Machine Learning Exercise 6

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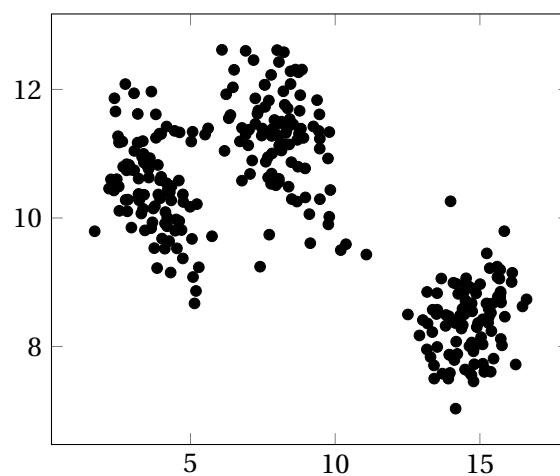Universität Hamburg — January 16, 2020

1 Plots

Figure 1: unclassified cloud of points
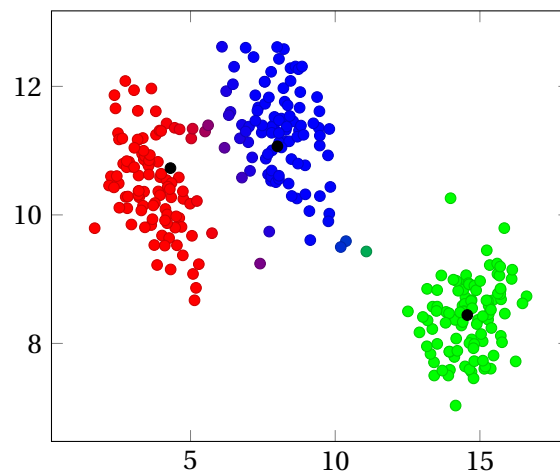

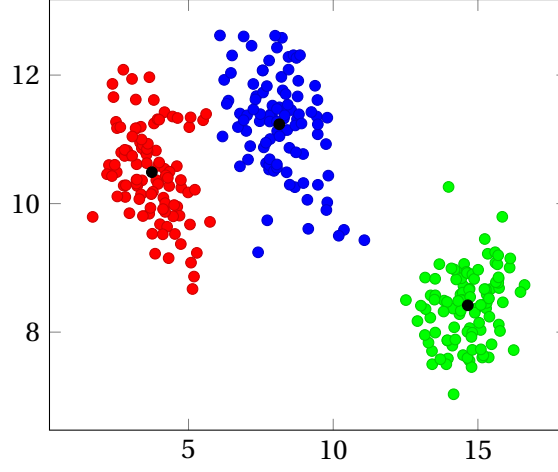Figure 2: cloud of points classified via EM, means in black

Figure 3: cloud of points classified via K-Means(K=3), centroids in black

2 Models

2.1 K-Means Cendroids

$$C_1 = \begin{pmatrix} 3.7326 \\ 10.4895 \end{pmatrix} \qquad C_2 = \begin{pmatrix} 8.1369 \\ 11.2347 \end{pmatrix} \qquad C_3 = \begin{pmatrix} 14.6516 \\ 8.4175 \end{pmatrix}$$

2.2 Mixture of Gaussian parameters

$$\phi_1 = 0.38585 \qquad \Sigma_1 = \begin{pmatrix} 2.65818 & 0.35741 \\ 0.35741 & 0.45157 \end{pmatrix} \qquad \mu_1 = \begin{pmatrix} 4.30673 \\ 10.72801 \end{pmatrix}$$

$$\phi_2 = 0.27364 \qquad \Sigma_2 = \begin{pmatrix} 1.60402 & 0.30605 \\ 0.30605 & 0.89519 \end{pmatrix} \qquad \mu_2 = \begin{pmatrix} 8.00213 \\ 11.06764 \end{pmatrix}$$

$$\phi_3 = 0.34050 \qquad \Sigma_3 = \begin{pmatrix} 1.08411 & 0.01172 \\ 0.01172 & 0.33095 \end{pmatrix} \qquad \mu_3 = \begin{pmatrix} 14.56538 \\ 8.44124 \end{pmatrix}$$