

MAT 345 - Homework 7
Due Wednesday, November 14, 2018, in class

(5 points). Build a decision tree for following data set with 3 classes. The data set builds a decision tree for fitting contact lenses. Show all your steps.

3 Classes/Labels

- 1 : the patient should be fitted with hard contact lenses,
- 2 : the patient should be fitted with soft contact lenses,
- 3 : the patient should not be fitted with contact lenses.

Attributes:

age of the patient: (1) young, (2) pre-presbyopic, (3) presbyopic

spectacle prescription: (1) myope, (2) hypermetrope

astigmatic: (1) no, (2) yes

tear production rate: (1) reduced, (2) normal

| <i>Age</i> | <i>Prescription</i> | <i>Astigmatic</i> | <i>Tear</i> | <i>Label</i> |
|------------|---------------------|-------------------|-------------|--------------|
| 1 | 1 | 1 | 1 | 3 |
| 1 | 1 | 1 | 2 | 2 |
| 1 | 1 | 2 | 1 | 3 |
| 1 | 1 | 2 | 2 | 1 |
| 1 | 2 | 1 | 1 | 3 |
| 1 | 2 | 1 | 2 | 2 |
| 1 | 2 | 2 | 1 | 3 |
| 1 | 2 | 2 | 2 | 1 |
| 2 | 1 | 1 | 1 | 3 |
| 2 | 1 | 1 | 2 | 2 |
| 2 | 1 | 2 | 1 | 3 |
| 2 | 1 | 2 | 2 | 1 |
| 2 | 2 | 1 | 1 | 3 |
| 2 | 2 | 1 | 2 | 2 |
| 2 | 2 | 2 | 1 | 3 |
| 2 | 2 | 2 | 2 | 3 |
| 3 | 1 | 1 | 1 | 3 |
| 3 | 1 | 1 | 2 | 3 |
| 3 | 1 | 2 | 1 | 3 |
| 3 | 1 | 2 | 2 | 1 |
| 3 | 2 | 1 | 1 | 3 |
| 3 | 2 | 1 | 2 | 2 |
| 3 | 2 | 2 | 1 | 3 |
| 2 | 2 | 1 | 2 | 2 |

To read more about the data set and what each variable encodes, visit the data set repository hosted by University of California Irvine <http://archive.ics.uci.edu/ml/datasets/Lenses>.