1 Preface

1.1 Standardimporte

```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
```

2 Supervised Learning

2.1 Lineare Regression

Test

```
    import numpy as np

    def incmatrix(genl1,genl2):
        m = len(genl1)
        n = len(genl2)
        M = None #to become the incidence matrix
        VT = np.zeros((n*m,1), int)  #dummy variable

        #compute the bitwise xor matrix
        M1 = bitxormatrix(genl1)
        M2 = np.triu(bitxormatrix(genl2),1)

        for i in range(m-1):
            for j in range(i+1, m):
                [r,c] = np.where(M2 == M1[i,j])
                for k in range(len(r)):
                    VT[(i)*n + r[k]] = 1;
                    VT[(i)*n + c[k]] = 1;
                    VT[(j)*n + r[k]] = 1;
                    VT[(j)*n + c[k]] = 1;

                    if M is None:
                        M = np.copy(VT)
                    else:
                        M = np.concatenate((M, VT), 1)

                    VT = np.zeros((n*m,1), int)

        return M
```

2.2 Logistische Regression

Test

2.3 Support Vector Machines

Test

2.4 K-Nearest Neighbours

Test

2.5 Bayes-Klassifikator

Test

2.6 Entscheidungsbäume

Test

3 Unsupervised Learning

3.1 K-Means Clustering

Test

3.2 Hierarchisches Clustering

Test

3.3 Assoziationsregeln

Test

3.4 Anomalieerkennung

Test

3.5 Hauptkomponentenanalyse/Principal Component Analysis (PCA)

Test

4 Reinforcement Learning

4.1 Markov-Entscheidungsprozesse

Test

4.2 Passives Reinforcement-Learning

Test

4.3 Aktives Reinforcement-Learning

Test

5 Deep Learning

5.1 Künstliche Neuronale Netze

Test

5.2 Convolutional Neutral Networks

Test

5.3 Recurrent Neutral Networks

Test

5.4 Recurrent Neutral Networks

Test