technische universität
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Dept. of Computer Science
Chair of Algorithm Engineering

Tutorial for

Introduction to Computational Intelligence in Winter 2009/10

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Sheet 1, Block A

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Exercise 1.1: McCulloch-Pitts Neural Net (5 Points)
Give for each of the Boolean functions a McCulloch-Pitts ANN that solves it.

a) $f(x) = x_1\bar{x}_2\bar{x}_3 \vee \bar{x}_1x_3 \vee x_1x_4$.

b) $g(x) = (x_1 \vee x_2) \wedge \bar{x}_3 \vee (x_2x_3) \wedge (x_4x_5)$.

Exercise 1.2: Percetron Classifier (5 Points)
A class $C \subset R^2$ contains all points in the quadrangle with the vertices $(2, 0)$, $(0, 0.5)$, $(-2, 0)$, and $(0, -0.5)$. Construct an ANN with perceptrons that can decide whether an input vector (x, y) is inside the quadrangle or not. Give the net and describe the construction, especially the calculation of the weight vectors.