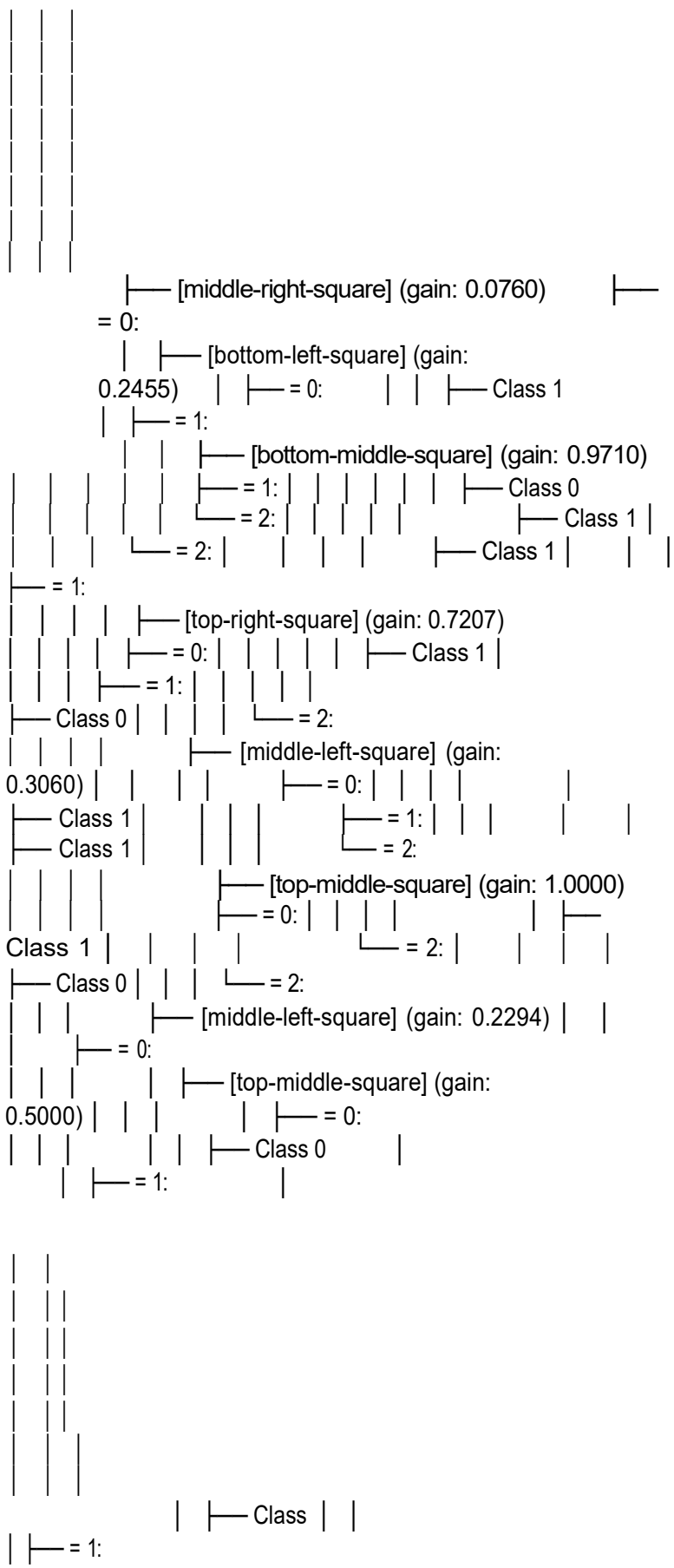

├── [top-middle-square] (gain: 0.7008)
├── = 0: │ ├── Class 0 ├── =
1:
│ ├── [middle-right-square] (gain: 0.7219)
│ ├── = 0: │ │ ├── Class 0 │ │ │
├── = 1: │ │ │ │ ├── Class 1 │ │ │
└── = 2: │ │ │ ├── Class 0 │ │ └──
= 2: │ │ ├── Class 1 │ ├── = 1:
│ │ ├── [top-left-square] (gain: 0.5439)
│ │ ├── = 0: │ │ ├── Class 0
│ │ ├── = 1: │ │ ├── Class 0 │
│ └── = 2:
│ │ ├── [top-middle-square] (gain: 0.4687) │
│ ├── = 0:
│ │ │ ├── [bottom-middle-square] (gain:
0.9183)
│ │ │ ├── = 0: │ │ │ ├── Class 1 │
│ │ ├── = 1: │ │ │ ├── Class 0 │ │
│ └── = 2: │ │ ├── Class 0 │ │
├── = 1:
│ │ ├── [middle-right-square] (gain: 0.9183) │
│ ├── = 0: │ │ │ ├── Class 1
│ │ │ ├── = 1: │ │ │ ├── Class 1
│ │ │ └── = 2: │ │ ├── Class 0
│ └── = 2: │ ├── Class 1 └── = 2:
├── [middle-right-square] (gain: 0.4731) ├── = 0:
│ ├── [top-middle-square] (gain: 0.6464)
├── = 0:

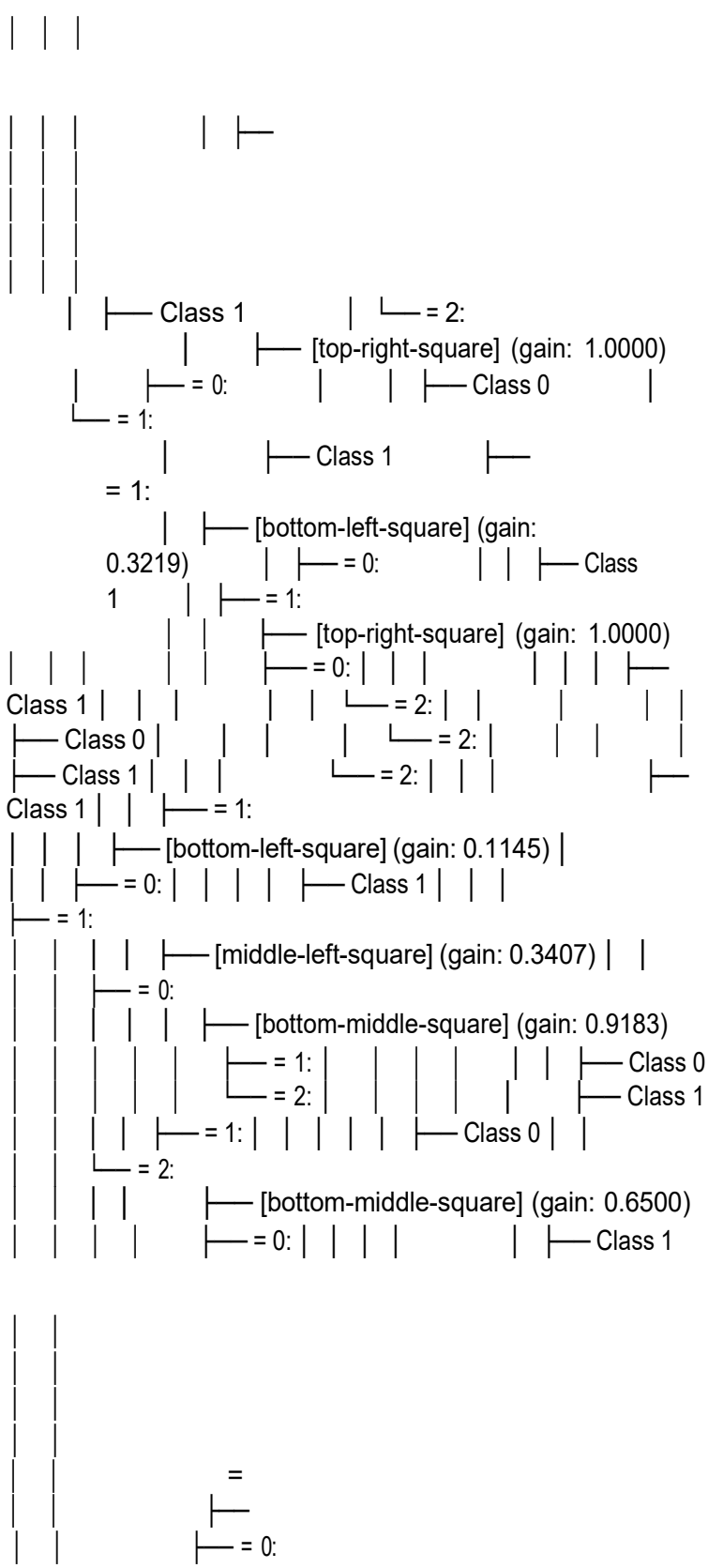

[top-left-square] (gain: 0.8113)
= 1:
Class 0
= 2:
[middle-left-square] (gain: 0.3995)
= 0:
[bottom-middle-square] (gain: 0.8113)
= 0:
Class 1
= 1:
Class 0
= 2:
Class 1
= 1:
Class 0
= 2:
[top-middle-square] (gain: 0.8113)
= 1:
Class 0
= 2:
Class 1
= 2:
[bottom-right-square] (gain: 0.0269)
= 0:
[top-left-square] (gain: 0.1239)
= 0:
Class 1
= 1:
[bottom-middle-square] (gain: 0.1033)
= 0:

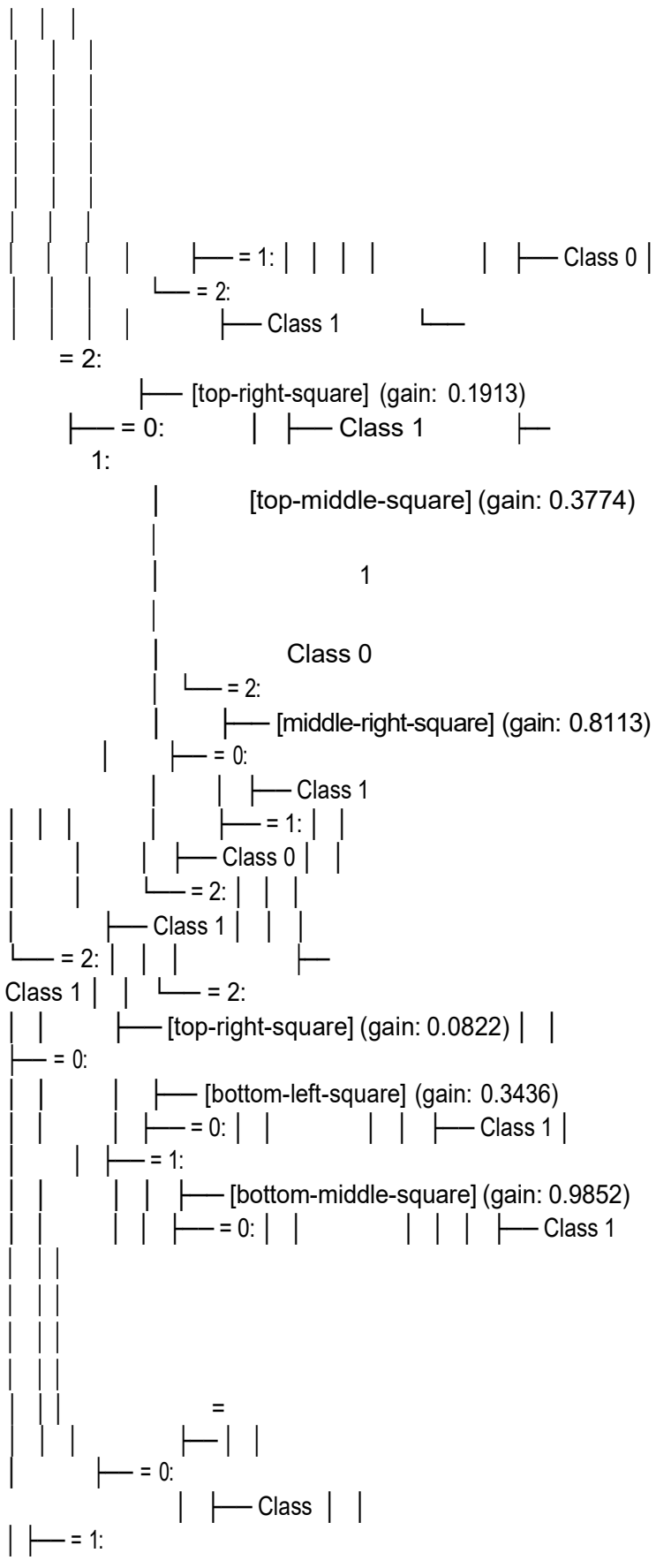

[middle-left-square] (gain: 0.1605)
= 0:
Class 1
= 1:
[bottom-left-square] (gain: 1.0000)
= 1:
Class 0
= 2:
Class 1
= 2:
[middle-right-square] (gain: 0.5917)
= 0:
Class 0
= 1:
Class 1
= 2:
Class 1
= 1:
Class 1
= 2:
[top-middle-square] (gain: 0.4591)
= 0:
[middle-right-square] (gain: 0.9183)
= 0:
Class 0
= 1:
Class 1
= 2:
Class 0
= 1:
[top-right-square] (gain: 0.6122)
= 0:
= 1:
Class 0
= 2:

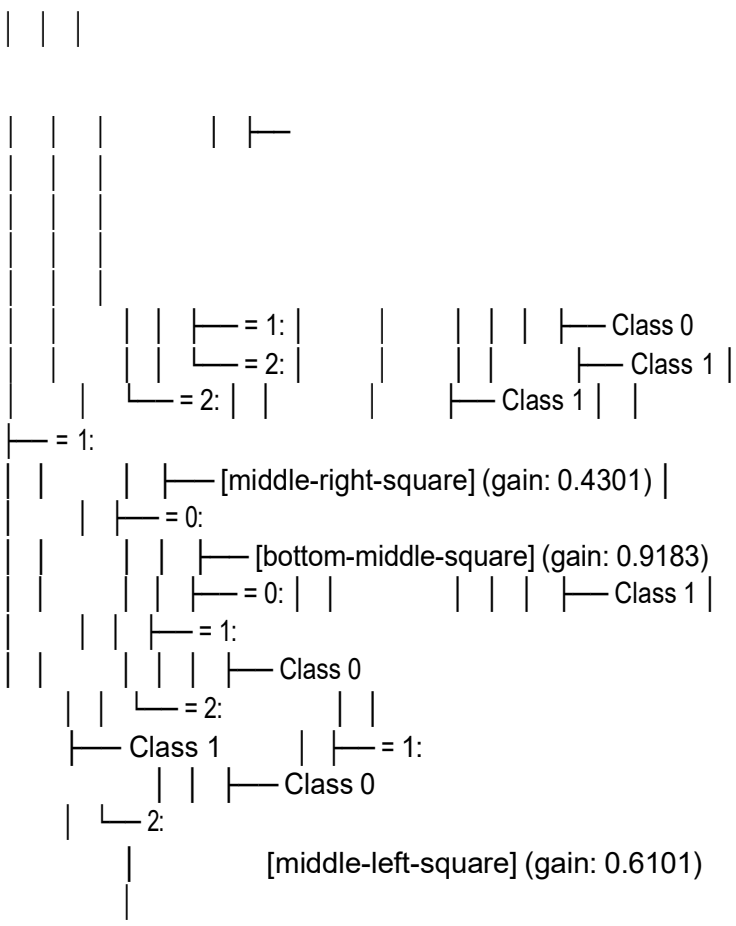


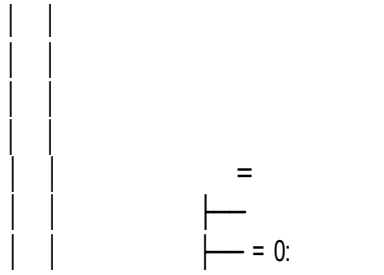

[middle-right-square] (gain: 0.9183)
= 0:
= 1:
= 2:
Class 1
Class 1
Class 0
= 2:
Class 1
= 2:
Class 1
= 1:
[top-left-square] (gain: 0.0713)
= 0:

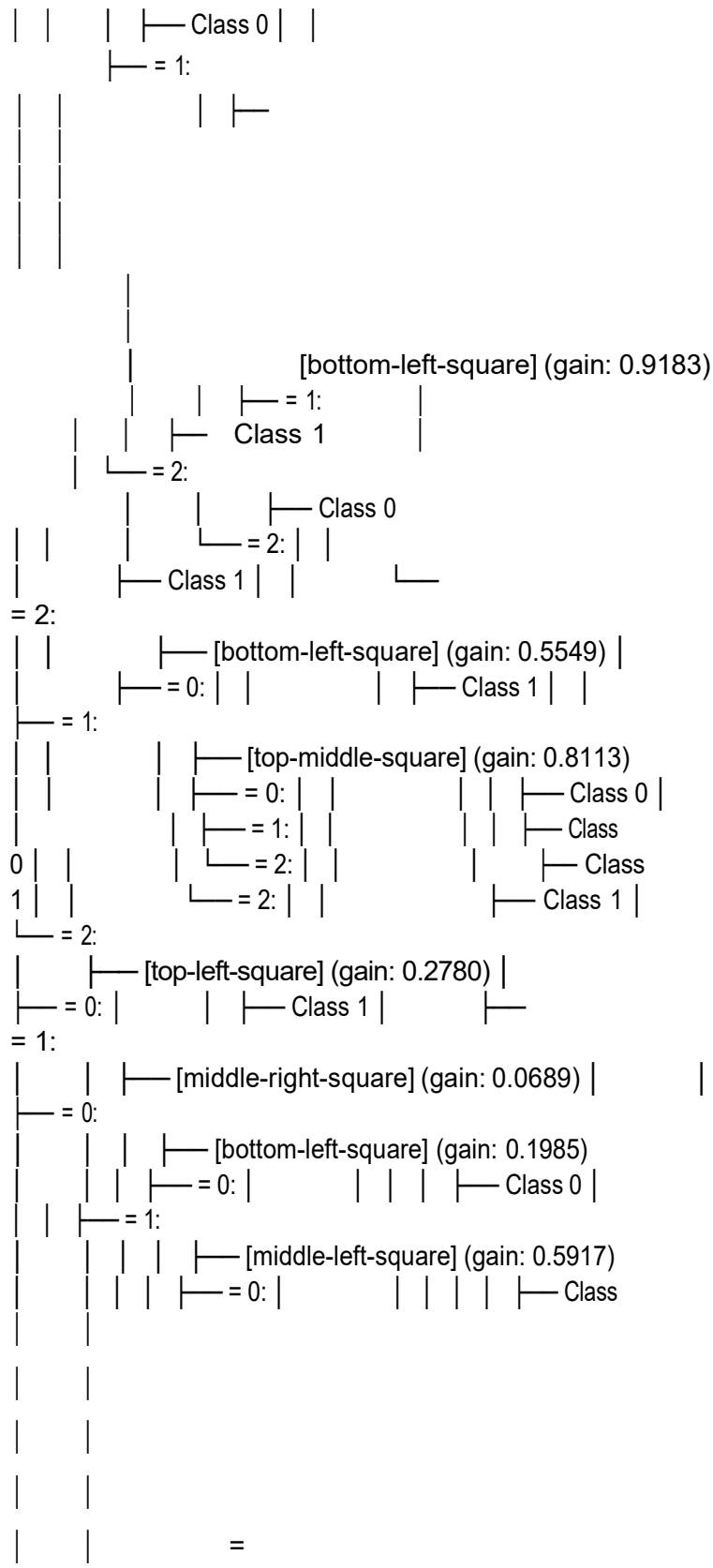

[middle-right-square] (gain: 0.0760)
= 0:
[bottom-left-square] (gain:
0.2455)
= 0:
Class 1
= 1:
[bottom-middle-square] (gain: 0.9710)
= 1:
Class 0
= 2:
Class 1
= 2:
Class 1
= 1:
[top-right-square] (gain: 0.7207)
= 0:
Class 1
= 1:
Class 0
= 2:
[middle-left-square] (gain:
0.3060)
= 0:
Class 1
= 1:
Class 1
= 2:
[top-middle-square] (gain: 1.0000)
= 0:
Class 1
= 2:
Class 0
= 2:
[middle-left-square] (gain: 0.2294)
= 0:
[top-middle-square] (gain:
0.5000)
= 0:
Class 0
= 1:
Class
= 1:

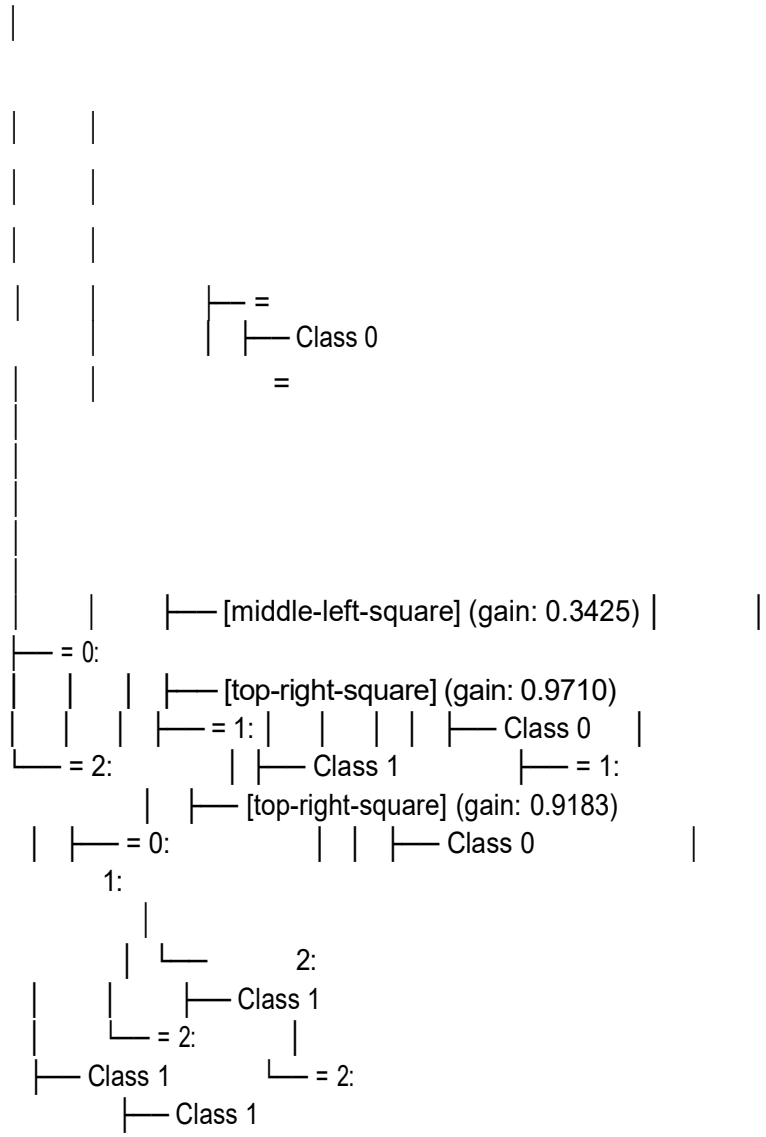

Class 1
= 2:
[top-right-square] (gain: 1.0000)
= 0:
Class 0
= 1:
Class 1
= 1:
[bottom-left-square] (gain:
0.3219)
= 0:
Class
1
= 1:
[top-right-square] (gain: 1.0000)
= 0:
= 2:
Class 1
Class 0
Class 1
= 2:
Class 1
= 1:
[bottom-left-square] (gain: 0.1145)
= 0:
Class 1
= 1:
[middle-left-square] (gain: 0.3407)
= 0:
[bottom-middle-square] (gain: 0.9183)
= 1:
Class 0
= 2:
Class 1
= 1:
Class 0
= 2:
[bottom-middle-square] (gain: 0.6500)
= 0:
Class 1
=
= 0:


= 1:
Class 0
= 2:
Class 1
= 2:
[top-right-square] (gain: 0.1913)
= 0:
Class 1
1:
[top-middle-square] (gain: 0.3774)
1
Class 0
= 2:
[middle-right-square] (gain: 0.8113)
= 0:
Class 1
= 1:
Class 0
= 2:
Class 1
= 2:
Class 1
= 2:
[top-right-square] (gain: 0.0822)
= 0:
[bottom-left-square] (gain: 0.3436)
= 0:
Class 1
= 1:
[bottom-middle-square] (gain: 0.9852)
= 0:
Class 1
=
= 0:
Class
= 1:


= 1:
Class 0
= 2:
Class 1
= 2:
Class 1
= 1:
[middle-right-square] (gain: 0.4301)
= 0:
[bottom-middle-square] (gain: 0.9183)
= 0:
Class 1
= 1:
Class 0
= 2:
Class 1
= 1:
Class 0
2:
[middle-left-square] (gain: 0.6101)


=
= 0:


Class 0
= 1:
[bottom-left-square] (gain: 0.9183)
= 1:
Class 1
= 2:
Class 0
= 2:
Class 1
= 2:
[bottom-left-square] (gain: 0.5549)
= 0:
Class 1
= 1:
[top-middle-square] (gain: 0.8113)
= 0:
Class 0
= 1:
Class
= 2:
Class
Class 1
= 2:
[top-left-square] (gain: 0.2780)
= 0:
Class 1
= 1:
[middle-right-square] (gain: 0.0689)
= 0:
[bottom-left-square] (gain: 0.1985)
= 0:
Class 0
= 1:
[middle-left-square] (gain: 0.5917)
= 0:
Class
=



3) Nursery Dataset:

🌲 DECISION TREE STRUCTURE

==========

=

Root [health] (gain: 0.9595)

├── = 0: ├── Class 0 ├──

= 1:

├── [has_nurs] (gain: 0.3555) ├──

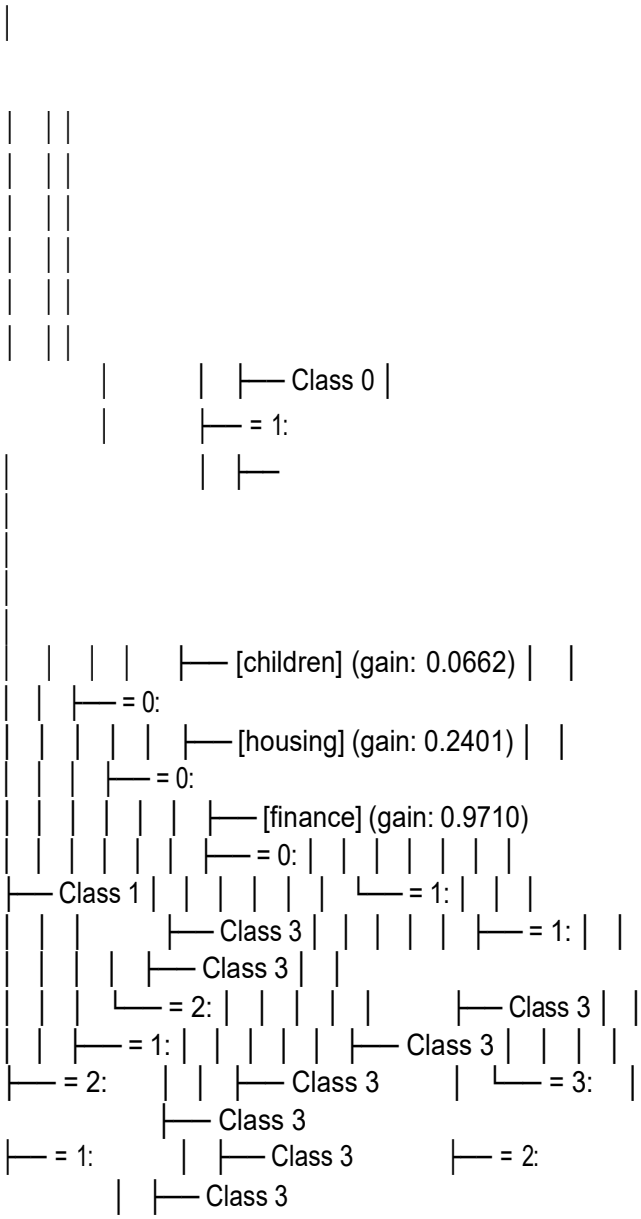
= 0:

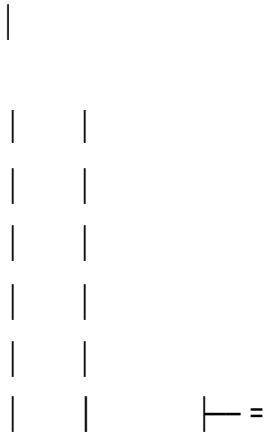
├── [parents] (gain: 0.1673) ├──

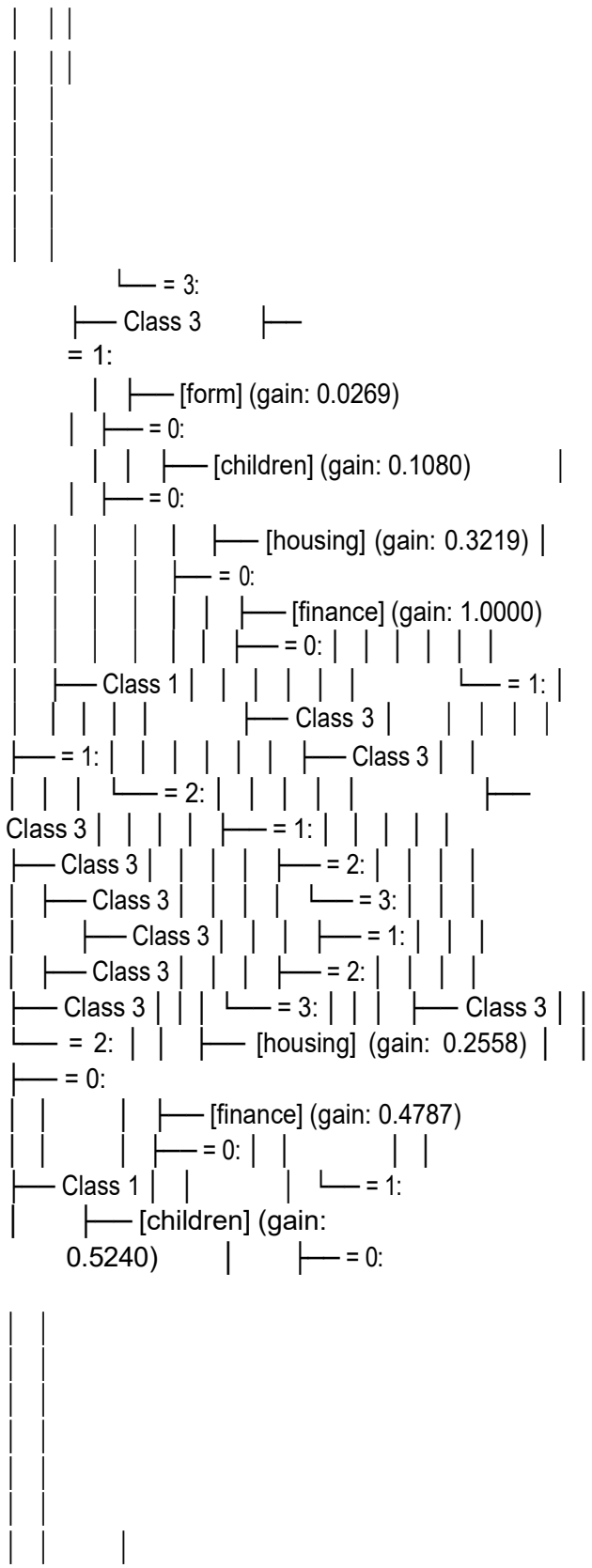
= 0:

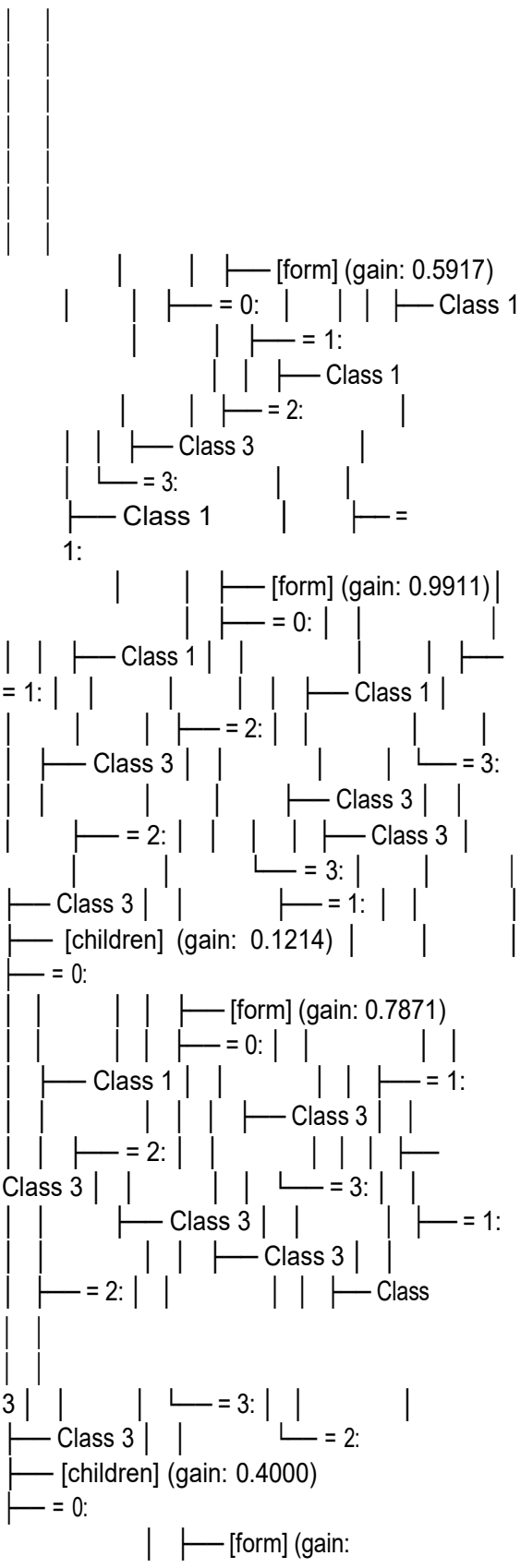
├── [form] (gain: 0.0171) ├──

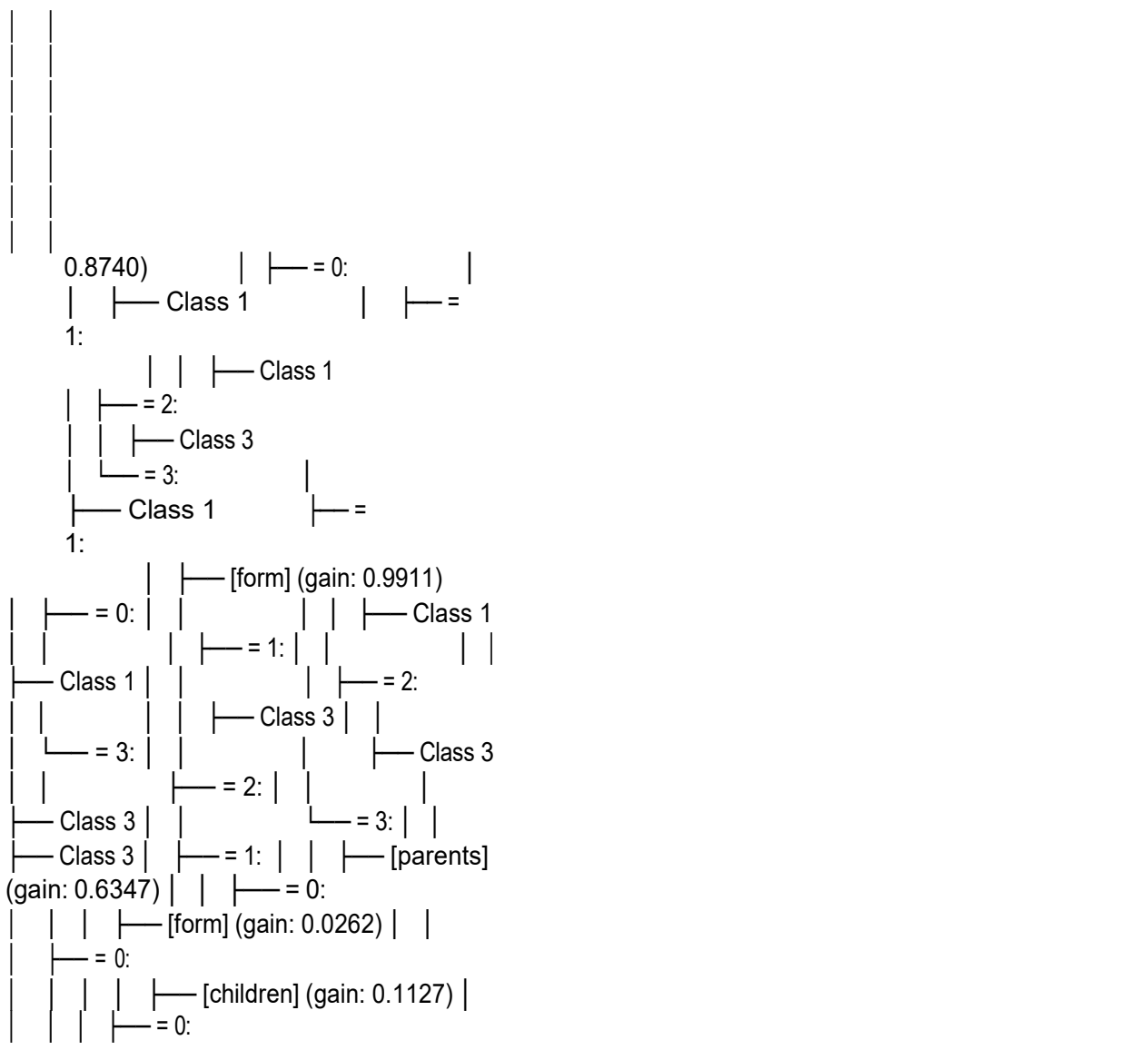
├── = 0:

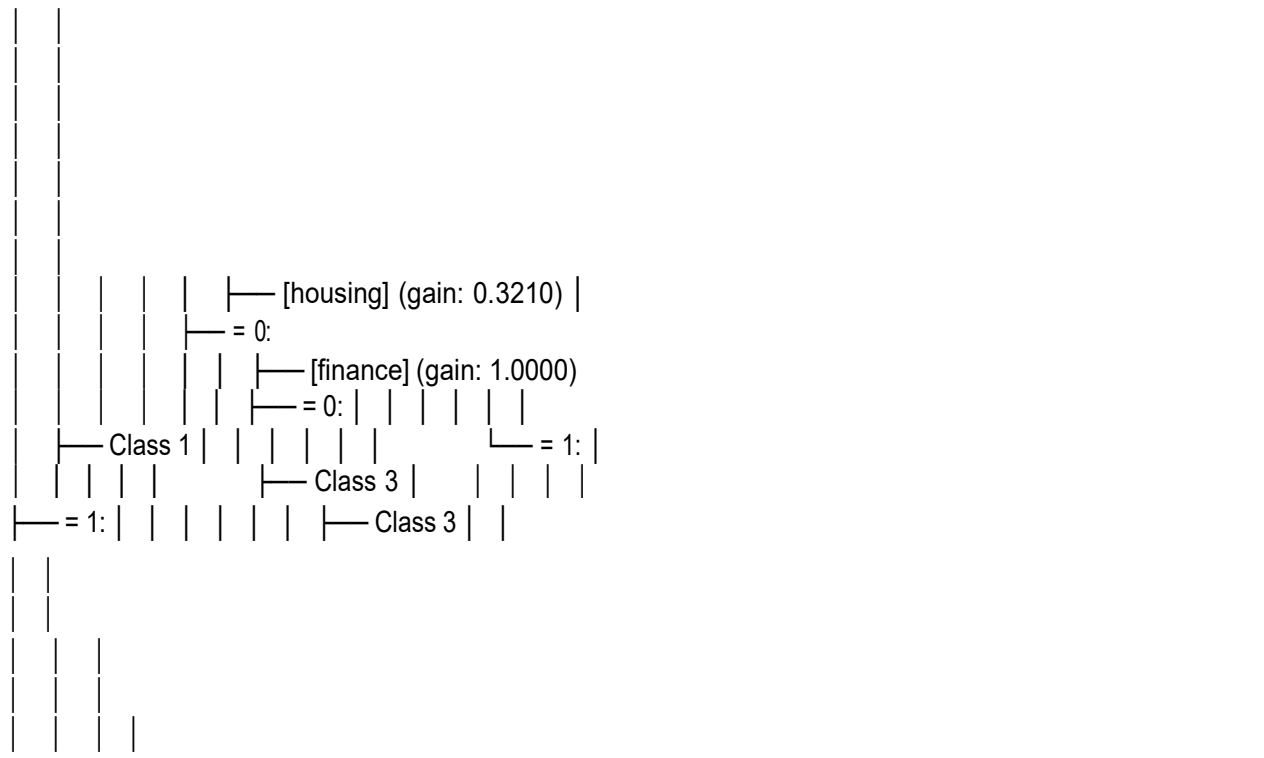

├── Class 0
├── = 1:
├──
├── [children] (gain: 0.0662)
├── = 0:
├── [housing] (gain: 0.2401)
├── = 0:
├── [finance] (gain: 0.9710)
├── = 0:
└── = 1:
├── Class 1
├── Class 3
├── = 1:
├── Class 3
├── Class 3
└── = 2:
├── Class 3
├── = 1:
├── Class 3
├── Class 3
└── = 3:
├── = 2:
├── Class 3
├── Class 3
├── = 2:
├── = 1:
├── Class 3
├── Class 3

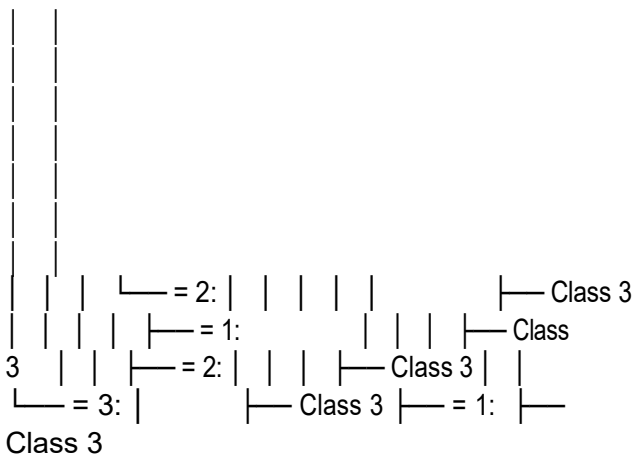


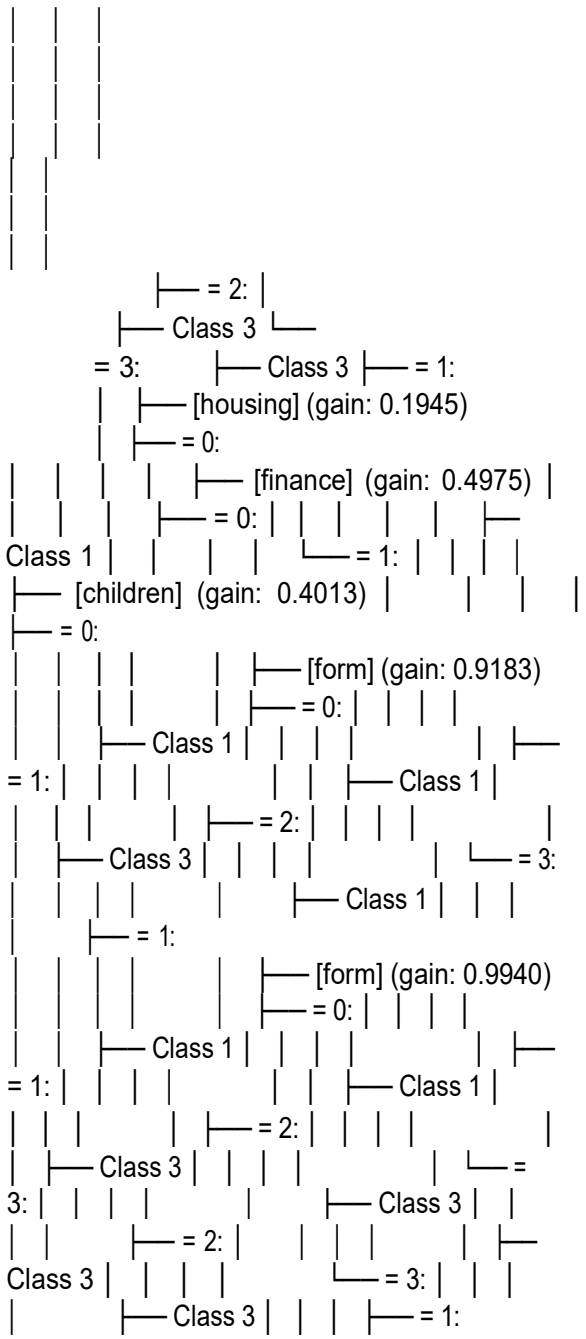

└── = 3:
├── Class 3 ├──
= 1:
├── [form] (gain: 0.0269)
├── = 0:
├── [children] (gain: 0.1080)
├── = 0:
├── [housing] (gain: 0.3219)
├── = 0:
├── [finance] (gain: 1.0000)
├── = 0:
├── Class 1
└── = 1:
├── Class 3
├── = 1:
├── Class 3
└── = 2:
Class 3
├── = 1:
├── Class 3
├── = 2:
├── Class 3
└── = 3:
├── Class 3
├── = 1:
├── Class 3
├── = 2:
├── Class 3
└── = 3:
├── Class 3
└── = 2:
├── [housing] (gain: 0.2558)
├── = 0:
├── [finance] (gain: 0.4787)
├── = 0:
├── Class 1
└── = 1:
├── [children] (gain:
0.5240)
├── = 0:

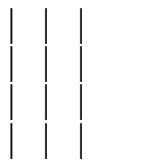

├── [form] (gain: 0.5917)
├── = 0:
├── Class 1
├── = 1:
├── Class 1
├── = 2:
├── Class 3
└── = 3:
├── Class 1
├── =
1:
├── [form] (gain: 0.9911)
├── = 0:
├── Class 1
├── = 1:
├── Class 1
├── = 2:
├── Class 3
└── = 3:
├── Class 3
├── = 2:
└── = 3:
├── Class 3
├── = 1:
├── [children] (gain: 0.1214)
├── = 0:
├── [form] (gain: 0.7871)
├── = 0:
├── Class 1
├── = 1:
├── Class 3
├── = 2:
├── Class 3
└── = 3:
├── Class 3
├── = 1:
├── Class 3
├── = 2:
├── Class
3
└── = 3:
├── Class 3
└── = 2:
├── [children] (gain: 0.4000)
├── = 0:
├── [form] (gain:

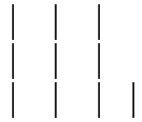

0.8740)
= 0:
Class 1
=
1:
Class 1
= 2:
Class 3
= 3:
Class 1
=
1:
[form] (gain: 0.9911)
= 0:
Class 1
= 1:
Class 1
= 2:
Class 3
= 3:
Class 3
= 2:
Class 3
= 3:
Class 3
= 1:
[parents]
(gain: 0.6347)
= 0:
[form] (gain: 0.0262)
= 0:
[children] (gain: 0.1127)
= 0:

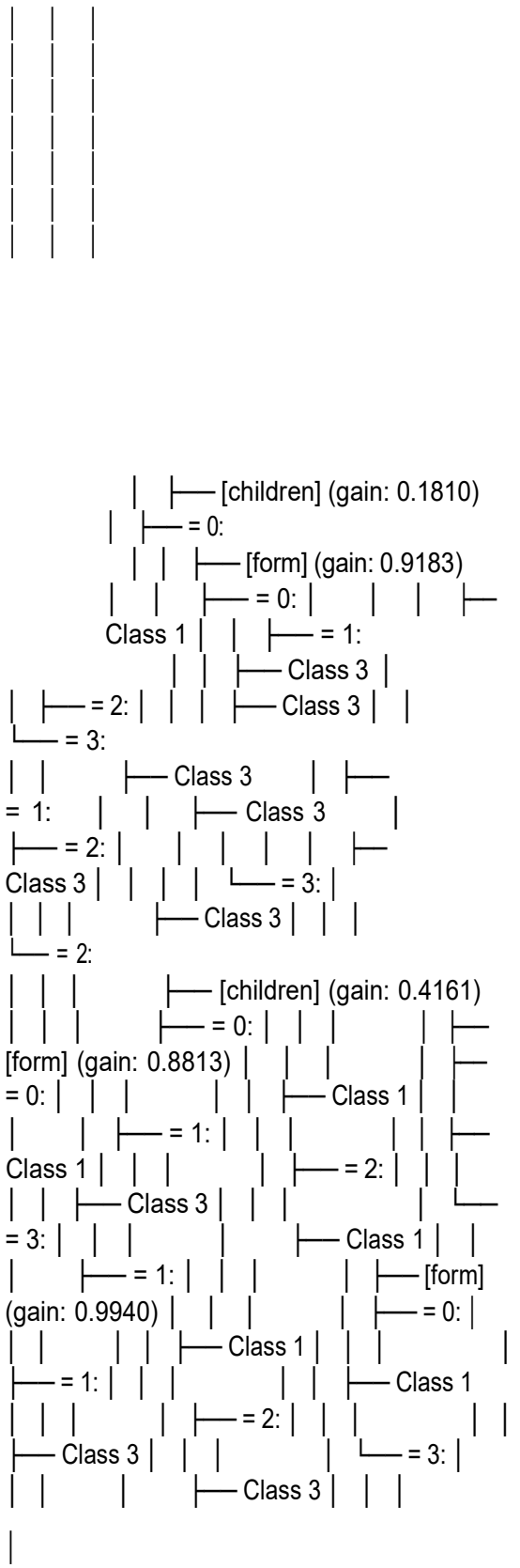

[housing] (gain: 0.3210)
= 0:
[finance] (gain: 1.0000)
= 0:
= 1:
Class 1
Class 3
= 1:
Class 3

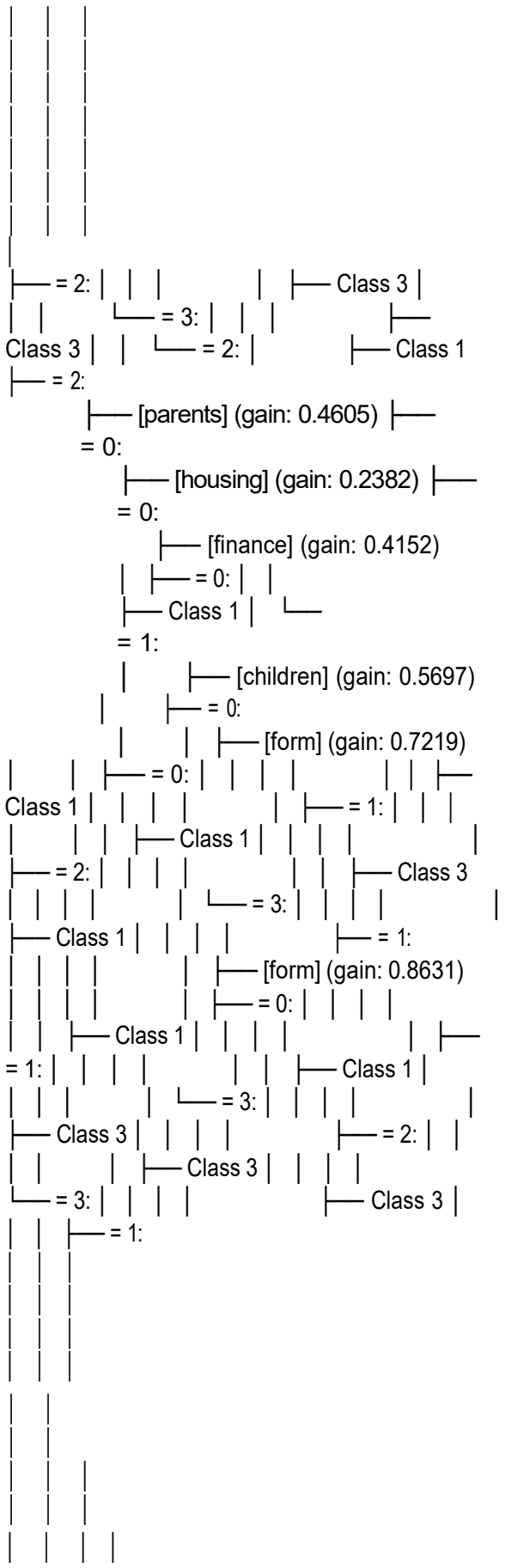

└── = 2:
├── Class 3
├── = 1:
├── Class 3
├── = 2:
├── Class 3
└── = 3:
├── Class 3
├── = 1:
├── Class 3

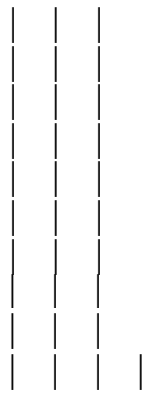

├── = 2: │
├── Class 3 └──
= 3: ├── Class 3 ├── = 1:
├── [housing] (gain: 0.1945)
├── = 0:
├── [finance] (gain: 0.4975) │
├── = 0: │ ├── Class 1 │ └── = 1: │ │ ├──
├── [children] (gain: 0.4013) │ │ │
├── = 0:
├── [form] (gain: 0.9183)
├── = 0: │ │ │
├── Class 1 │ │ │ │ ├──
= 1: │ │ │ │ ├── Class 1 │
├── = 2: │ │ │ │ │
├── Class 3 │ │ │ │ └── = 3:
├── Class 1 │ │ │
├── = 1:
├── [form] (gain: 0.9940)
├── = 0: │ │ │ │
├── Class 1 │ │ │ │ ├──
= 1: │ │ │ │ ├── Class 1 │
├── = 2: │ │ │ │ │
├── Class 3 │ │ │ │ └── =
3: │ │ │ │ ├── Class 3 │ │
├── = 2: │ │ │ │ ├──
Class 3 │ │ │ └── = 3: │ │ │
├── Class 3 │ │ │ ├── = 1:

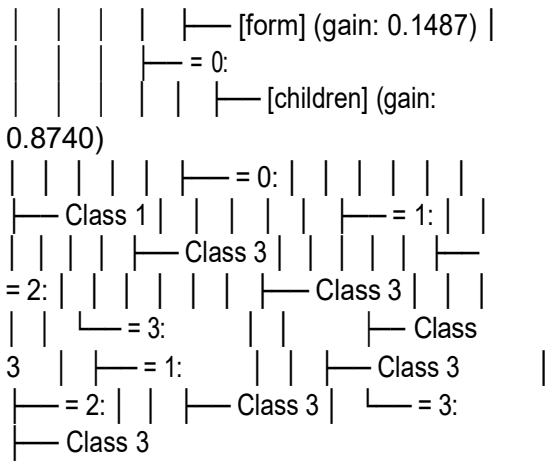


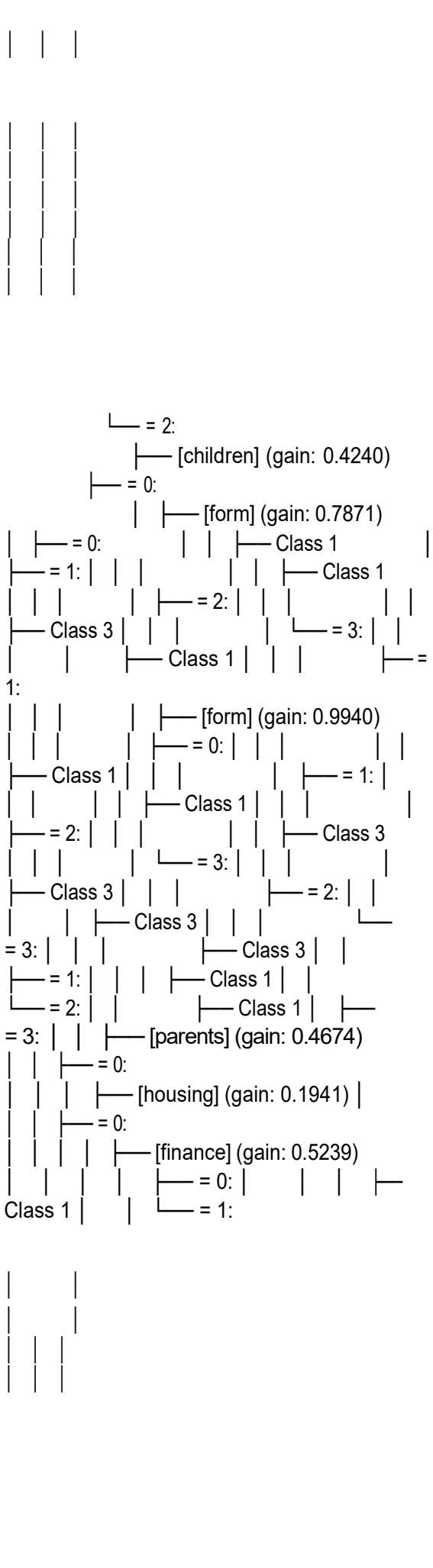


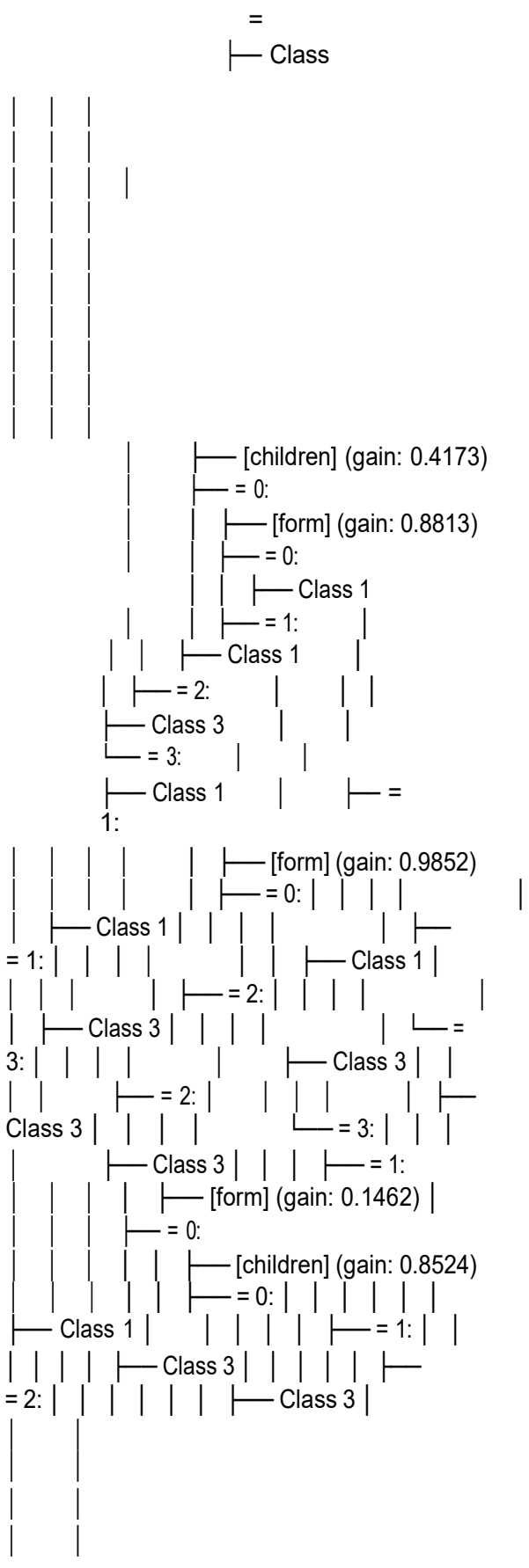


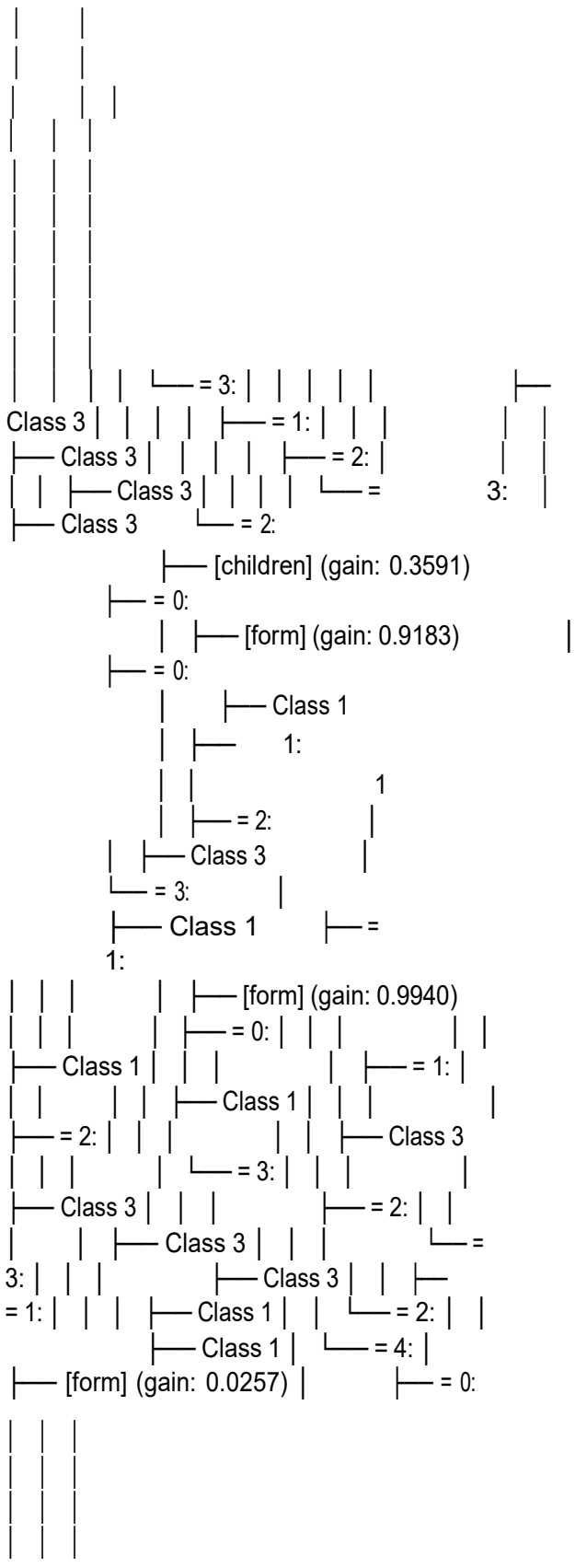

├── = 2: │ │ │ │ ├── Class 3 │
│ │ └── = 3: │ │ │ ├──
Class 3 │ │ └── = 2: │ ├── Class 1
├── = 2:
├── [parents] (gain: 0.4605) ├──
= 0:
├── [housing] (gain: 0.2382) ├──
= 0:
├── [finance] (gain: 0.4152)
│ ├── = 0: │ │
├── Class 1 │ └──
= 1:
│ ├── [children] (gain: 0.5697)
│ ├── = 0:
│ │ ├── [form] (gain: 0.7219)
│ │ ├── = 0: │ │ │ │ │ │ ├──
Class 1 │ │ │ │ ├── = 1: │ │ │
│ │ ├── Class 1 │ │ │ │ │
├── = 2: │ │ │ │ │ ├── Class 3
│ │ │ │ │ └── = 3: │ │ │ │ │
├── Class 1 │ │ │ │ ├── = 1:
│ │ │ │ │ ├── [form] (gain: 0.8631)
│ │ │ │ │ ├── = 0: │ │ │ │
│ │ ├── Class 1 │ │ │ │ │ ├──
= 1: │ │ │ │ │ │ ├── Class 1 │
│ │ │ │ └── = 3: │ │ │ │ │
├── Class 3 │ │ │ │ ├── = 2: │ │
│ │ │ ├── Class 3 │ │ │ │
└── = 3: │ │ │ │ ├── Class 3 │
│ │ ├── = 1:

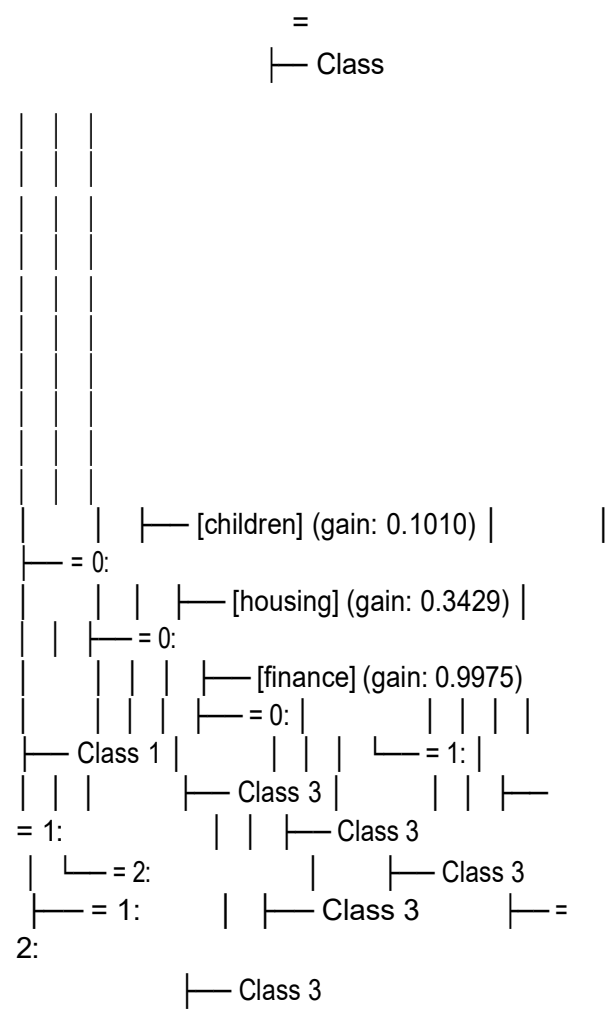


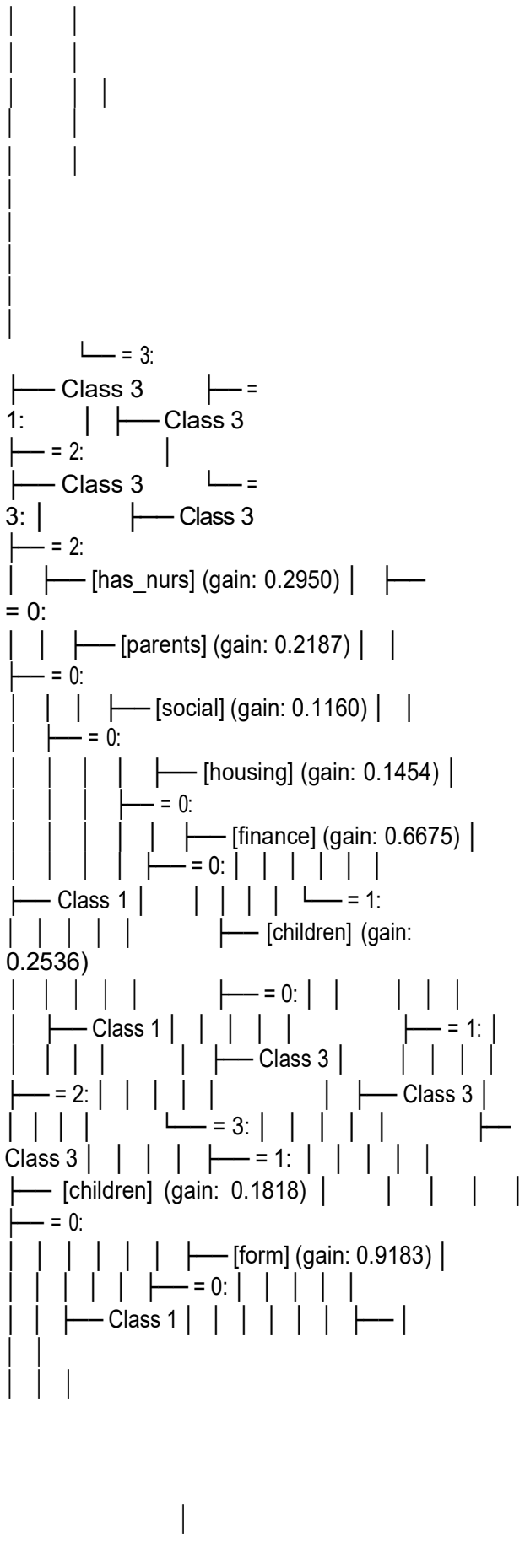

[form] (gain: 0.1487)
= 0:
[children] (gain:
0.8740)
= 0:
Class 1
= 1:
Class 3
= 2:
Class 3
= 3:
Class
3
= 1:
Class 3
= 2:
Class 3
= 3:
Class 3

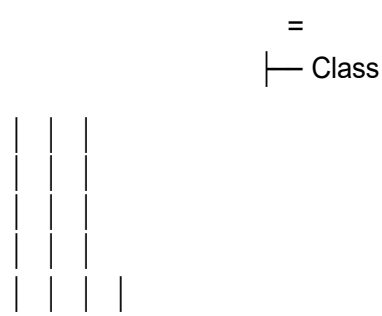

└── = 2:
├── [children] (gain: 0.4240)
├── = 0:
├── [form] (gain: 0.7871)
├── = 0:
├── Class 1
├── = 1:
├── Class 1
├── = 2:
├── Class 3
└── = 3:
├── Class 1
├── =
1:
├── [form] (gain: 0.9940)
├── = 0:
├── Class 1
├── = 1:
├── Class 1
├── = 2:
├── Class 3
└── = 3:
├── Class 3
├── = 2:
├── Class 3
└──
= 3:
├── Class 3
├── = 1:
├── Class 1
└── = 2:
├── Class 1
├──
= 3:
├── [parents] (gain: 0.4674)
├── = 0:
├── [housing] (gain: 0.1941)
├── = 0:
├── [finance] (gain: 0.5239)
├── = 0:
├──
Class 1
└── = 1:

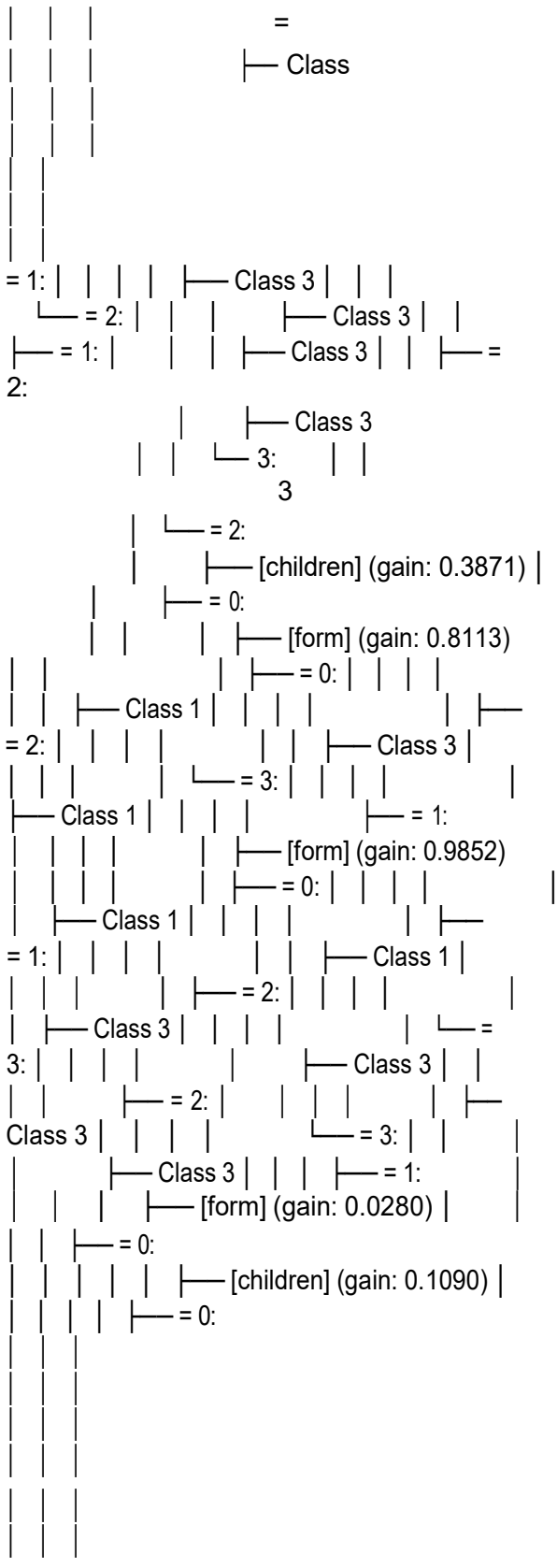

=
├── Class
[children] (gain: 0.4173)
= 0:
[form] (gain: 0.8813)
= 0:
Class 1
= 1:
Class 1
= 2:
Class 3
= 3:
Class 1
=
1:
[form] (gain: 0.9852)
= 0:
Class 1
= 1:
Class 1
= 2:
Class 3
=
3:
Class 3
= 2:
Class 3
= 3:
Class 3
= 1:
[form] (gain: 0.1462)
= 0:
[children] (gain: 0.8524)
= 0:
Class 1
= 1:
Class 3
=
2:
Class 3

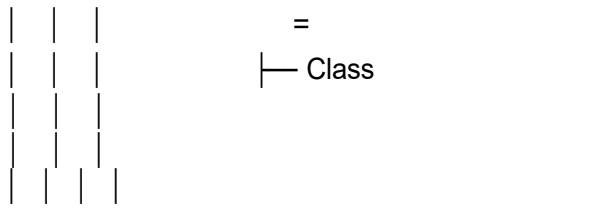

└── = 3:
Class 3
├── Class 3
├── Class 3
└── = 2:
├── [children] (gain: 0.3591)
├── = 0:
├── [form] (gain: 0.9183)
├── = 0:
├── Class 1
1
├── = 2:
├── Class 3
└── = 3:
├── Class 1
1:
├── [form] (gain: 0.9940)
├── = 0:
├── Class 1
├── = 1:
├── Class 1
├── = 2:
├── Class 3
└── = 3:
├── Class 3
├── = 2:
├── Class 3
3:
├── Class 3
= 1:
├── Class 1
└── = 2:
├── Class 1
└── = 4:
├── [form] (gain: 0.0257)
├── = 0:

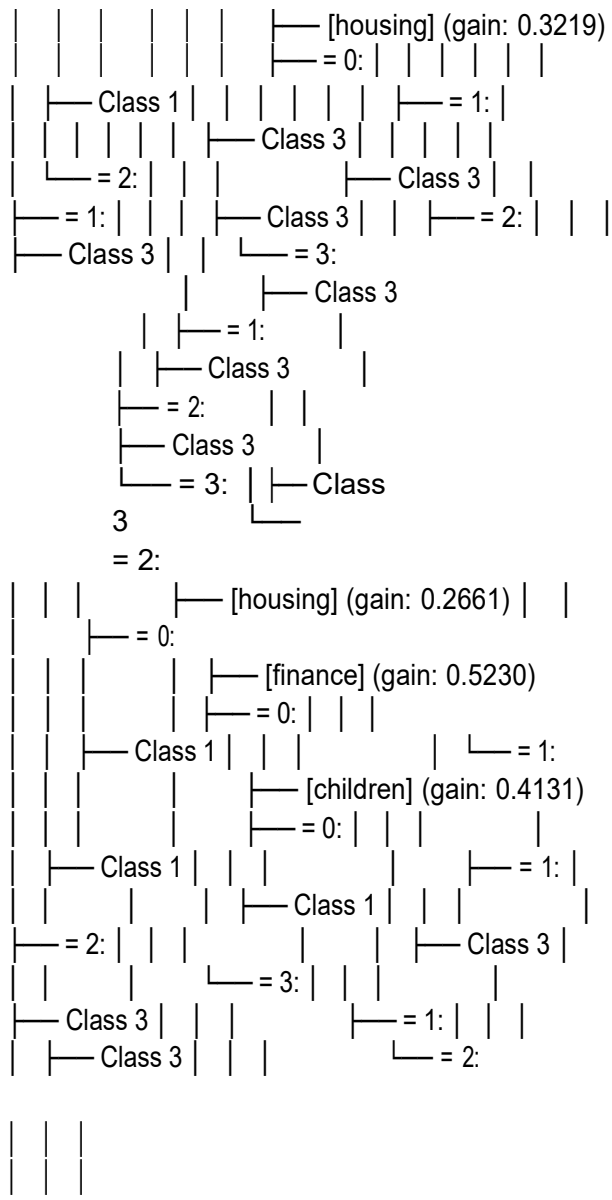

=
├── Class
[children] (gain: 0.1010)
= 0:
[housing] (gain: 0.3429)
= 0:
[finance] (gain: 0.9975)
= 0:
= 1:
Class 1
Class 3
Class 3
= 1:
Class 3
= 2:
Class 3
= 1:
Class 3
=
2:
Class 3

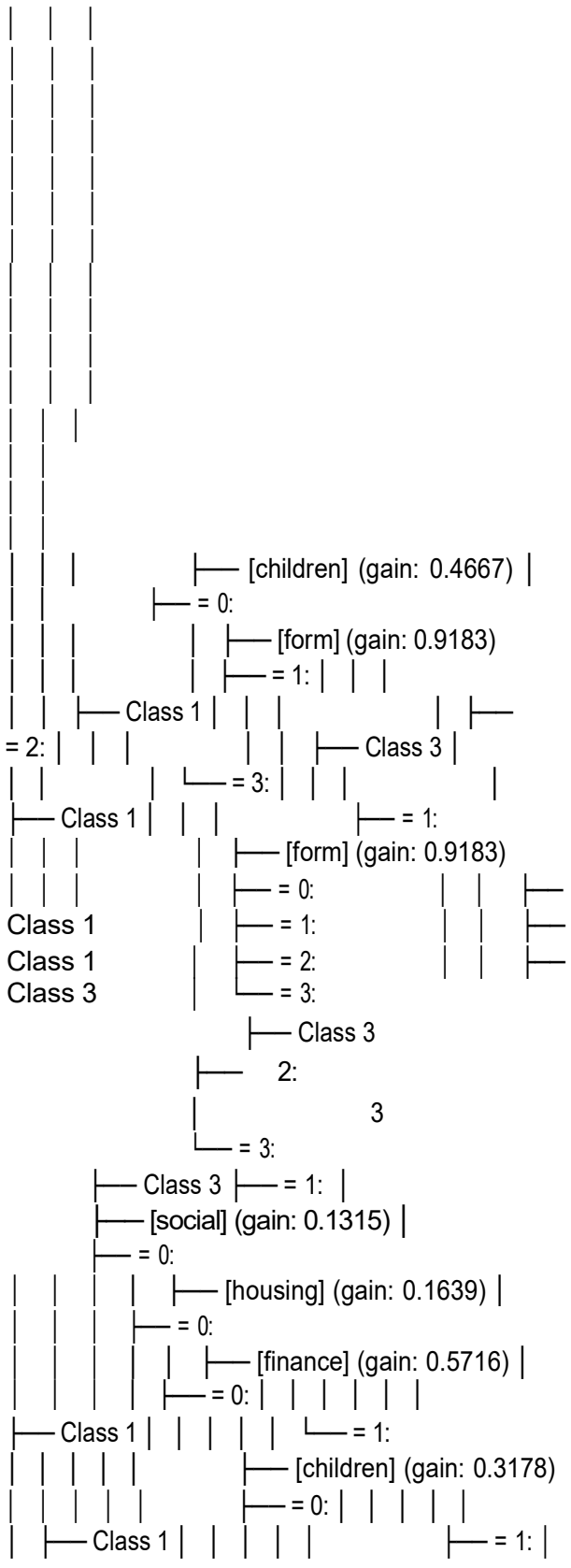

└── = 3:
├── Class 3 ├── =
1: │ ├── Class 3
├── = 2: │
├── Class 3 └── =
3: │ ├── Class 3
├── = 2:
│ ├── [has_nurs] (gain: 0.2950) │ ├──
= 0:
│ │ ├── [parents] (gain: 0.2187) │ │
├── = 0:
│ │ │ ├── [social] (gain: 0.1160) │ │
│ ├── = 0:
│ │ │ │ ├── [housing] (gain: 0.1454) │
│ │ │ ├── = 0:
│ │ │ │ │ ├── [finance] (gain: 0.6675) │
│ │ │ │ ├── = 0: │ │ │ │ │ │
├── Class 1 │ │ │ │ └── = 1:
│ │ │ │ │ ├── [children] (gain:
0.2536)
│ │ │ │ │ ├── = 0: │ │ │ │ │
│ ├── Class 1 │ │ │ │ │ ├── = 1: │
│ │ │ │ │ ├── Class 3 │ │ │ │ │
├── = 2: │ │ │ │ │ │ ├── Class 3 │
│ │ │ │ └── = 3: │ │ │ │ │ ├──
Class 3 │ │ │ │ ├── = 1: │ │ │ │ │
├── [children] (gain: 0.1818) │ │ │ │ │
├── = 0:
│ │ │ │ │ │ ├── [form] (gain: 0.9183) │
│ │ │ │ │ ├── = 0: │ │ │ │ │
│ │ ├── Class 1 │ │ │ │ │ │ ├── │
│ │
│ │ │

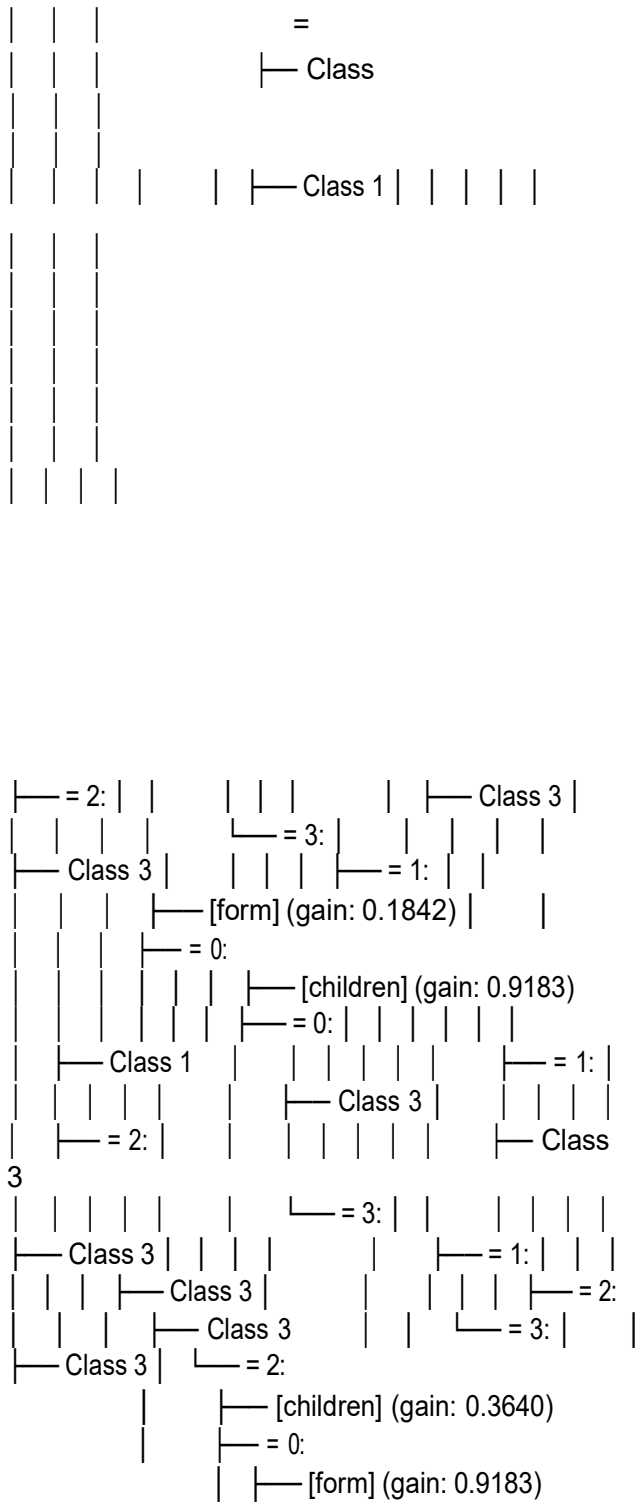

=
Class

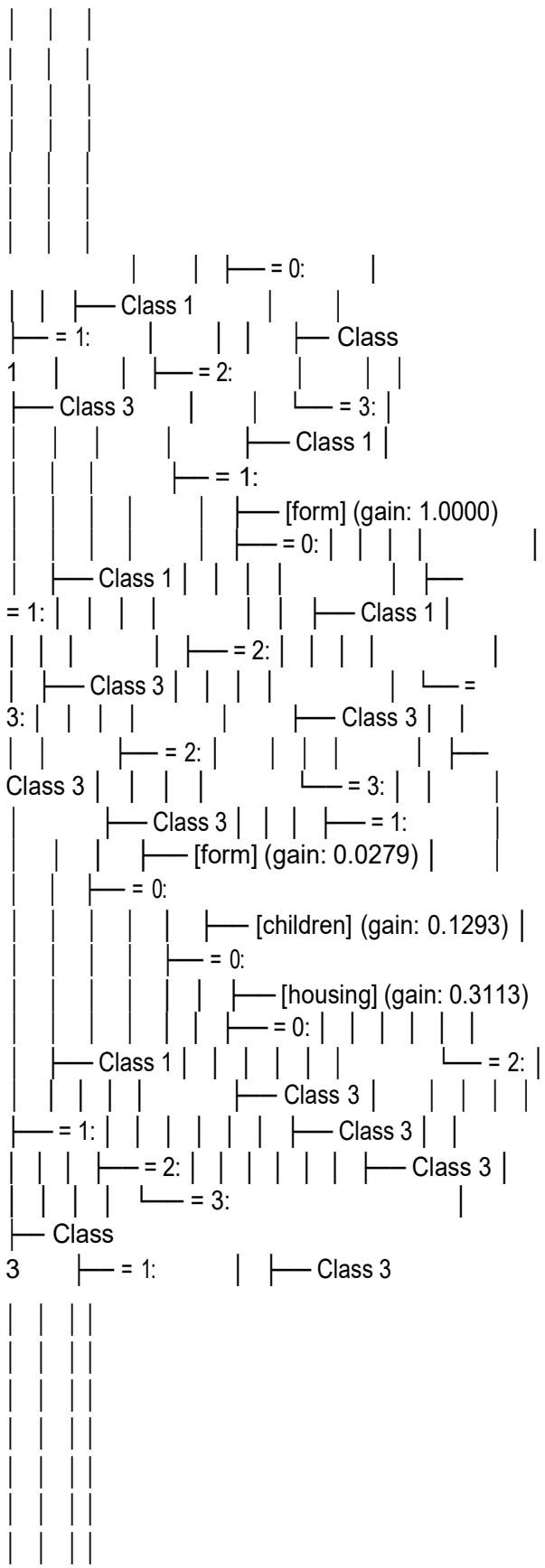

=
Class
= 1:
Class 3
= 2:
Class 3
= 1:
Class 3
2:
Class 3
3:
3
= 2:
[children] (gain: 0.3871)
= 0:
[form] (gain: 0.8113)
= 0:
Class 1
= 2:
Class 3
= 3:
Class 1
= 1:
[form] (gain: 0.9852)
= 0:
Class 1
= 1:
Class 1
= 2:
Class 3
3:
Class 3
= 2:
Class 3
Class 3
= 3:
Class 3
= 1:
[form] (gain: 0.0280)
= 0:
[children] (gain: 0.1090)
= 0:

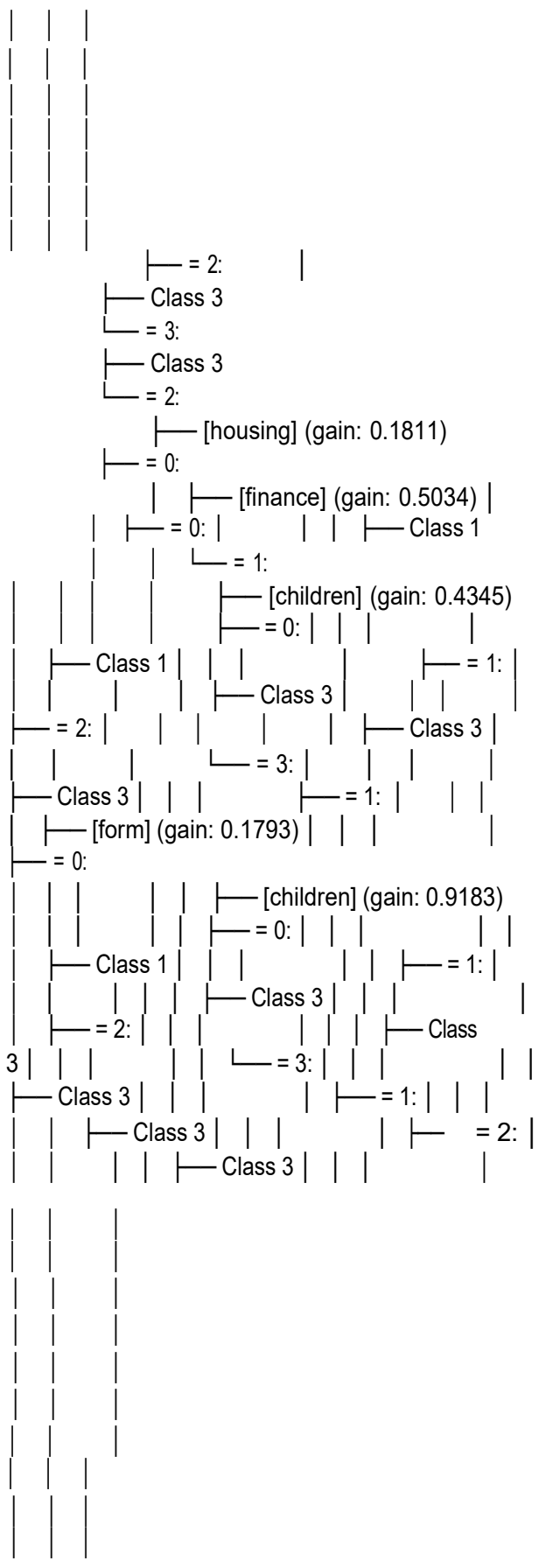

=
Class

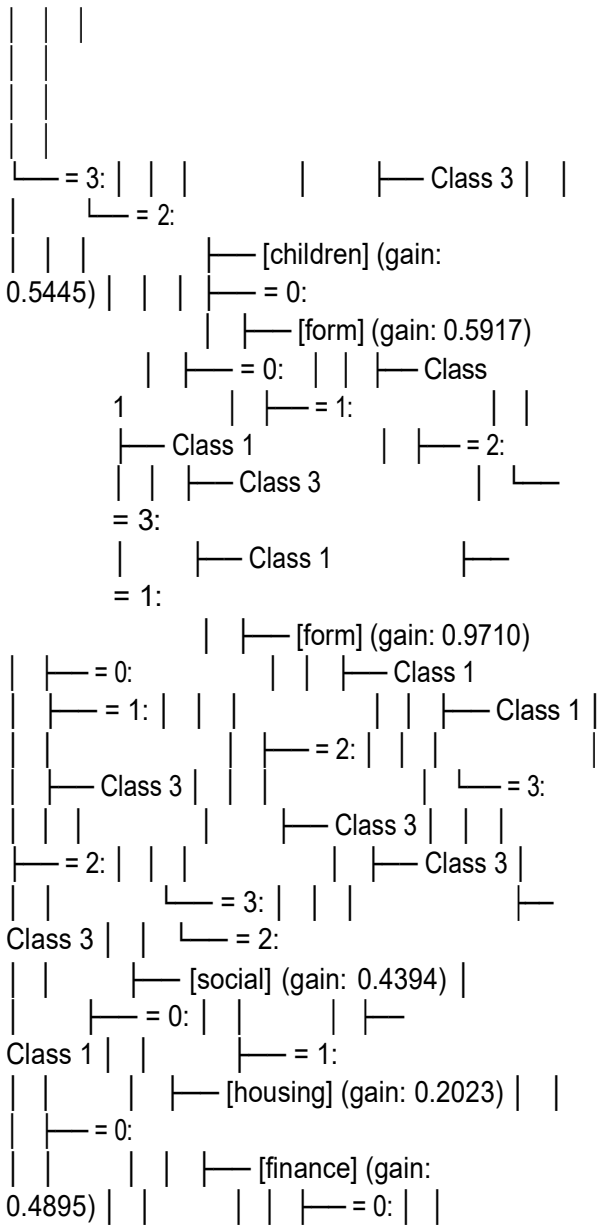

[housing] (gain: 0.3219)
= 0:
Class 1
= 1:
Class 3
= 2:
Class 3
Class 3
= 1:
Class 3
= 2:
Class 3
= 3:
Class 3
= 1:
Class 3
= 2:
Class 3
= 3:
Class
3
= 2:
[housing] (gain: 0.2661)
= 0:
[finance] (gain: 0.5230)
= 0:
Class 1
= 1:
[children] (gain: 0.4131)
= 0:
Class 1
= 1:
Class 1
= 2:
Class 3
= 3:
Class 3
= 1:
Class 3
= 2:

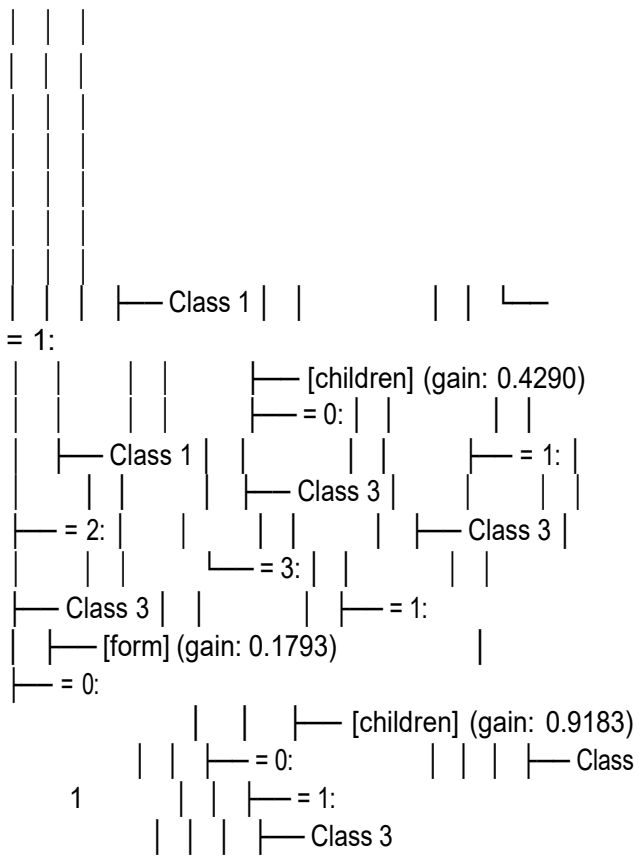

[children] (gain: 0.4667)
= 0:
[form] (gain: 0.9183)
= 1:
Class 1
= 2:
Class 3
= 3:
Class 1
= 1:
[form] (gain: 0.9183)
= 0:
= 1:
= 2:
= 3:
Class 1
Class 1
Class 3
Class 3
2:
3
= 3:
Class 3
= 1:
[social] (gain: 0.1315)
= 0:
[housing] (gain: 0.1639)
= 0:
[finance] (gain: 0.5716)
= 0:
= 1:
Class 1
[children] (gain: 0.3178)
= 0:
Class 1
= 1:

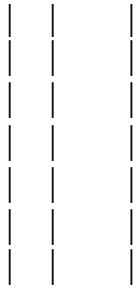

=
Class
Class 1
[form] (gain: 0.1842)
= 0:
[children] (gain: 0.9183)
= 0:
Class 1
= 1:
Class 3
= 2:
Class 3
= 3:
Class 3
= 1:
Class 3
= 2:
Class 3
= 3:
Class 3
= 2:
[children] (gain: 0.3640)
= 0:
[form] (gain: 0.9183)


= 0:
Class 1
= 1:
Class
1
= 2:
Class 3
= 3:
Class 1
= 1:
[form] (gain: 1.0000)
= 0:
Class 1
= 1:
Class 1
= 2:
Class 3
=
3:
Class 3
= 2:
Class 3
= 3:
Class 3
= 1:
[form] (gain: 0.0279)
= 0:
[children] (gain: 0.1293)
= 0:
[housing] (gain: 0.3113)
= 0:
Class 1
= 2:
Class 3
= 1:
Class 3
= 2:
Class 3
= 3:
Class
3
= 1:
Class 3

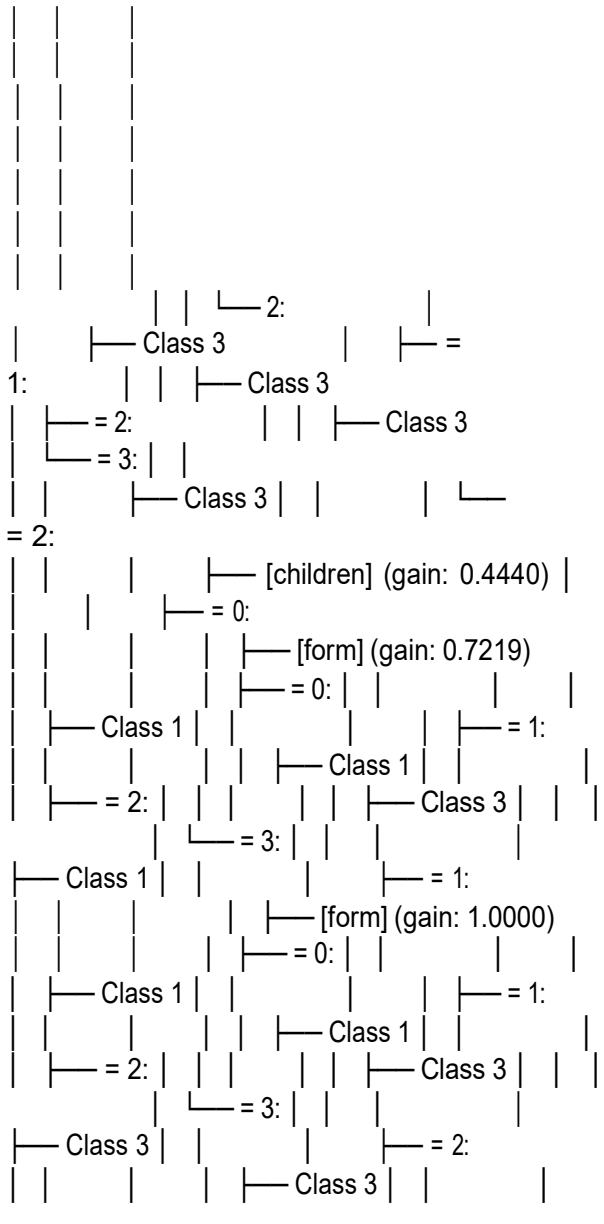

= 2:
Class 3
= 3:
Class 3
= 2:
[housing] (gain: 0.1811)
= 0:
[finance] (gain: 0.5034)
= 0:
Class 1
= 1:
[children] (gain: 0.4345)
= 0:
Class 1
= 1:
Class 3
= 2:
Class 3
= 3:
Class 3
= 1:
[form] (gain: 0.1793)
= 0:
[children] (gain: 0.9183)
= 0:
Class 1
= 1:
Class 3
= 2:
Class
3
= 3:
Class 3
= 1:
Class 3
= 2:
Class 3

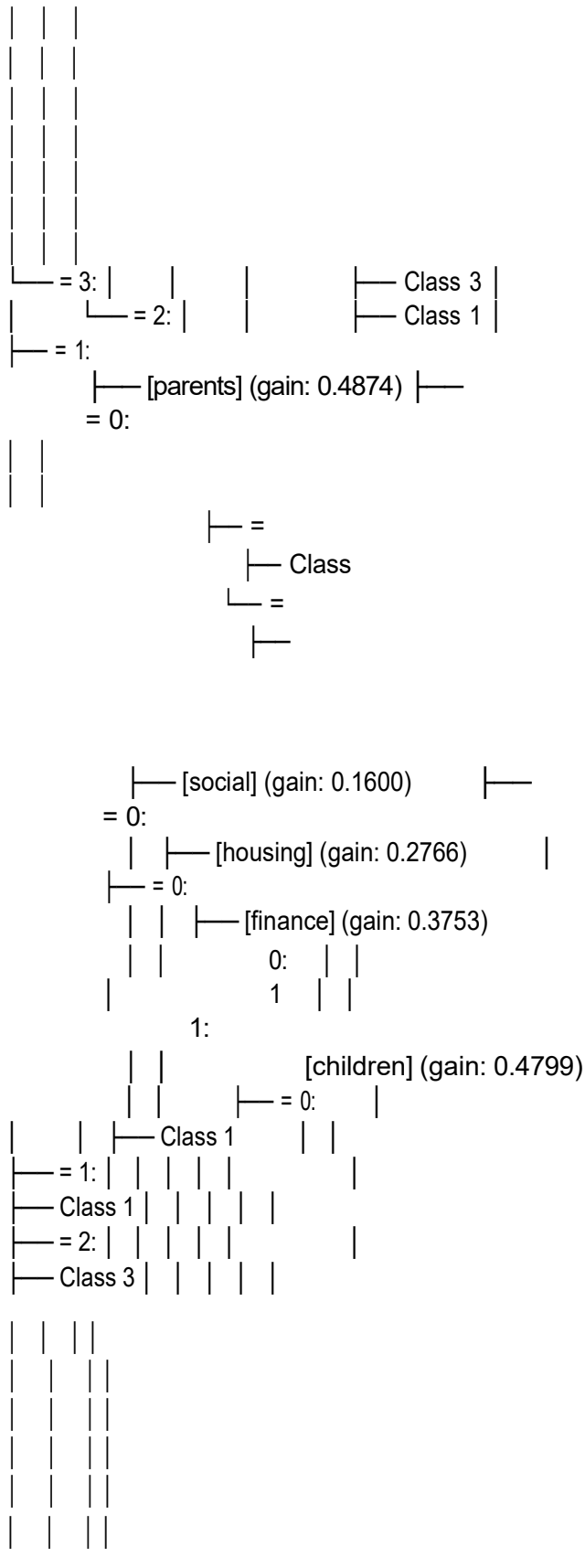



├── Class 1
= 1:
├── [children] (gain: 0.4290)
├── = 0:
├── Class 1
├── = 1:
├── Class 3
├── = 2:
├── Class 3
└── = 3:
├── Class 3
├── = 1:
├── [form] (gain: 0.1793)
├── = 0:
├── [children] (gain: 0.9183)
├── = 0:
├── Class
1
├── = 1:
├── Class 3

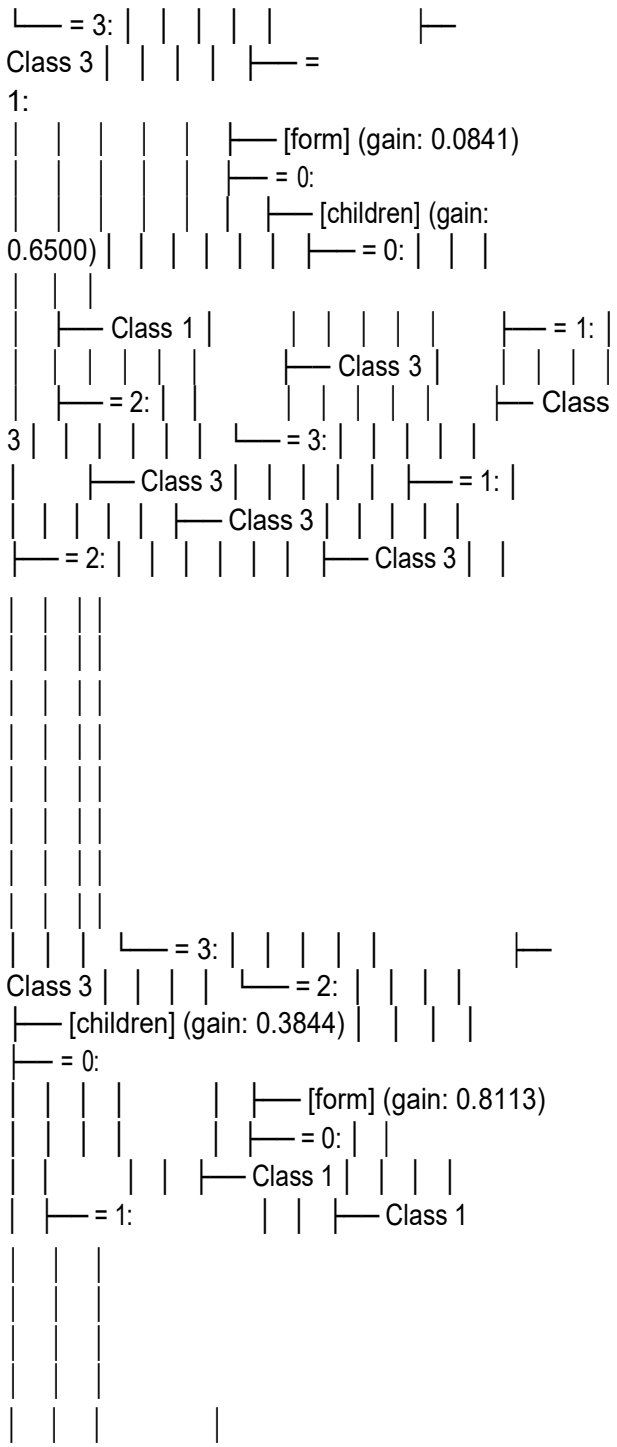


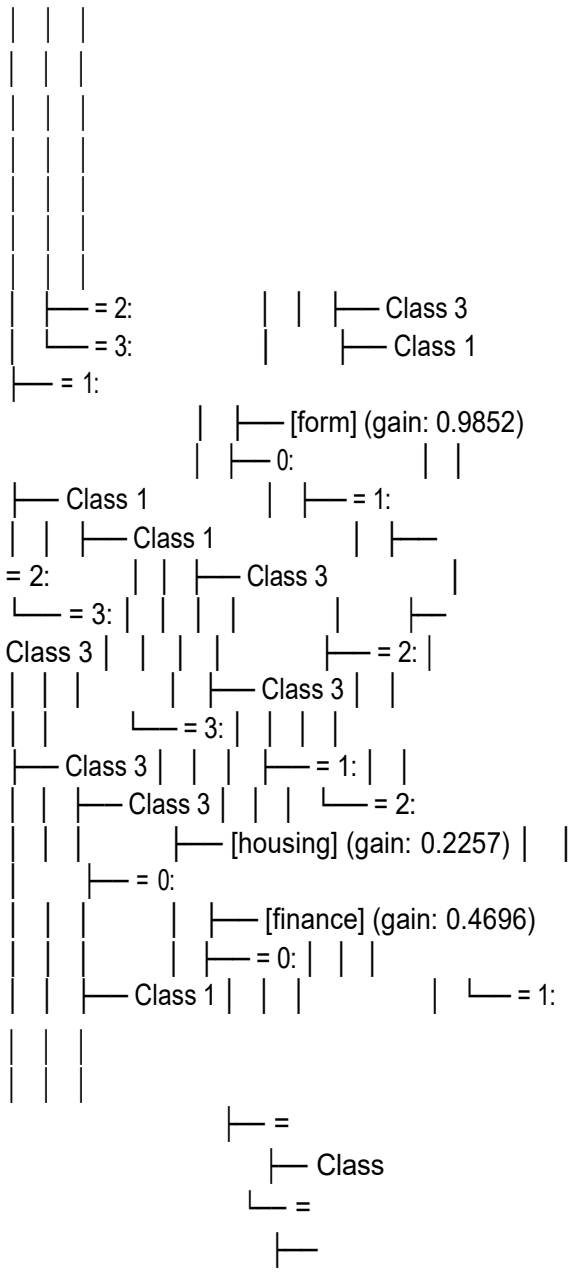
=


└── 2:
├── Class 3
├── =
1:
├── Class 3
├── = 2:
├── Class 3
└── = 3:
├── Class 3
└──
= 2:
├── [children] (gain: 0.4440)
├── = 0:
├── [form] (gain: 0.7219)
├── = 0:
├── Class 1
├── = 1:
├── Class 1
├── = 2:
├── Class 3
└── = 3:
├── Class 1
├── = 1:
├── [form] (gain: 1.0000)
├── = 0:
├── Class 1
├── = 1:
├── Class 1
├── = 2:
├── Class 3
└── = 3:
├── Class 3
├── = 2:
├── Class 3

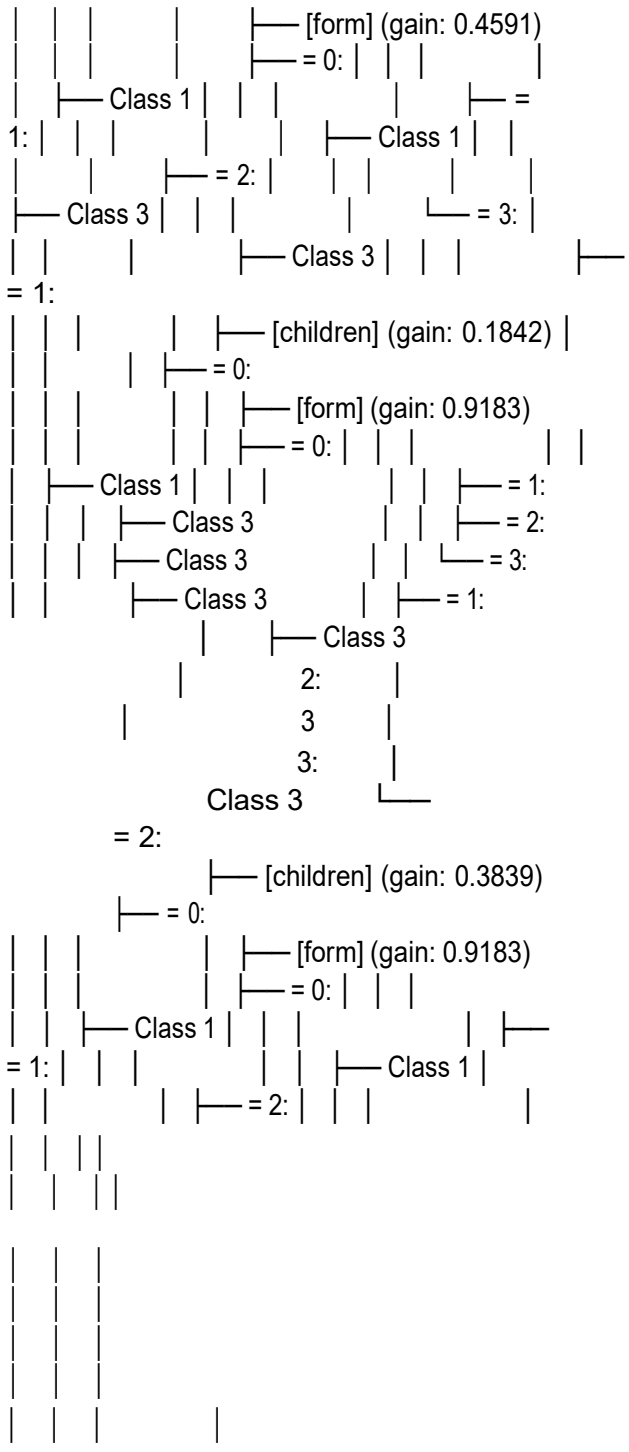

└── = 3: ├── Class 3
└── = 2: ├── Class 1
├── = 1:
├── [parents] (gain: 0.4874) ├──
= 0:
├── =
├── Class
└── =
├──
├── [social] (gain: 0.1600) ├──
= 0:
├── [housing] (gain: 0.2766)
├── = 0:
├── [finance] (gain: 0.3753)
0:
1:
1:
[children] (gain: 0.4799)
├── = 0:
├── Class 1
├── = 1:
├── Class 1
├── = 2:
├── Class 3

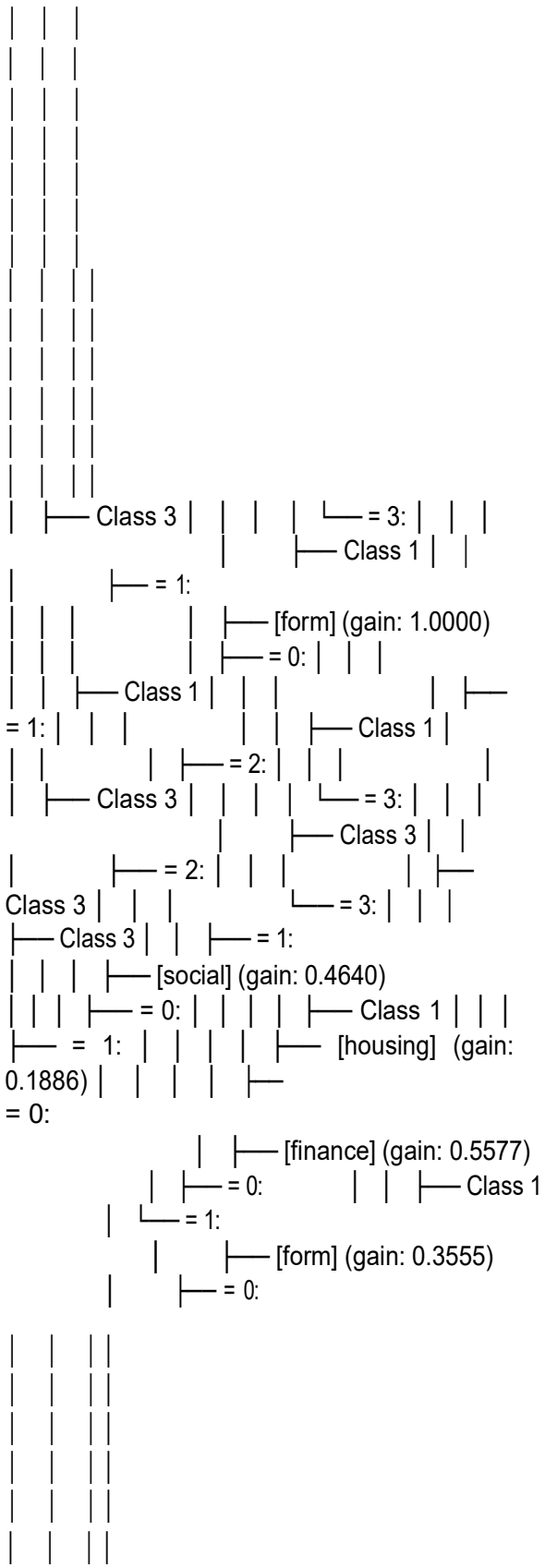
=


└── = 3: │ │ │ │ │ ├──
Class 3 │ │ │ │ ├── =
1:
│ │ │ │ │ ├── [form] (gain: 0.0841)
│ │ │ │ │ ├── = 0:
│ │ │ │ │ │ ├── [children] (gain:
0.6500) │ │ │ │ │ │ ├── = 0: │ │ │
│ │ │
│ ├── Class 1 │ │ │ │ │ ├── = 1: │
│ │ │ │ │ ├── Class 3 │ │ │ │
│ ├── = 2: │ │ │ │ │ │ ├── Class
3 │ │ │ │ │ │ └── = 3: │ │ │ │ │
│ ├── Class 3 │ │ │ │ ├── = 1: │
│ │ │ │ │ ├── Class 3 │ │ │ │ │
├── = 2: │ │ │ │ │ │ ├── Class 3 │ │
│ │ │
│ │ │
│ │ │
│ │ │
│ │ │
│ │ │
│ │ │
│ │ │
│ │ │ └── = 3: │ │ │ │ │ ├──
Class 3 │ │ │ │ └── = 2: │ │ │ │
├── [children] (gain: 0.3844) │ │ │ │
├── = 0:
│ │ │ │ │ ├── [form] (gain: 0.8113)
│ │ │ │ │ ├── = 0: │ │
│ │ │ │ ├── Class 1 │ │ │ │
│ ├── = 1: │ │ ├── Class 1
│ │ │
│ │ │
│ │ │
│ │ │
│ │ │ │

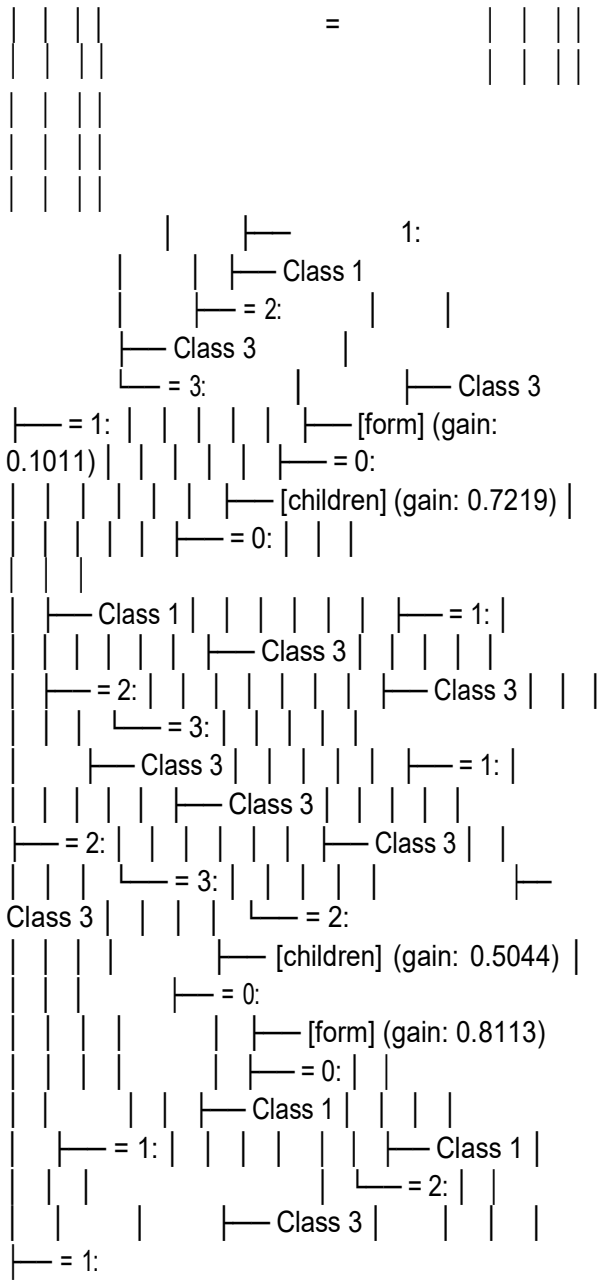

= 2:
Class 3
= 3:
Class 1
= 1:
[form] (gain: 0.9852)
0:
Class 1
= 1:
Class 1
Class 3
Class 3
= 2:
= 3:
Class 3
= 2:
Class 3
Class 3
= 1:
Class 3
= 2:
[housing] (gain: 0.2257)
= 0:
[finance] (gain: 0.4696)
= 0:
Class 1
= 1:
=
Class
=

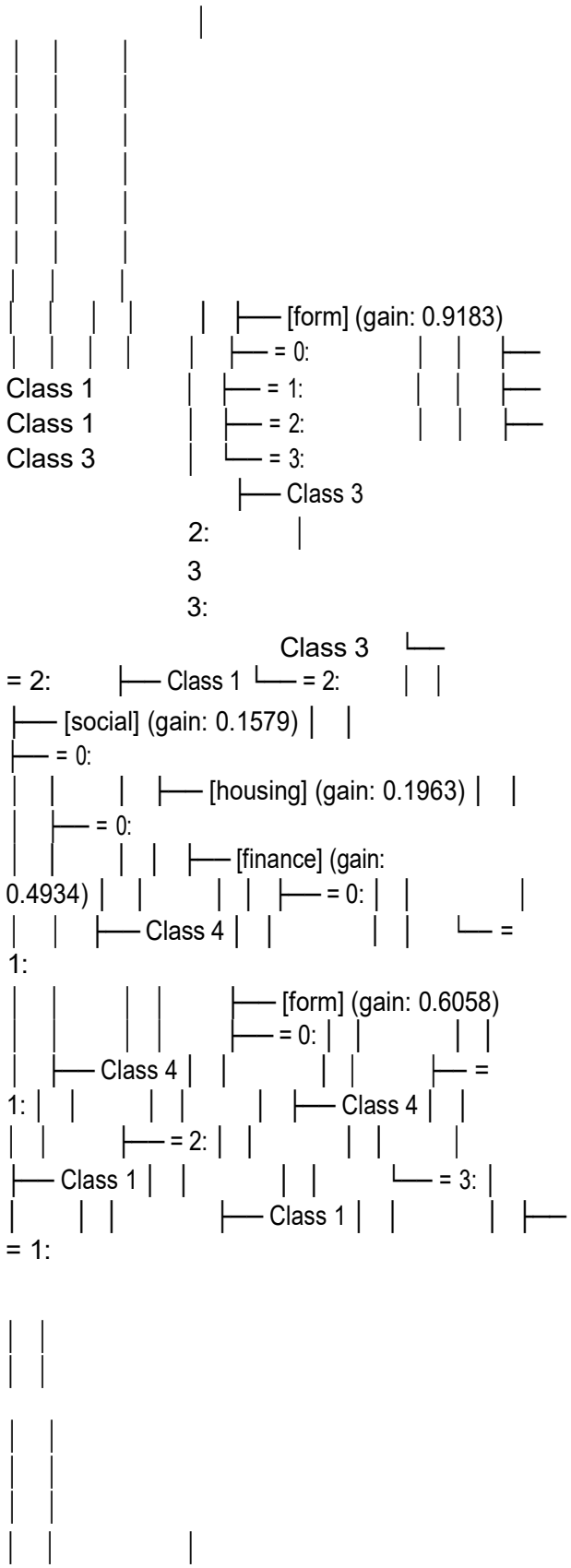
=

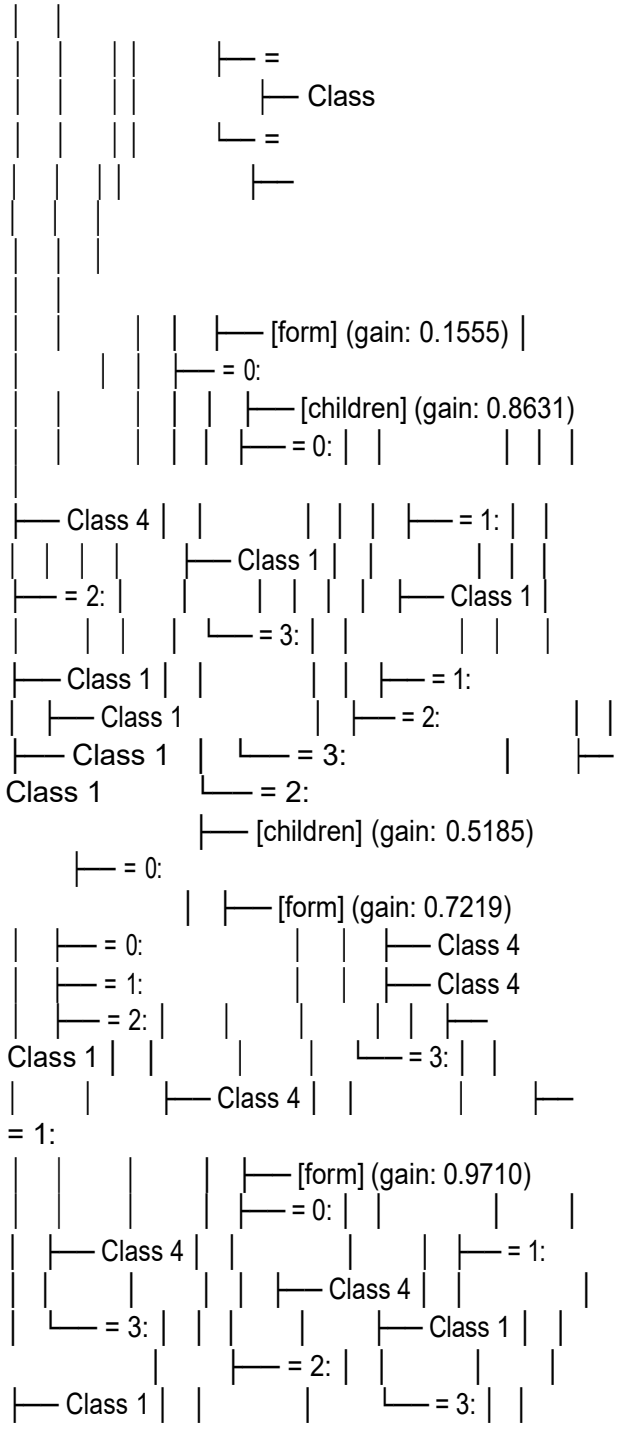

[form] (gain: 0.4591)
= 0:
Class 1
=
1:
Class 1
= 2:
Class 3
= 3:
Class 3
=
= 1:
[children] (gain: 0.1842)
= 0:
[form] (gain: 0.9183)
= 0:
Class 1
= 1:
Class 3
= 2:
Class 3
= 3:
Class 3
= 1:
Class 3
2:
3
3:
Class 3
= 2:
[children] (gain: 0.3839)
= 0:
[form] (gain: 0.9183)
= 0:
Class 1
=
1:
Class 1

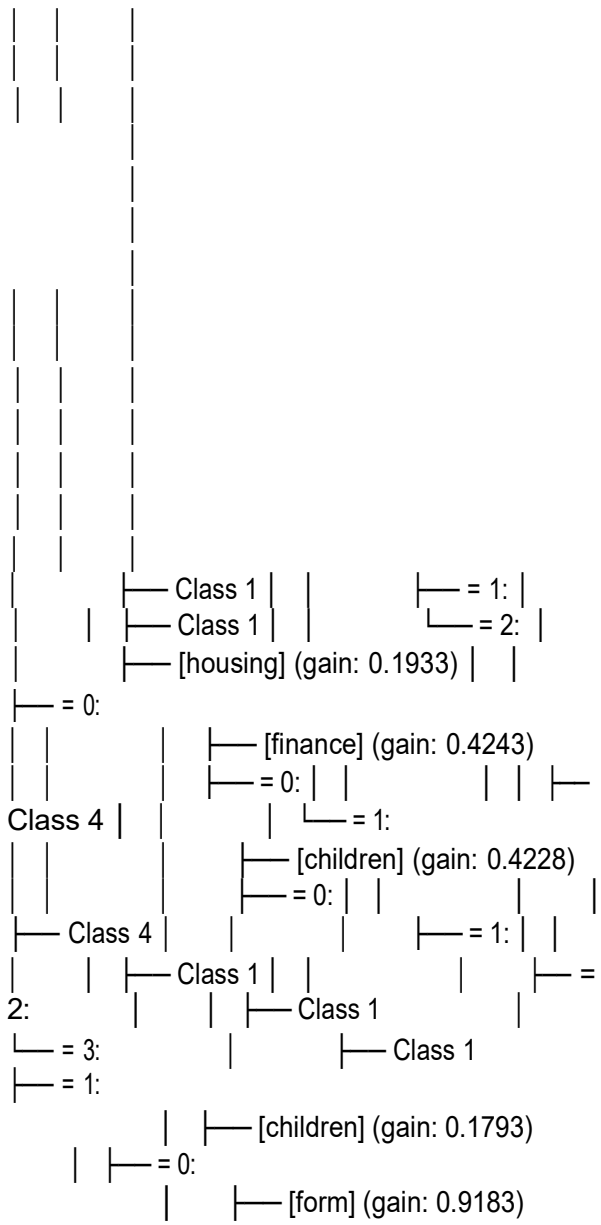

├── Class 3
└── = 3:
├── Class 1
├── = 1:
├── [form] (gain: 1.0000)
├── = 0:
├── Class 1
= 1:
├── Class 1
├── = 2:
├── Class 3
└── = 3:
├── Class 3
├── = 2:
Class 3
└── = 3:
├── Class 3
├── = 1:
├── [social] (gain: 0.4640)
├── = 0:
├── Class 1
├── = 1:
├── [housing] (gain:
0.1886)
= 0:
├── [finance] (gain: 0.5577)
├── = 0:
├── Class 1
└── = 1:
├── [form] (gain: 0.3555)
├── = 0:

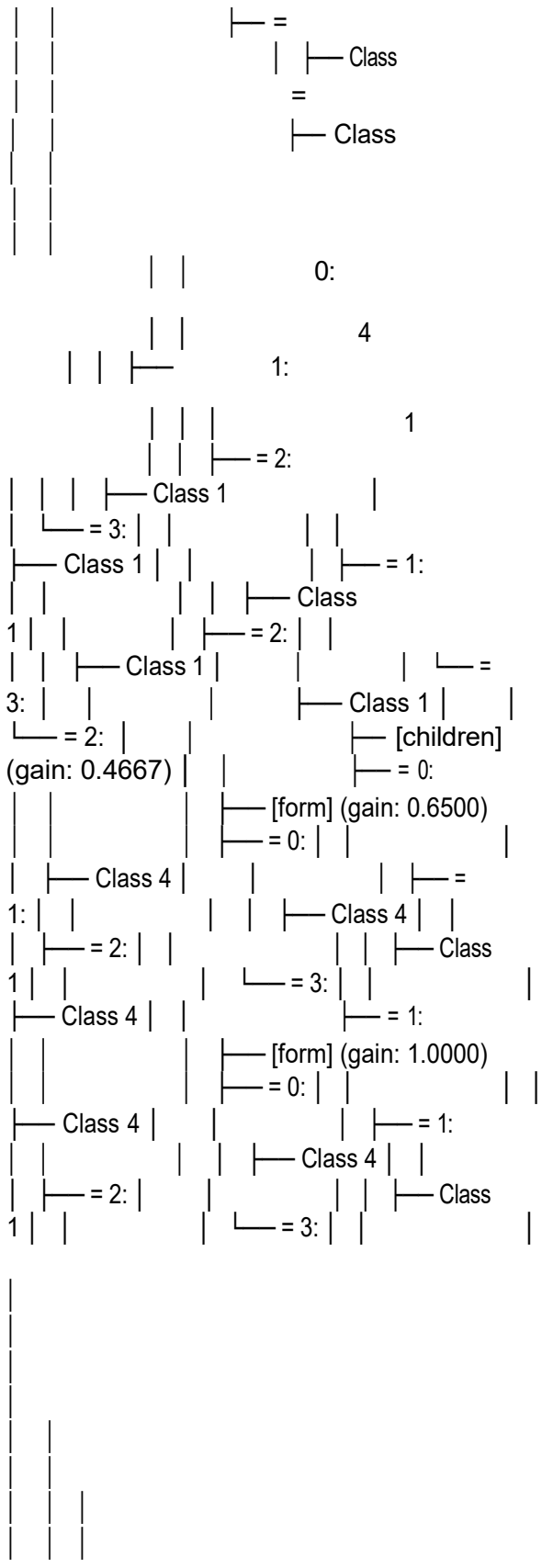

=
Class 3

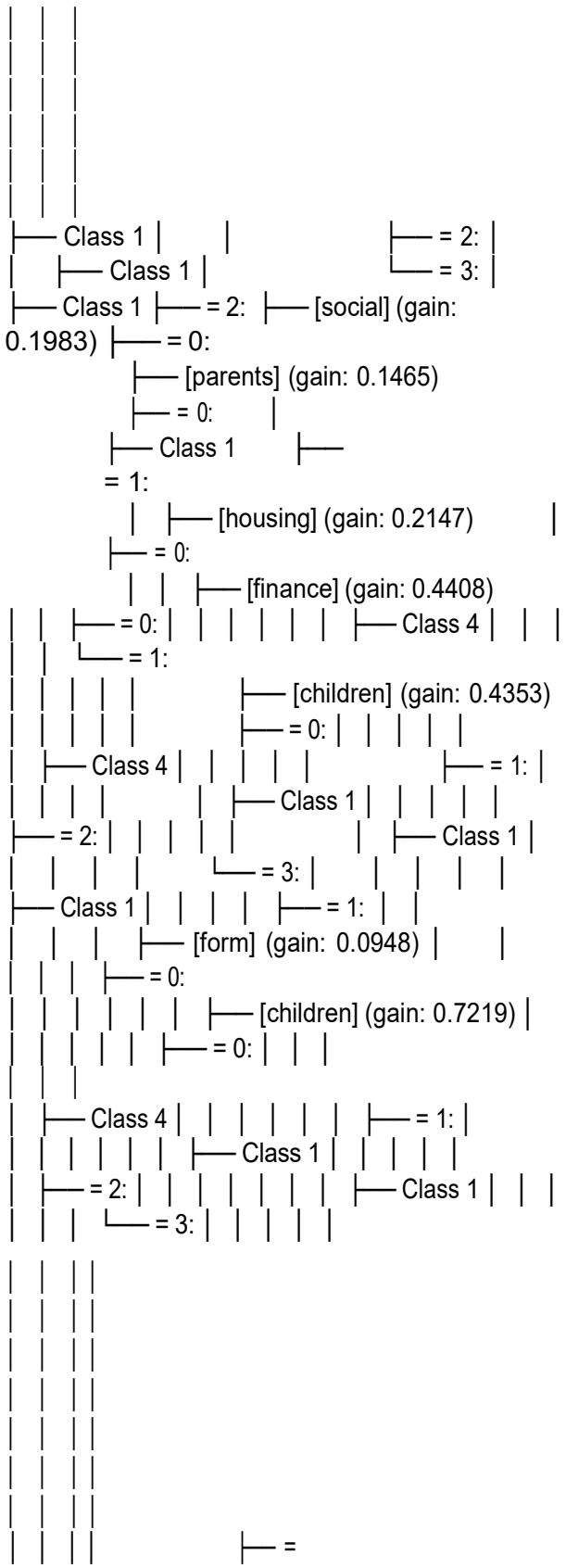

=
1:
Class 1
= 2:
Class 3
= 3:
Class 3
= 1:
[form] (gain:
0.1011)
= 0:
[children] (gain: 0.7219)
= 0:
Class 1
= 1:
Class 3
= 2:
Class 3
= 3:
Class 3
= 1:
Class 3
= 2:
Class 3
= 3:
Class 3
= 2:
[children] (gain: 0.5044)
= 0:
[form] (gain: 0.8113)
= 0:
Class 1
= 1:
Class 1
= 2:
Class 3
= 1:

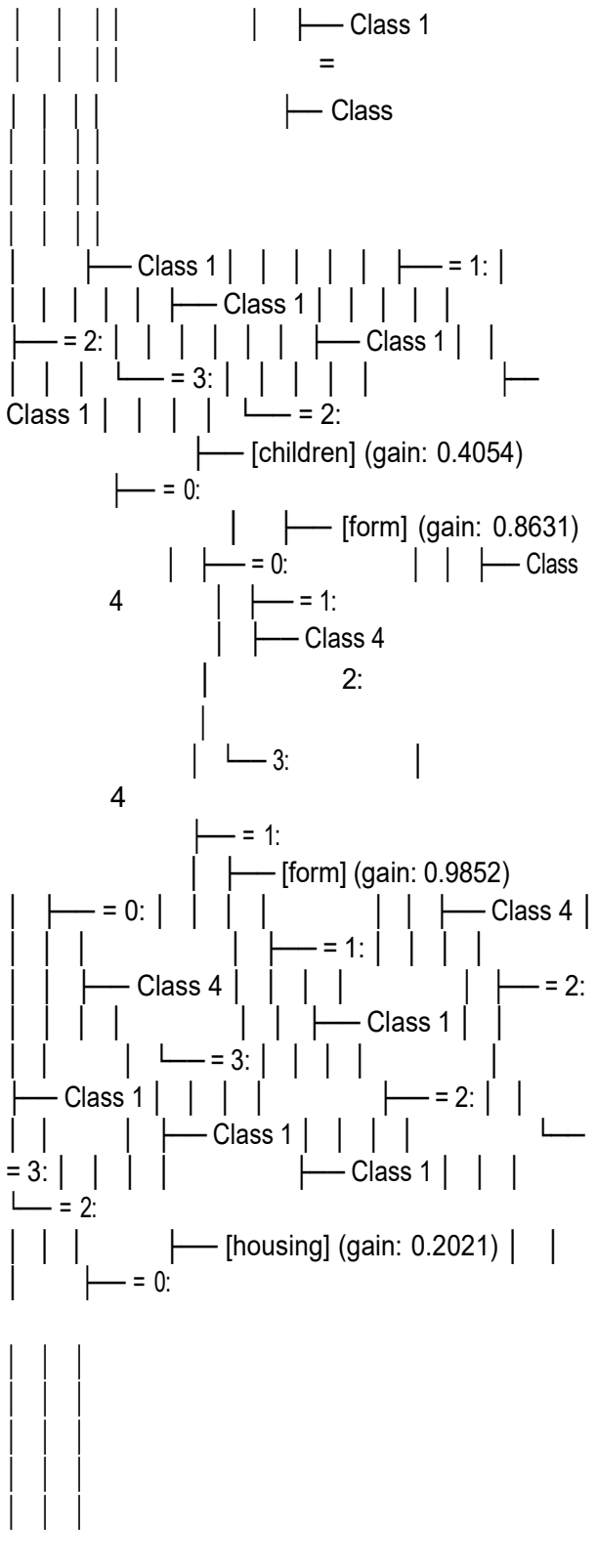

[form] (gain: 0.9183)
= 0:
= 1:
= 2:
= 3:
Class 1
Class 1
Class 3
Class 3
2:
3
3:
Class 3
= 2:
Class 1
= 2:
[social] (gain: 0.1579)
= 0:
[housing] (gain: 0.1963)
= 0:
[finance] (gain:
0.4934)
= 0:
Class 4
=
1:
[form] (gain: 0.6058)
= 0:
Class 4
=
1:
Class 4
= 2:
Class 1
= 3:
Class 1
=
1:

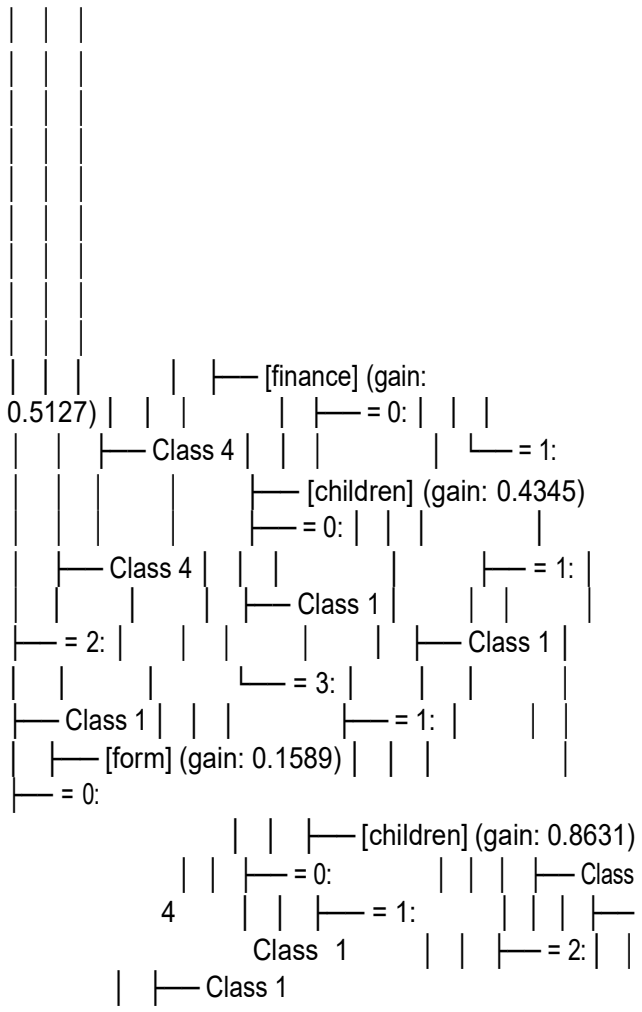

├── =
├── Class
└── =
[form] (gain: 0.1555)
= 0:
[children] (gain: 0.8631)
= 0:
Class 4
= 1:
Class 1
= 2:
Class 1
= 3:
Class 1
= 1:
= 2:
[children] (gain: 0.5185)
= 0:
[form] (gain: 0.7219)
= 0:
Class 4
= 1:
Class 4
= 2:
Class 1
= 3:
Class 4
= 1:
[form] (gain: 0.9710)
= 0:
Class 4
= 1:
Class 4
= 3:
Class 1
= 2:
Class 1
= 3:

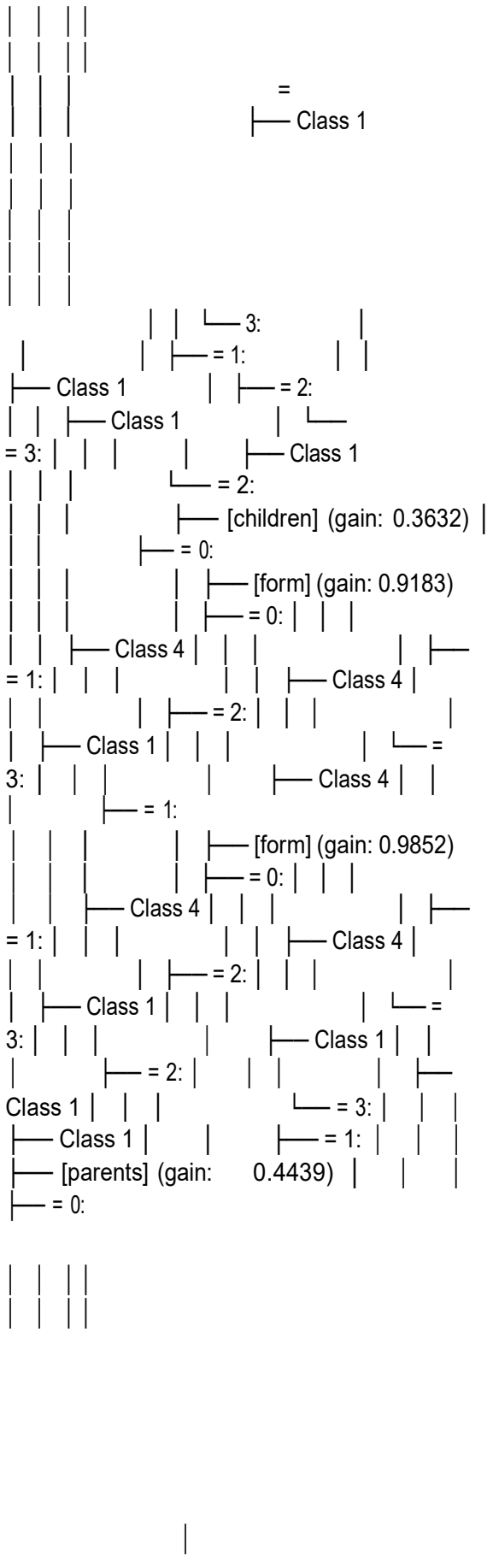

├── Class 1
├── = 1:
├── Class 1
└── = 2:
├── [housing] (gain: 0.1933)
├── = 0:
├── [finance] (gain: 0.4243)
├── = 0:
└── = 1:
├── [children] (gain: 0.4228)
├── = 0:
├── Class 4
├── = 1:
├── Class 1
├── = 2:
├── Class 1
└── = 3:
├── Class 1
├── = 1:
├── [children] (gain: 0.1793)
├── = 0:
├── [form] (gain: 0.9183)

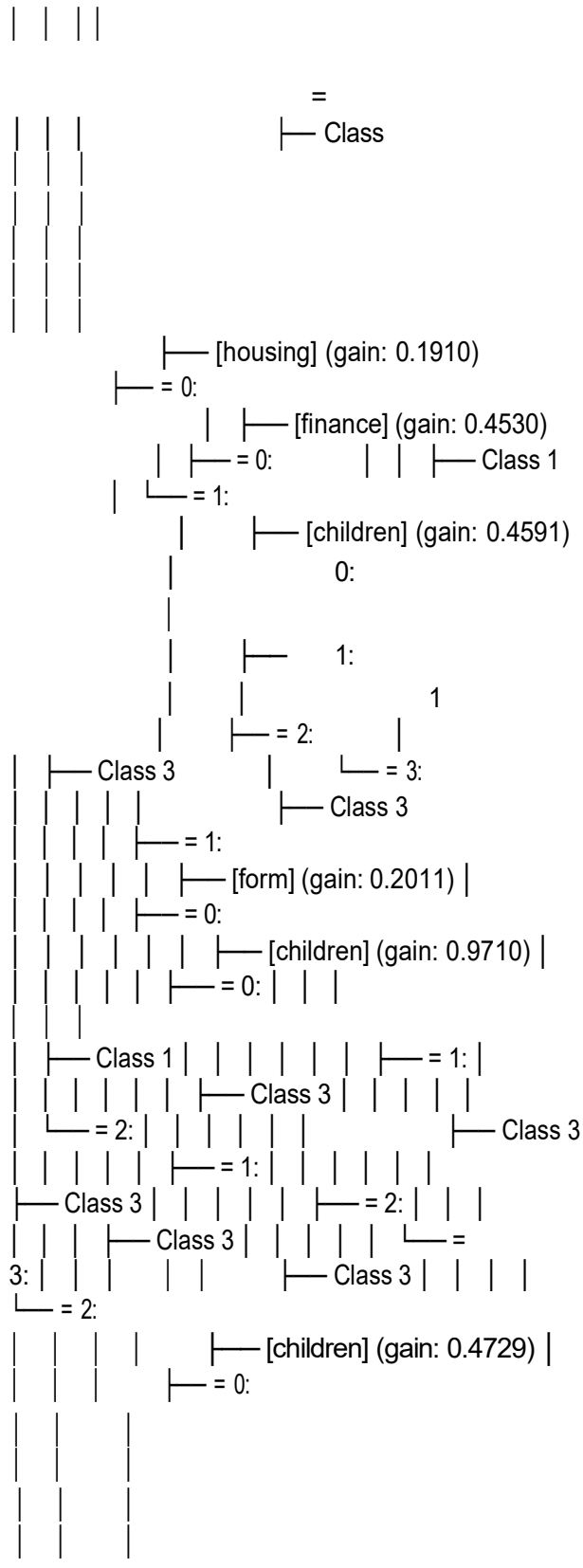

├── =
Class
=
├── Class
0:
4
1:
1
├── = 2:
├── Class 1
├── = 3:
├── Class 1
├── = 1:
├── Class
1
├── = 2:
├── Class 1
└── =
3:
├── Class 1
└── = 2:
├── [children]
(gain: 0.4667)
├── = 0:
├── [form] (gain: 0.6500)
├── = 0:
├── Class 4
├── =
1:
├── Class 4
├── = 2:
├── Class
1
└── = 3:
├── Class 4
├── = 1:
├── [form] (gain: 1.0000)
├── = 0:
├── Class 4
├── = 1:
├── Class 4
├── = 2:
├── Class
1
└── = 3:

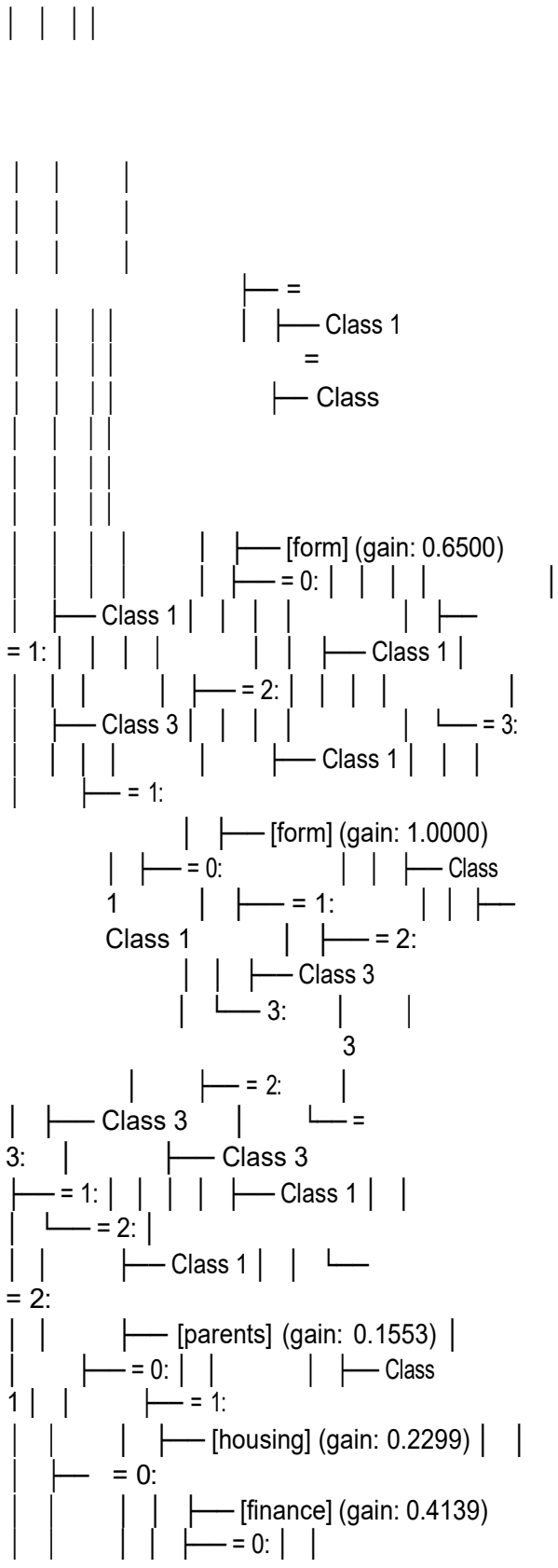

Class 1
Class 1
Class 1
= 2:
= 3:
= 2:
[social] (gain:
0.1983)
= 0:
[parents] (gain: 0.1465)
= 0:
Class 1
= 1:
[housing] (gain: 0.2147)
= 0:
[finance] (gain: 0.4408)
= 0:
Class 4
= 1:
[children] (gain: 0.4353)
= 0:
Class 4
= 1:
Class 1
= 2:
Class 1
= 3:
Class 1
= 1:
[form] (gain: 0.0948)
= 0:
[children] (gain: 0.7219)
= 0:
Class 4
= 1:
Class 1
= 2:
Class 1
= 3:
=

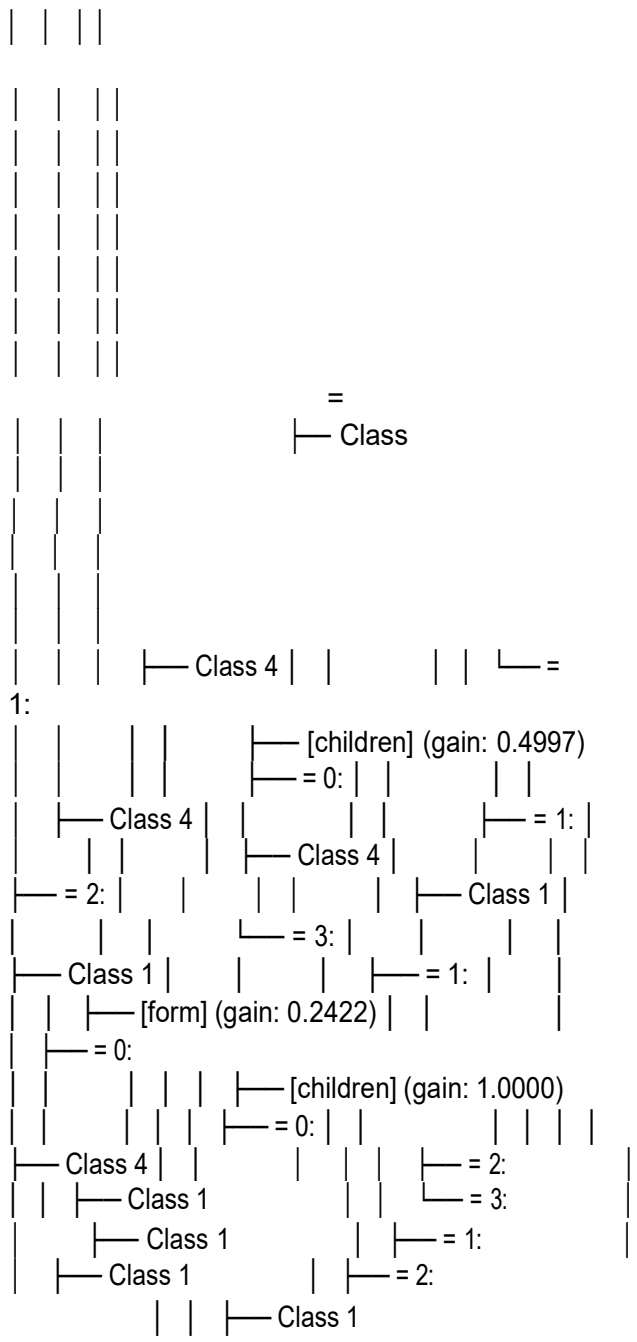

├── Class 1
=
├── Class
├── Class 1 ├── = 1:
├── Class 1
├── = 2: ├── Class 1
└── = 3: ├──
Class 1 └── = 2:
├── [children] (gain: 0.4054)
├── = 0:
├── [form] (gain: 0.8631)
├── = 0: ├── Class
4 ├── = 1:
├── Class 4
2:
└── 3:
4
├── = 1:
├── [form] (gain: 0.9852)
├── = 0: ├── Class 4
├── = 1:
├── Class 4 ├── = 2:
├── Class 1
└── = 3:
├── Class 1 ├── = 2:
├── Class 1
= 3: ├── Class 1
└── = 2:
├── [housing] (gain: 0.2021)
├── = 0:

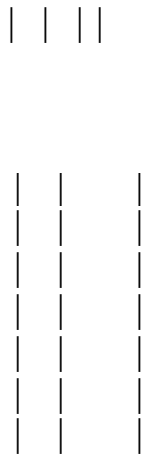

[finance] (gain:
0.5127)
= 0:
Class 4
= 1:
[children] (gain: 0.4345)
= 0:
Class 4
= 1:
Class 1
= 2:
Class 1
= 3:
Class 1
= 1:
[form] (gain: 0.1589)
= 0:
[children] (gain: 0.8631)
= 0:
Class
4
= 1:
Class 1
= 2:
Class 1

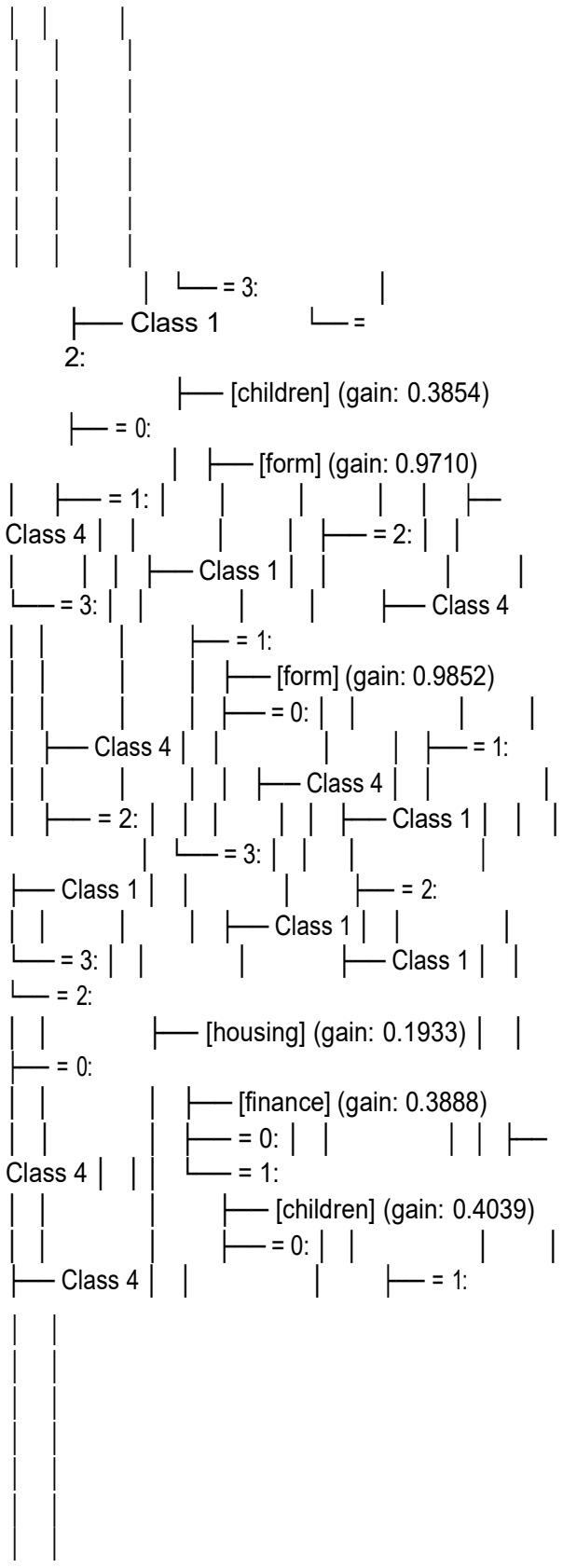

=
Class 1
└── 3:
= 1:
Class 1
= 2:
Class 1
└──
= 3:
Class 1
└── = 2:
[children] (gain: 0.3632)
= 0:
[form] (gain: 0.9183)
= 0:
Class 4
= 1:
Class 4
= 2:
Class 1
└── =
3:
Class 4
= 1:
[form] (gain: 0.9852)
= 0:
Class 4
= 1:
Class 4
= 2:
Class 1
└── =
3:
Class 1
= 2:
└── = 3:
Class 1
= 1:
[parents] (gain: 0.4439)
= 0:

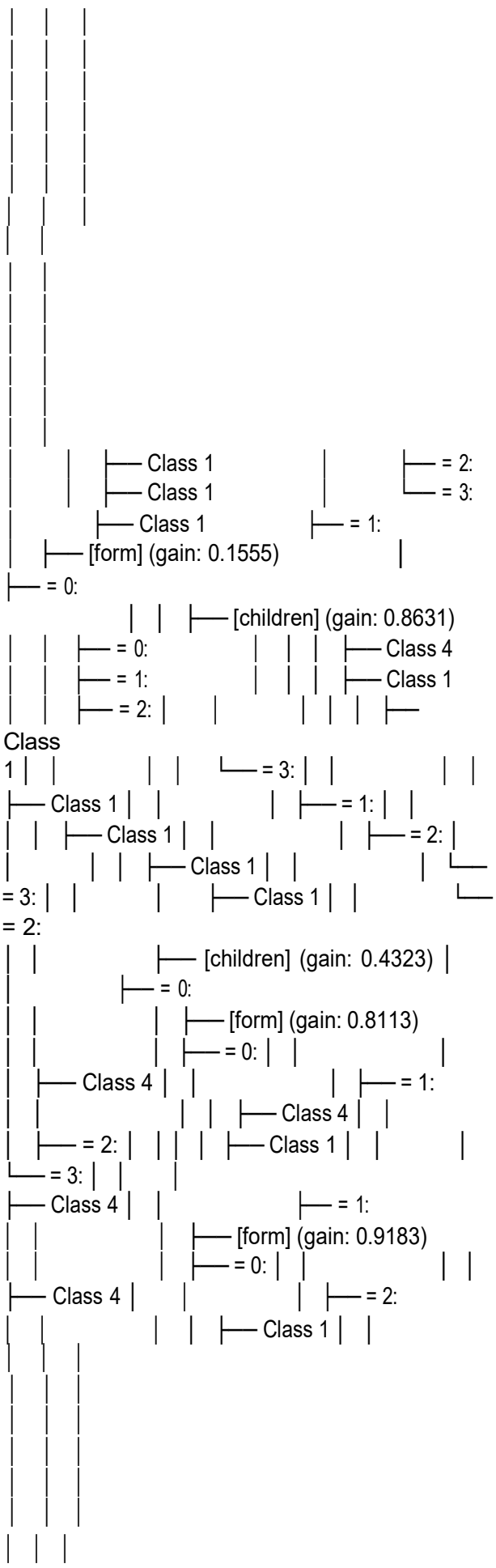

=
Class
[housing] (gain: 0.1910)
= 0:
[finance] (gain: 0.4530)
= 0:
Class 1
= 1:
[children] (gain: 0.4591)
0:
1:
1
= 2:
= 3:
Class 3
Class 3
= 1:
[form] (gain: 0.2011)
= 0:
[children] (gain: 0.9710)
= 0:
Class 1
= 1:
Class 3
= 2:
Class 3
= 1:
Class 3
= 2:
Class 3
=
3:
Class 3
= 2:
[children] (gain: 0.4729)
= 0:

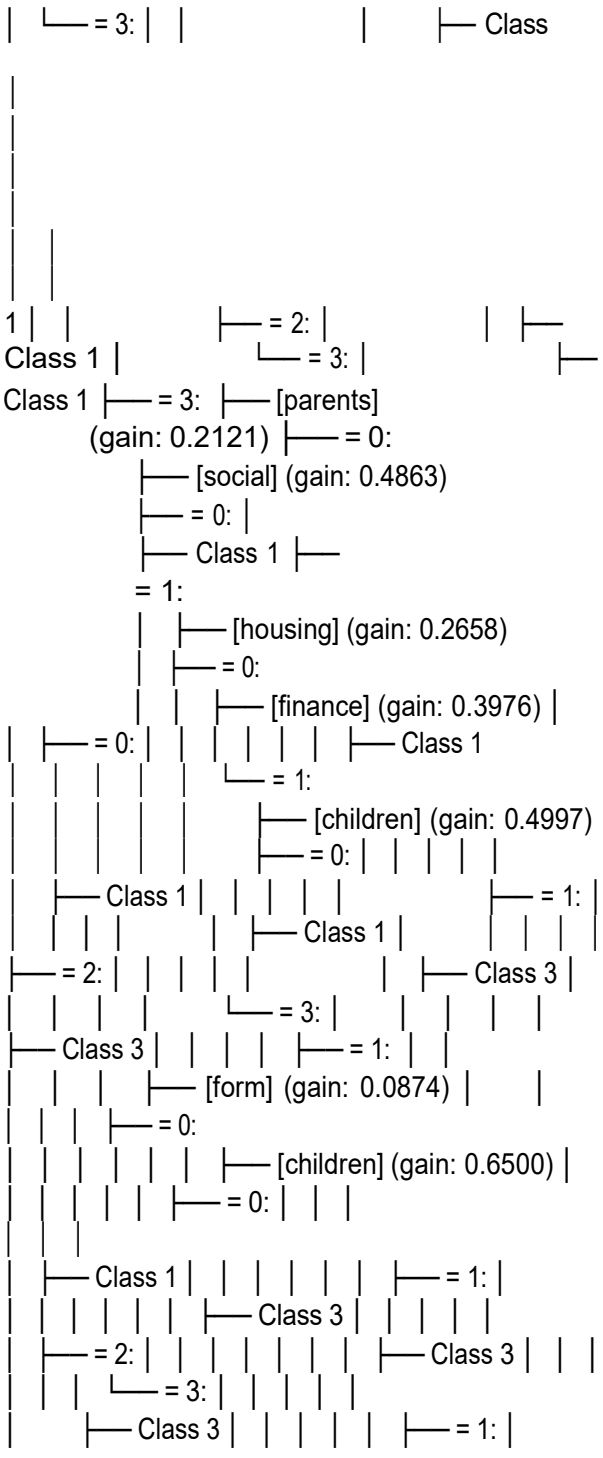

├── =
├── Class 1
=
├── Class
├── [form] (gain: 0.6500)
├── = 0:
├── Class 1
├──
= 1:
├── Class 1
├── = 2:
├── Class 3
└── = 3:
├── Class 1
├── = 1:
├── [form] (gain: 1.0000)
├── = 0:
├── Class
1
├── = 1:
Class 1
├── = 2:
├── Class 3
└── 3:
3
├── = 2:
├── Class 3
└── =
3:
├── Class 3
├── = 1:
├── Class 1
└── = 2:
├── Class 1
└──
= 2:
├── [parents] (gain: 0.1553)
├── = 0:
├── Class
1
├── = 1:
├── [housing] (gain: 0.2299)
├──
= 0:
├── [finance] (gain: 0.4139)
├── = 0:

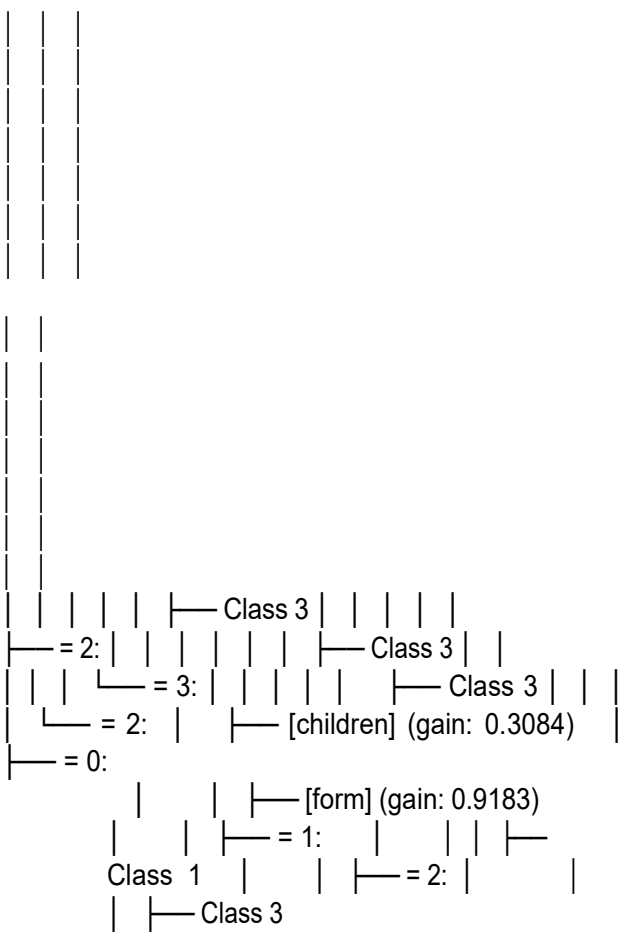

=
Class
Class 4
=
1:
[children] (gain: 0.4997)
= 0:
Class 4
= 1:
Class 4
= 2:
Class 1
= 3:
Class 1
= 1:
[form] (gain: 0.2422)
= 0:
[children] (gain: 1.0000)
= 0:
Class 4
= 2:
Class 1
= 3:
Class 1
= 1:
Class 1
= 2:
Class 1

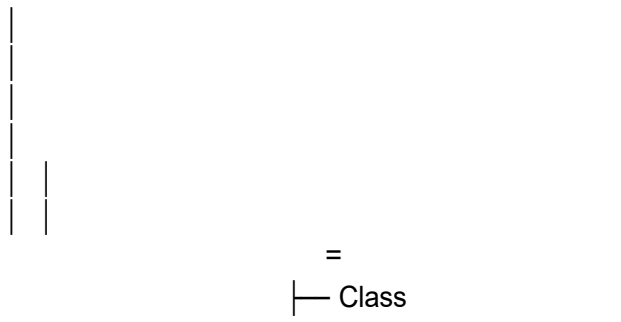


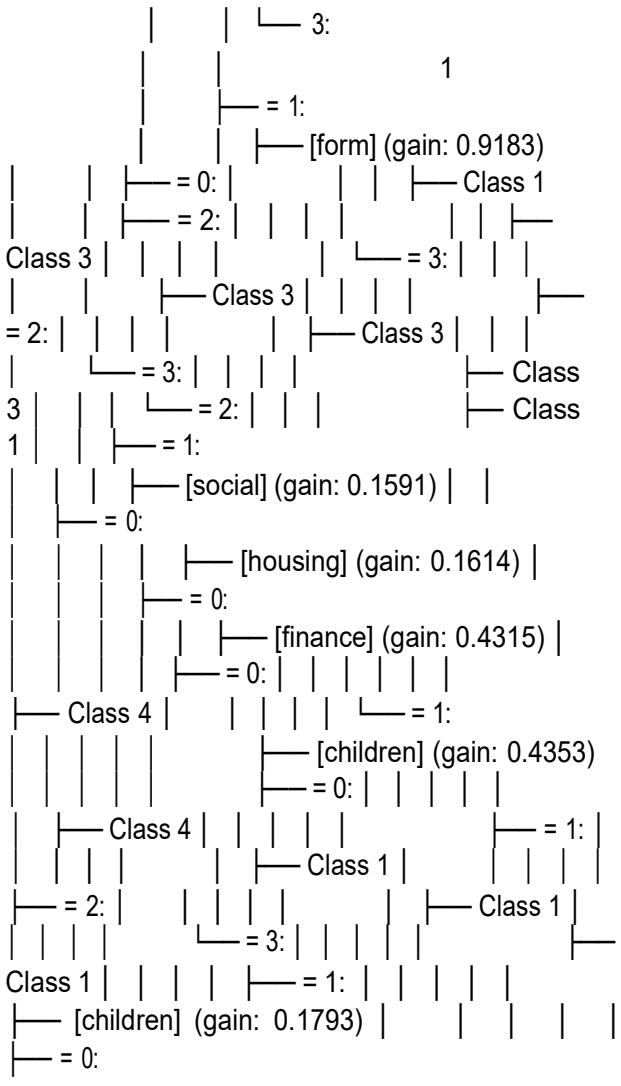

└── = 3:
├── Class 1
└── =
2:
├── [children] (gain: 0.3854)
├── = 0:
├── [form] (gain: 0.9710)
├── = 1:
Class 4
├── = 2:
├── Class 1
└── = 3:
├── Class 4
├── = 1:
├── [form] (gain: 0.9852)
├── = 0:
├── Class 4
├── = 1:
├── Class 4
├── = 2:
├── Class 1
└── = 3:
├── Class 1
├── = 2:
├── Class 1
└── = 3:
├── Class 1
└── = 2:
├── [housing] (gain: 0.1933)
├── = 0:
├── [finance] (gain: 0.3888)
├── = 0:
Class 4
└── = 1:
├── [children] (gain: 0.4039)
├── = 0:
├── Class 4
├── = 1:

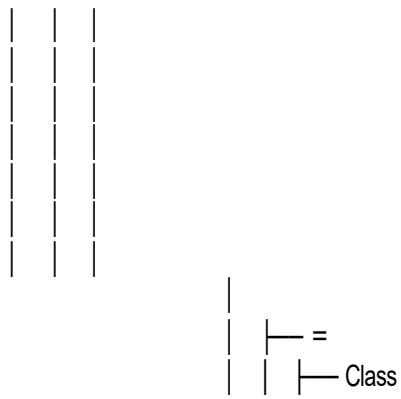

├── Class 1
├── Class 1
├── Class 1
├── [form] (gain: 0.1555)
├── = 0:
├── [children] (gain: 0.8631)
├── = 0:
├── Class 4
├── = 1:
├── Class 1
├── = 2:
Class 1
└── = 3:
├── Class 1
├── = 1:
├── Class 1
├── = 2:
├── Class 1
└── = 3:
= 2:
├── [children] (gain: 0.4323)
├── = 0:
├── [form] (gain: 0.8113)
├── = 0:
├── Class 4
├── = 1:
├── Class 4
├── = 2:
├── Class 1
└── = 3:
├── Class 4
├── = 1:
├── [form] (gain: 0.9183)
├── = 0:
├── Class 4
├── = 2:
├── Class 1

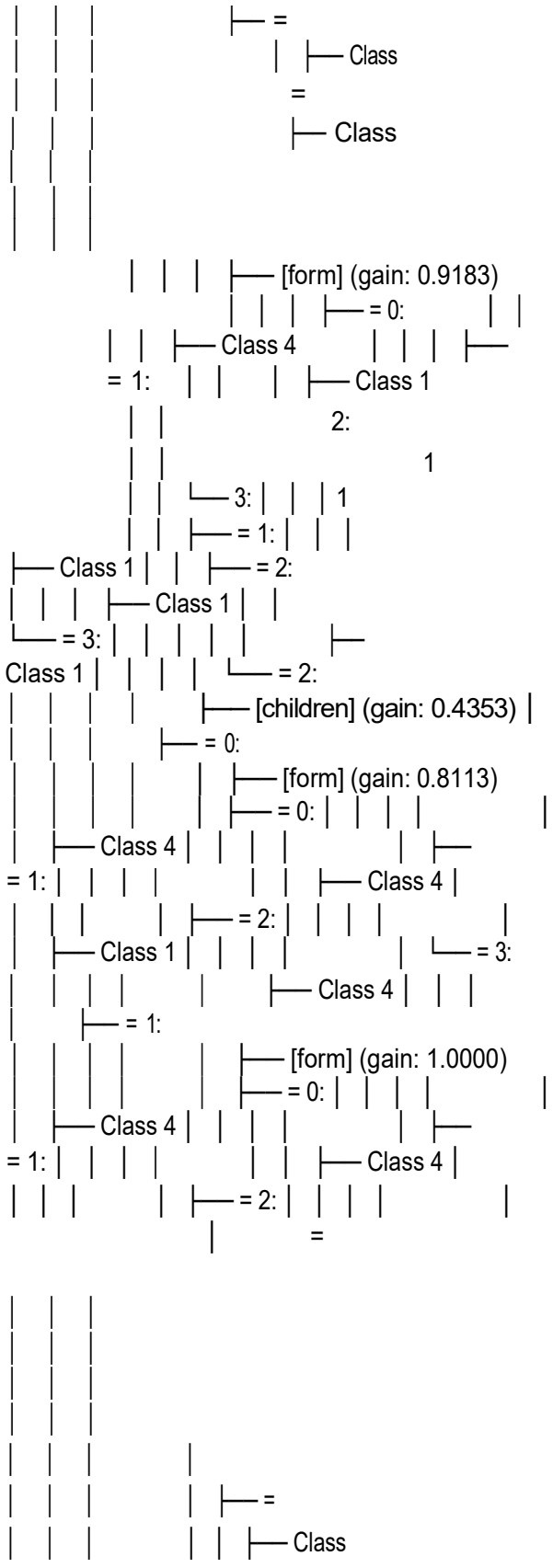

= 3:
Class
= 2:
= 3:
[parents]
(gain: 0.2121)
= 0:
[social] (gain: 0.4863)
= 0:
Class 1
= 1:
[housing] (gain: 0.2658)
= 0:
[finance] (gain: 0.3976)
= 0:
Class 1
= 1:
[children] (gain: 0.4997)
= 0:
Class 1
= 1:
Class 1
= 2:
Class 3
= 3:
Class 3
= 1:
[form] (gain: 0.0874)
= 0:
[children] (gain: 0.6500)
= 0:
Class 1
= 1:
Class 3
= 2:
Class 3
= 3:
Class 3
= 1:

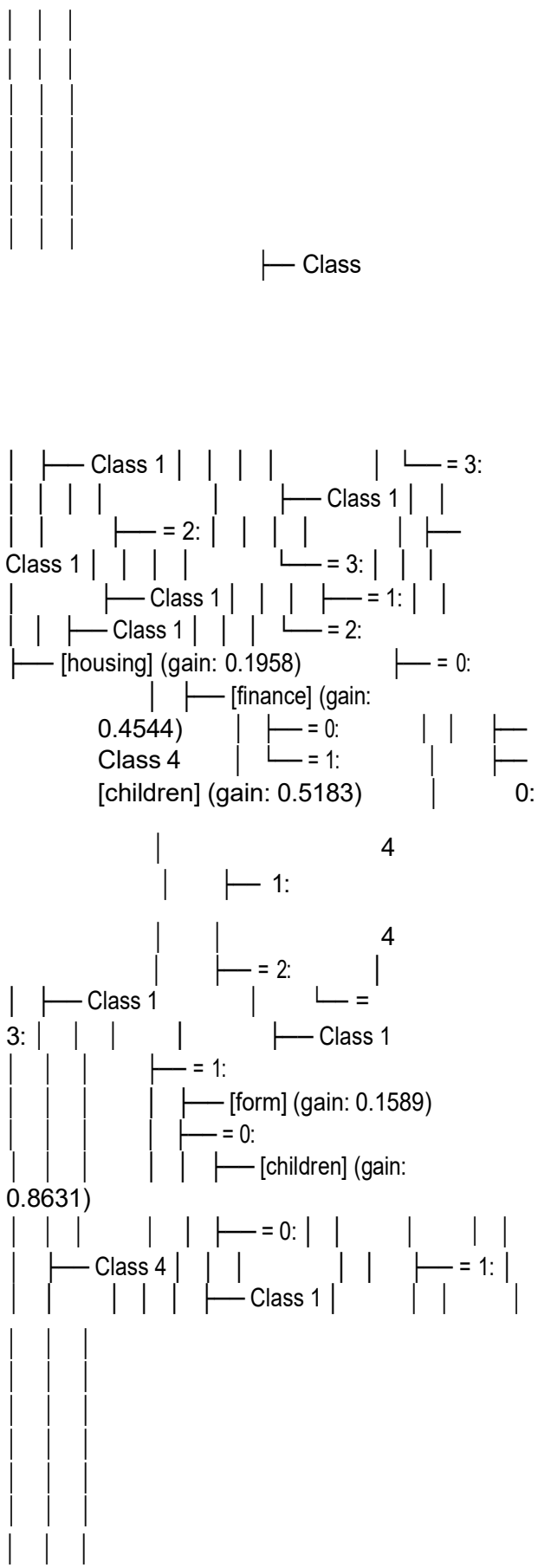

├── Class 3
├── = 2:
├── Class 3
└── = 3:
├── Class 3
└── = 2:
├── [children] (gain: 0.3084)
├── = 0:
├── [form] (gain: 0.9183)
├── = 1:
Class 1
├── = 2:
├── Class 3

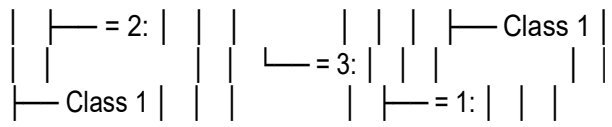

=
├── Class

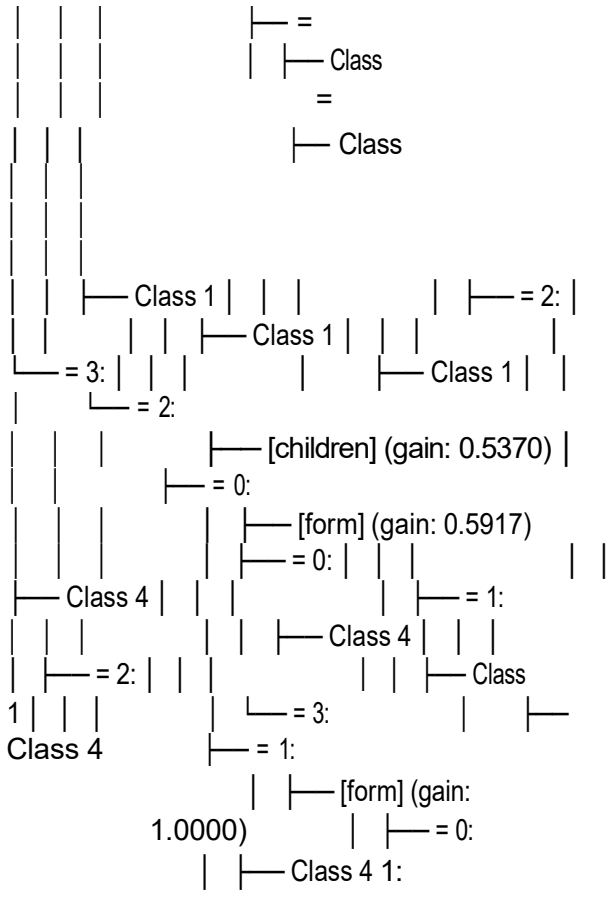

└── 3:
1
├── = 1:
├── [form] (gain: 0.9183)
├── = 0: ├── Class 1
├── = 2: ├── Class 3 ├── = 3: ├── Class 3 ├── = 2: ├── Class 3 ├── = 3: ├── Class 3 ├── = 2: ├── Class 1 ├── = 1:
├── [social] (gain: 0.1591) ├── = 0:
├── [housing] (gain: 0.1614) ├── = 0:
├── [finance] (gain: 0.4315) ├── = 0: ├── Class 4 └── = 1:
├── [children] (gain: 0.4353)
├── = 0: ├── Class 4 ├── = 1: ├── Class 1 ├── = 2: └── = 3: ├── Class 1 ├── Class 1 ├── = 1:
├── [children] (gain: 0.1793) ├── = 0:

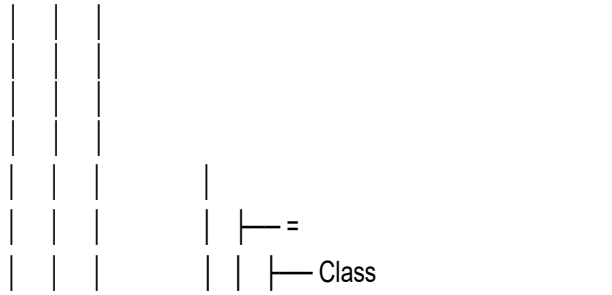

=
Class

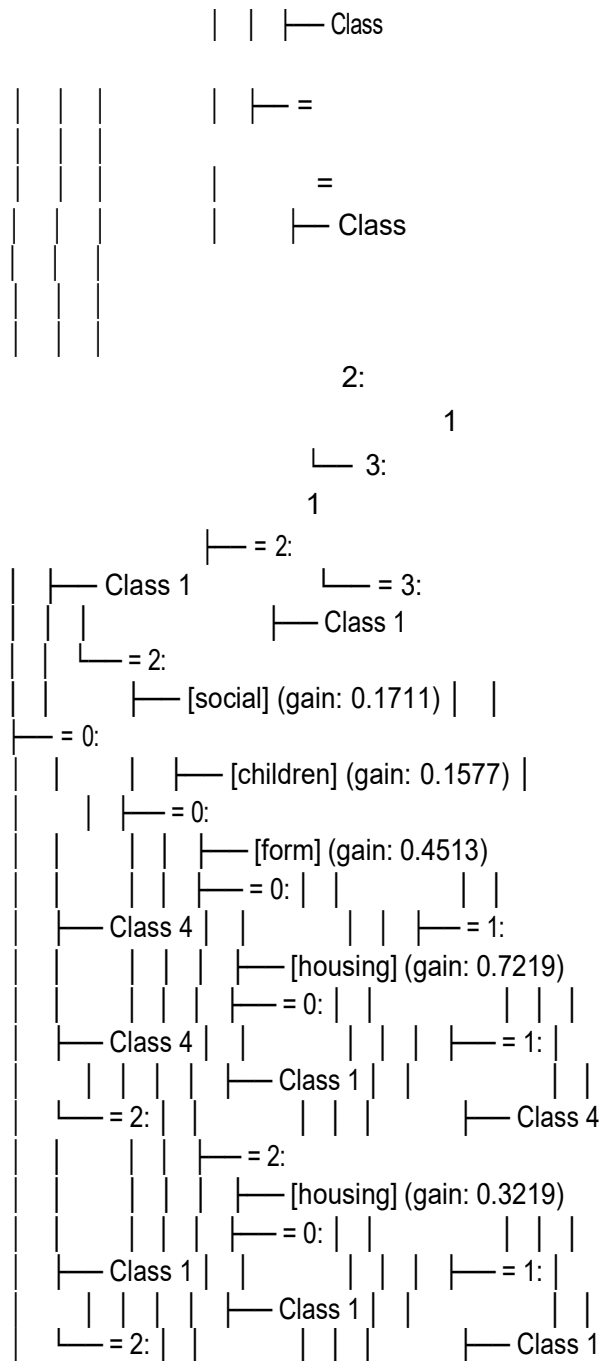

├── =
│ ├── Class
=
├── Class
[form] (gain: 0.9183)
= 0:
Class 4
= 1:
Class 1
2:
1
3:
= 1:
Class 1
= 2:
Class 1
= 3:
Class 1
= 2:
[children] (gain: 0.4353)
= 0:
[form] (gain: 0.8113)
= 0:
Class 4
= 1:
Class 4
= 2:
Class 1
= 3:
Class 4
= 1:
[form] (gain: 1.0000)
= 0:
Class 4
= 1:
= 2:
=
=
Class

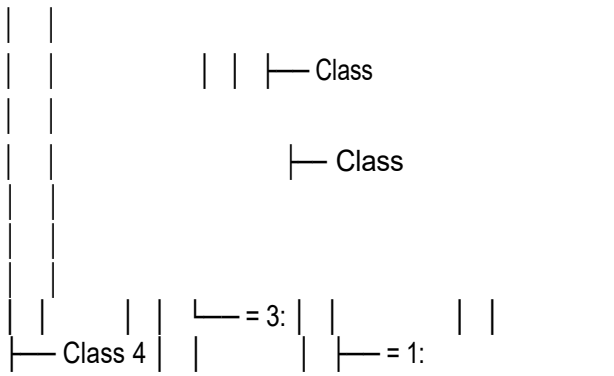

├── Class
├── Class 1
└── = 3:
├── Class 1
├── = 2:
└── = 3:
├── Class 1
├── = 1:
├── Class 1
└── = 2:
├── [housing] (gain: 0.1958)
├── = 0:
├── [finance] (gain: 0.4544)
├── = 0:
└── = 1:
Class 4
[children] (gain: 0.5183)
0:
4
1:
4
2:
Class 1
3:
Class 1
= 1:
[form] (gain: 0.1589)
= 0:
[children] (gain: 0.8631)
= 0:
Class 4
Class 1

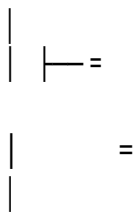

= 2:
Class 1
= 3:
Class 1
= 1:

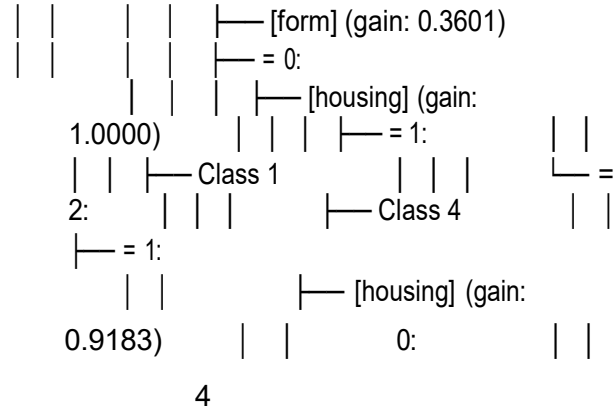

=
Class
=
Class
Class 1
= 2:
Class 1
= 3:
Class 1
= 2:
[children] (gain: 0.5370)
= 0:
[form] (gain: 0.5917)
= 0:
Class 4
= 1:
Class 4
= 2:
Class
1
= 3:
Class 4
= 1:
[form] (gain:
1.0000)
= 0:
Class 4 1:


=
Class

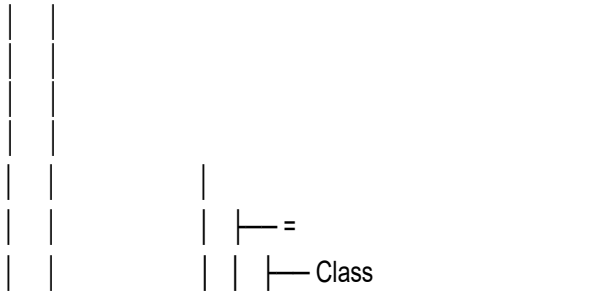

Class
=
Class
2:
1
3:
1
= 2:
Class 1
= 3:
Class 1
= 2:
[social] (gain: 0.1711)
= 0:
[children] (gain: 0.1577)
= 0:
[form] (gain: 0.4513)
= 0:
Class 4
= 1:
[housing] (gain: 0.7219)
= 0:
Class 4
= 1:
Class 1
= 2:
Class 4
= 2:
[housing] (gain: 0.3219)
= 0:
Class 1
= 1:
Class 1
= 2:
Class 1

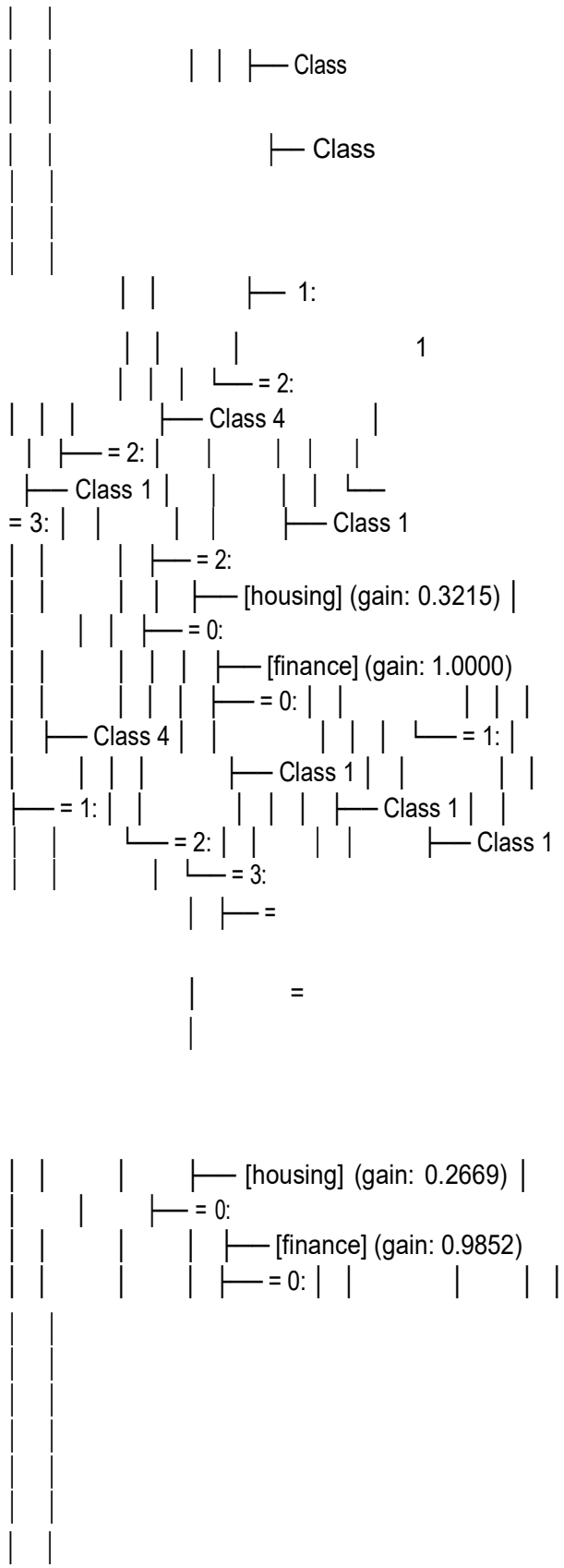

Class
Class
= 3:
Class 4
= 1:

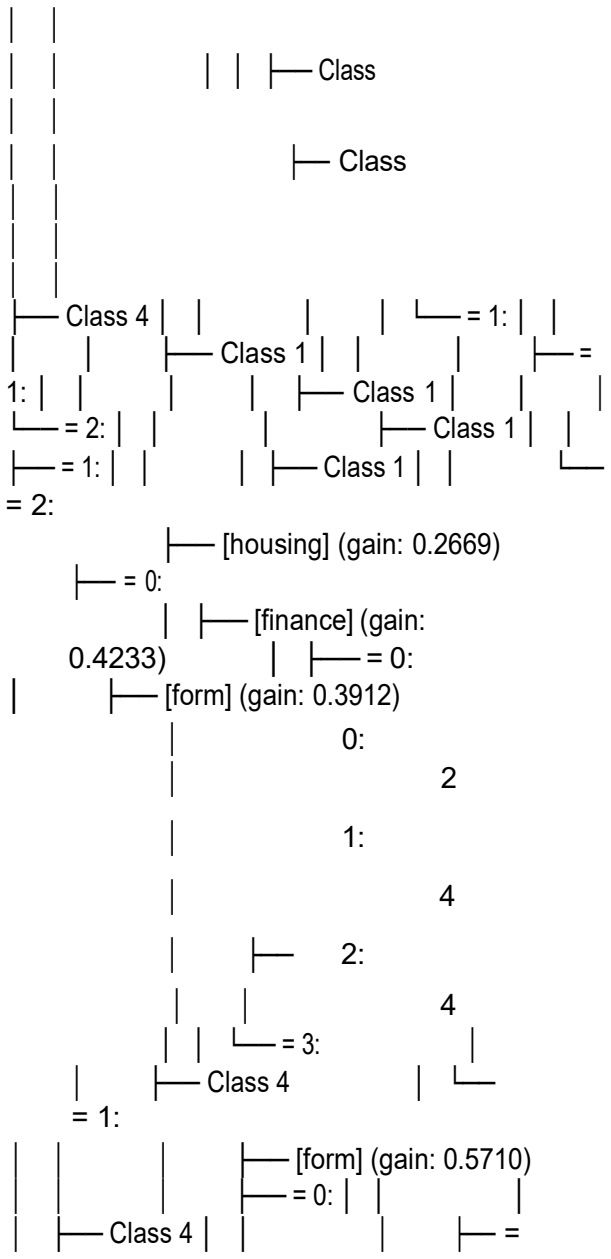

=
=

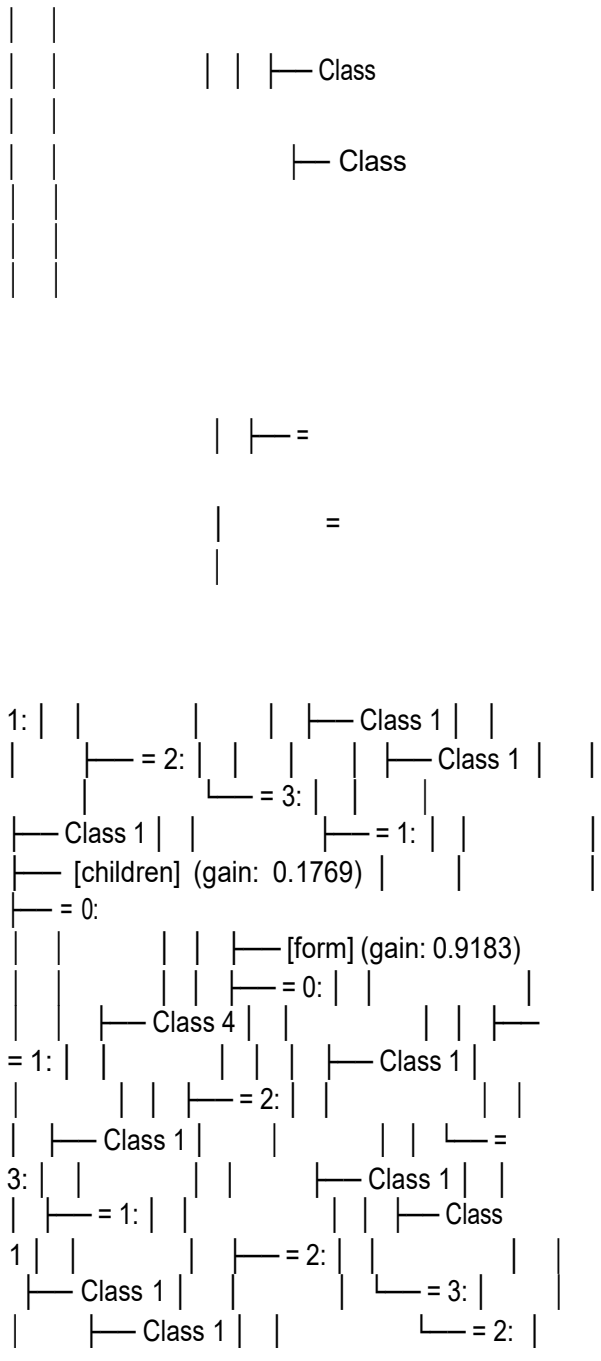

[form] (gain: 0.3601)
= 0:
[housing] (gain:
1.0000)
= 1:
Class 1
=
2:
Class 4
= 1:
[housing] (gain:
0.9183)
0:

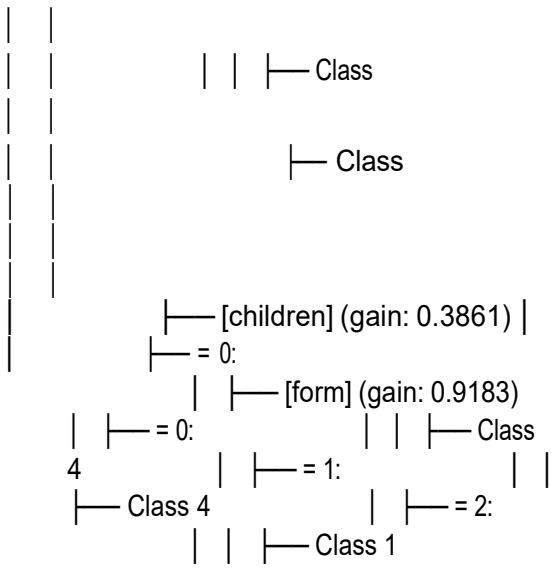
4

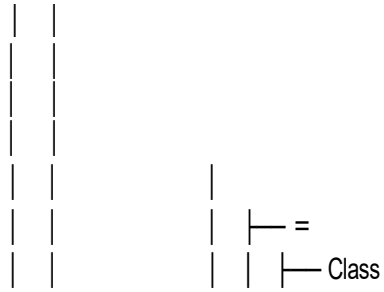

=
Class

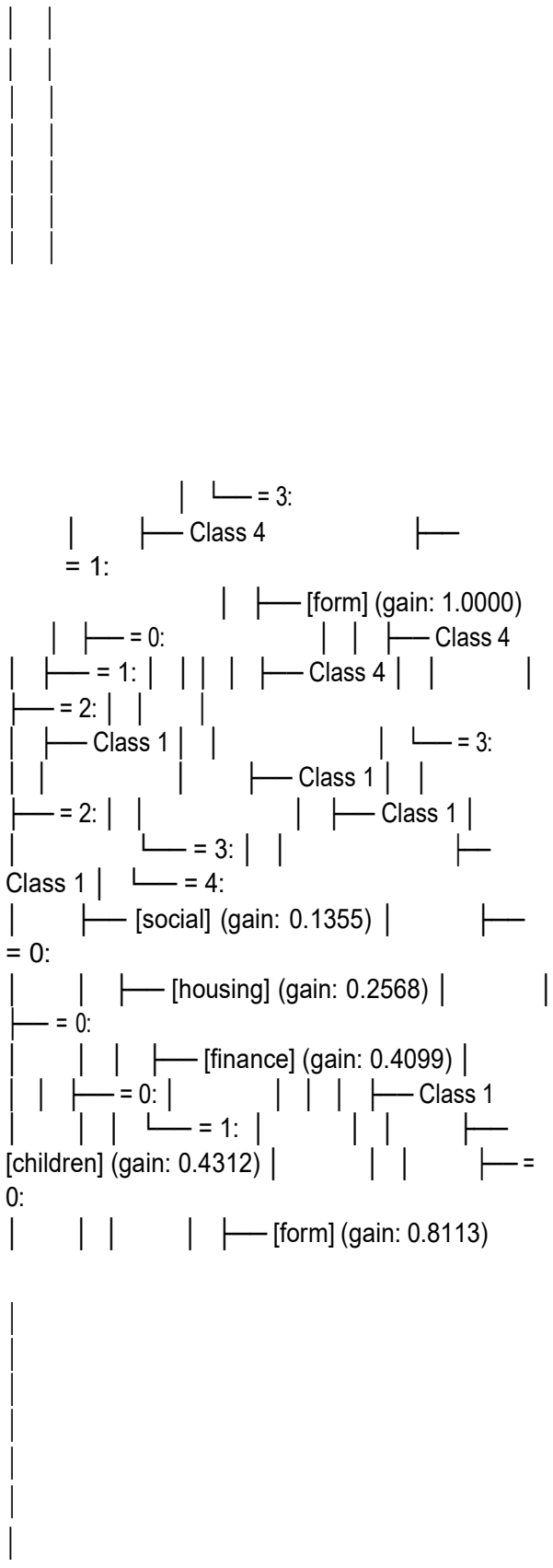

Class
Class
1:
1
= 2:
Class 4
= 2:
Class 1
= 3:
Class 1
= 2:
[housing] (gain: 0.3215)
= 0:
[finance] (gain: 1.0000)
= 0:
Class 4
= 1:
Class 1
Class 1
= 1:
Class 1
= 2:
= 3:
=
=
[housing] (gain: 0.2669)
= 0:
[finance] (gain: 0.9852)
= 0:

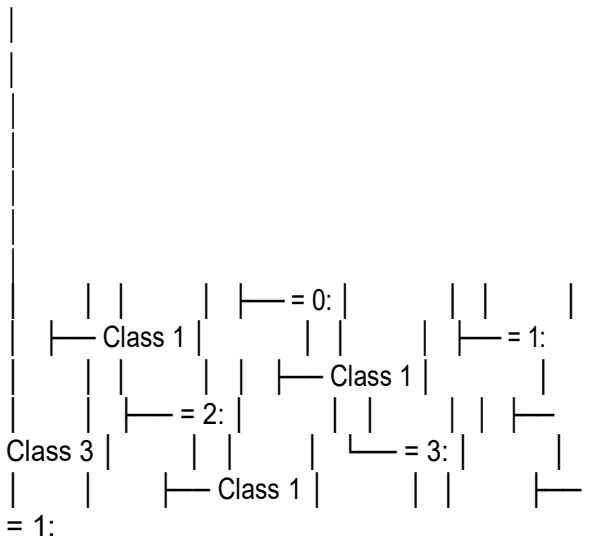

├── Class 4
├── Class 1
├── = 1:
└── = 2:
[housing] (gain: 0.2669)
[finance] (gain: 0.4233)
[form] (gain: 0.3912)
0:
1:
2:
3:
4
Class
[form] (gain: 0.5710)
= 0:
= 1:
= 2:
= 3:

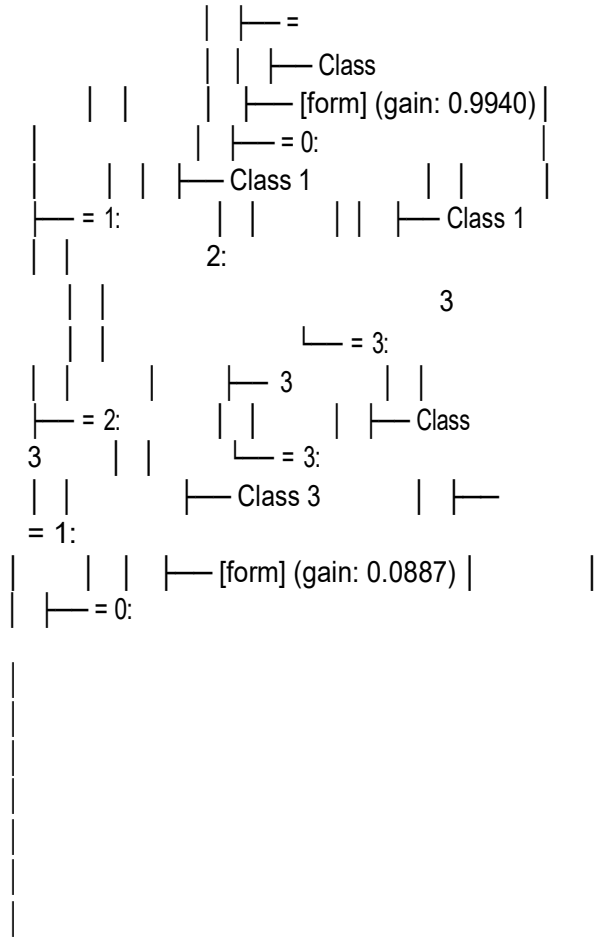

Class
Class
= 2:
= 3:
Class 1
[children] (gain: 0.1769)
= 0:
[form] (gain: 0.9183)
Class 4
= 1:
Class 1
= 2:
Class 1
= 3:
Class 1
= 1:
Class
1
= 2:
Class 1
Class 1
= 2:

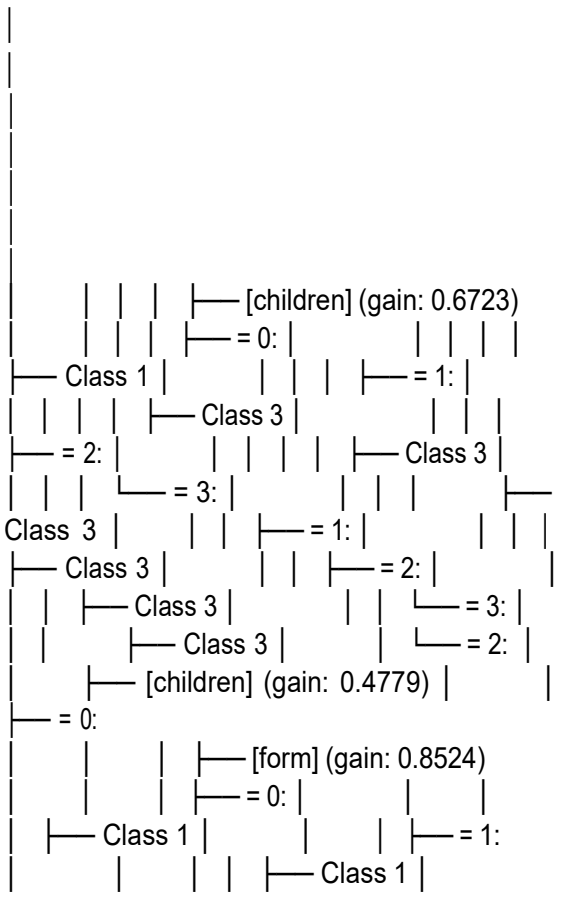

Class
Class
[children] (gain: 0.3861)
= 0:
[form] (gain: 0.9183)
= 0:
Class 4
= 1:
Class 4
= 2:
Class 1


=
Class

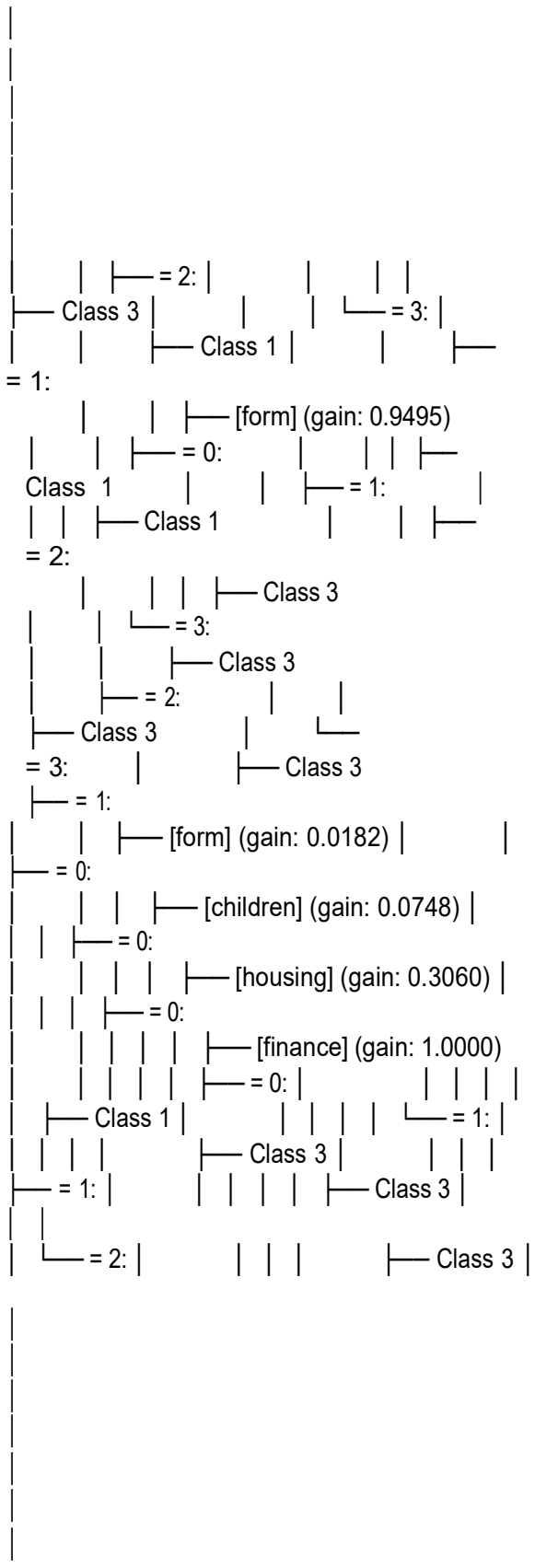

= 3:
Class 4
= 1:
[form] (gain: 1.0000)
= 0:
Class 4
= 1:
Class 4
= 2:
Class 1
= 3:
Class 1
= 2:
Class 1
= 3:
Class 1
= 4:
[social] (gain: 0.1355)
= 0:
[housing] (gain: 0.2568)
= 0:
[finance] (gain: 0.4099)
= 0:
Class 1
= 1:
[children] (gain: 0.4312)
=
0:
[form] (gain: 0.8113)

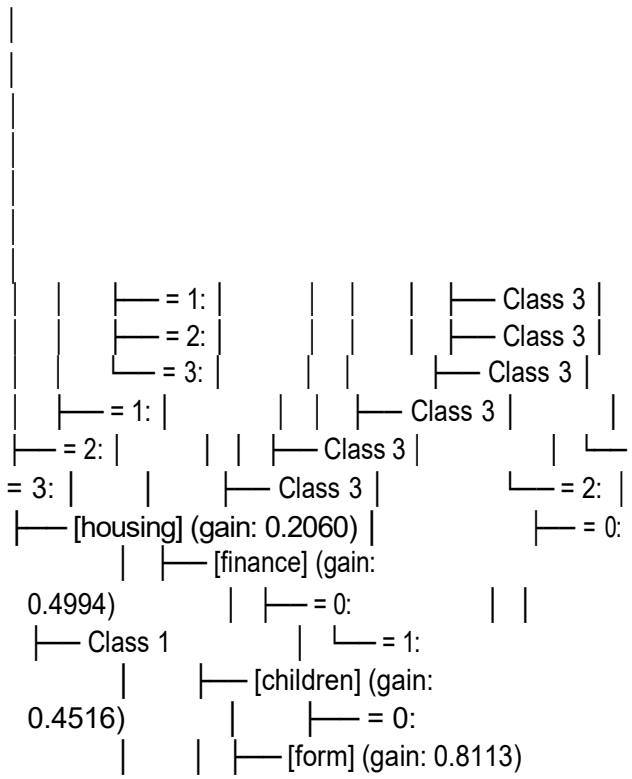

= 0:
Class 1
= 1:
Class 1
= 2:
Class 3
= 3:
Class 1
= 1:

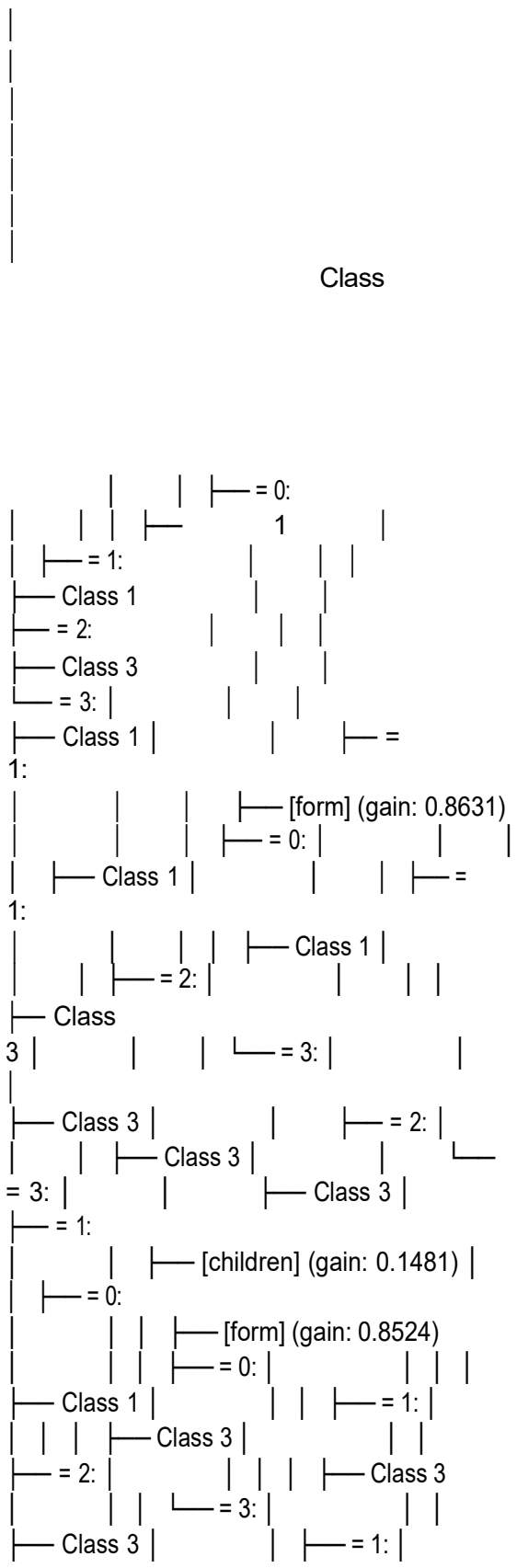

=
Class
[form] (gain: 0.9940)
= 0:
Class 1
= 1:
Class 1
2:
3
= 3:
3
= 2:
Class
3
= 3:
Class 3
= 1:
[form] (gain: 0.0887)
= 0:

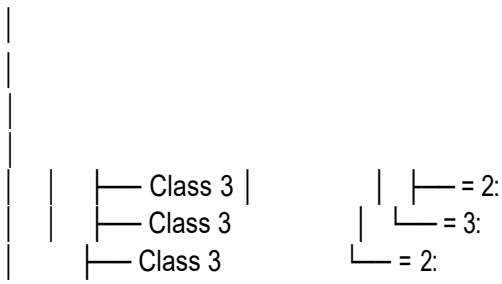

[children] (gain: 0.6723)
= 0:
Class 1
= 1:
Class 3
= 2:
Class 3
= 3:
Class 3
= 1:
Class 3
= 2:
Class 3
Class 3
= 3:
Class 3
= 2:
[children] (gain: 0.4779)
= 0:
[form] (gain: 0.8524)
= 0:
Class 1
= 1:
Class 1

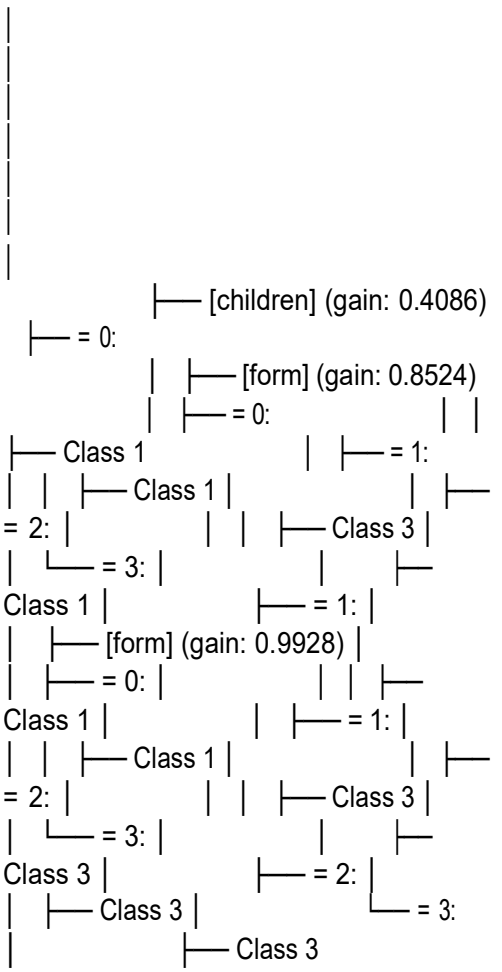
Class


= 2:
Class 3
= 3:
Class 1
= 1:
[form] (gain: 0.9495)
= 0:
Class 1
= 1:
Class 3
= 2:
Class 3
= 3:
Class 3
= 2:
Class 3
= 3:
Class 3
= 1:
[form] (gain: 0.0182)
= 0:
[children] (gain: 0.0748)
= 0:
[housing] (gain: 0.3060)
= 0:
[finance] (gain: 1.0000)
= 0:
Class 1
= 1:
Class 3
= 1:
Class 3
= 2:
Class 3


= 1: Class 3
= 2: Class 3
= 3: Class 3
= 1: Class 3
= 2: Class 3
= 3: Class 3
[housing] (gain: 0.2060)
= 0:
[finance] (gain:
0.4994)
= 0:
Class 1
= 1:
[children] (gain:
0.4516)
= 0:
[form] (gain: 0.8113)


Class
├── = 0:
1
├── = 1:
├── Class 1
├── = 2:
├── Class 3
└── = 3:
├── Class 1
├── =
1:
├── [form] (gain: 0.8631)
├── = 0:
├── Class 1
├── =
1:
├── Class 1
├── = 2:
├── Class
3
├── Class 3
├── = 2:
├── Class 3
└──
= 3:
├── Class 3
├── = 1:
├── [children] (gain: 0.1481)
├── = 0:
├── [form] (gain: 0.8524)
├── = 0:
├── Class 1
├── = 1:
├── Class 3
├── = 2:
├── Class 3
└── = 3:
├── Class 3
├── = 1:


├── Class 3
├── Class 3
└── Class 3
├── = 2:
└── = 3:
└── = 2:


├── [children] (gain: 0.4086)
├── = 0:
├── [form] (gain: 0.8524)
├── = 0:
├── Class 1
├── = 1:
├── Class 1
├── = 2:
├── Class 3
└── = 3:
├── Class 1
├── = 1:
├── [form] (gain: 0.9928)
├── = 0:
├── Class 1
├── = 1:
├── Class 1
├── = 2:
├── Class 3
└── = 3:
├── Class 3
├── = 2:
├── Class 3
└── = 3:
└── Class 3