Exercise collection – ML Basics

Lecture exercises

Exercise 1:

Identify which type of machine learning (supervised or unsupervised? What type of task?) could be used in these cases:

a) When crossing the alps using the Brenner Autobahn, there is the option to pay electronically in advance. When approaching the toll station, the barrier automatically opens when the number plate was recognised. The recognition happens automatically by a digital camera system.

b) Diagnose whether a patient suffers from cancer or not.

c) The owner of an internet site wants to protect his system against various violations of the terms of service (bot programs, manipulation of timestamps, etc.)

d) An online shopping portal wants to determine products that are automatically offered to registered customers upon login.

e) We want to sort our news into different groups.

f) We want to sort our Email into Spam/Non-Spam.

g) In a supermarket, products that are often bought together are said to be placed side by side on a shelf to increase the sales.

h) We want to extract a list of skills from XING.

i) We want to know our top customers (i. e. highest sales, logistics, etc.).

Solution 1:

a) multiclass classification (plate digits) (supervised learning)

b) binary classification (supervised)

c) outlier detection ((un)supervised)

d) frequent pattern mining (unsupervised)

e) classification (supervised) / clustering (unsupervised)

f) classification (supervised)

g) clustering / assocation rules (unsupervised)

h) not a machine learning task

i) not a machine learning task

Exercise 2:

Identify which type of machine learning (supervised or unsupervised? What type of task?) could be used in these cases:

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