

Foundations of Artificial Intelligence

Exercise Sheet 10

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September 23, 2021

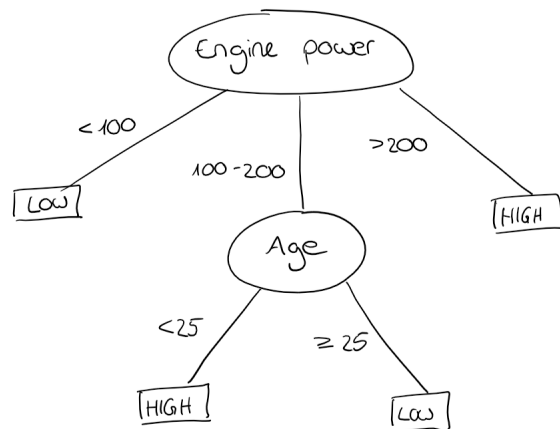
Exercise 10.1

$$R(\text{engine power}) = \frac{2}{6}I(0, \frac{2}{2}) + \frac{2}{6}I(\frac{1}{2}, \frac{1}{2}) + \frac{2}{6}I(\frac{2}{2}, 0) = \frac{1}{3}(0 + 1 + 0) = \frac{1}{3}$$

$$R(\text{age}) = \frac{1}{2}(I(\frac{2}{3}, \frac{1}{3}) + I(\frac{2}{3}, \frac{1}{3})) = \frac{1}{2}(\frac{5}{6} + \frac{5}{6}) = \frac{5}{6}$$

$$\text{Gain}(\text{engine power}) = I(\frac{3}{6}, \frac{3}{6}) - \frac{1}{3} = 1 - \frac{1}{3} = \frac{2}{3}$$

$$\text{Gain}(\text{age}) = I(\frac{3}{6}, \frac{3}{6}) - \frac{5}{6} = 1 - \frac{5}{6} = \frac{1}{6}$$



Exercise 10.2

- (a) training
- (b) training, validation
- (c) validation
- (d) validation, test
- (e) test

The test set should always be fixed a priori, because it defines the desired behaviour of the final model.