CS540 Section 3 HW4 04/16/2015

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P1.

(a) i. i_1 output: $1\times(-0.5)+1\times 2=1.5$

$$g(1.5)=\frac{1}{1+e^{-1.5}}=0.818$$

i_2 output: $1\times 1.5+1\times(-3.5)=-2$

$$g(-2)=\frac{1}{1+e^{2}}=0.119$$

o output: $1\times 0.5+0.818\times(-1.5)+0.119\times 2.5=-0.430$

$$g(-0.430)=\frac{1}{1+e^{0.430}}=0.394$$

ii. $\alpha=0.1, x_1=0, x_2=1, O=0.394, T=1$

$$T-O=1-O=0.606$$

Hidden to output:

$$\Delta w_{i1,o}=\alpha\times i_1\times(T-O)\times O\times(1-O)=0.0118$$

$$\Delta w_{i2,o}=\alpha\times i_2\times(T-O)\times O\times(1-O)=0.0017$$

$$\Delta w_{b,o}=\alpha\times 1\times(T-O)\times O\times(1-O)=0.0144$$

Updated weight:

$$w'_{i1,o}=w_{i1,o}+\Delta w_{i1,o}=-1.5+0.0118=-1.4882$$

$$w'_{i2,o}=w_{i2,o}+\Delta w_{i2,o}=2.5+0.0017=2.5017$$

$$w'_{b,o}=w_{b,o}+\Delta w_{b,o}=0.5+0.0144=0.5144$$

(b)