Date: No.:

1. $\frac{d}{dz}\frac{1}{1+e^{-z}} = -(1+e^{-z})^{-2}\times(-e)^{-z}$

$= \frac{e^{-z}}{(1+e^{-z})^2} = \frac{1+e^{-z}-1}{(1+e^{-z})^2} = \frac{1}{(1+e^{-z})} - \frac{1}{(1+e^{-z})^2} = \frac{1}{1+e^{-z}}\left(1-\frac{1}{1+e^{-z}}\right)$

$= \sigma(z)(1-\sigma(z))$

2. $W_{11}=0.5$, $W_{12}=-0.6$, $b=0.2$

x_1	x_2	y
0	1	0
0	0	1
1	1	1
1	0	1

① $0.5\times0+(-0.6)\times1+0.2=-0.4$

② $0.5\times0+(-0.6)\times0+0.2=0.2$

③ $0.5\times1+(-0.6)\times1+0.2=0.1$

④ $0.5\times1+(-0.6)\times0+0.2=0.7$

2-2 $\eta=0.05$로 설정

$b=0.2+0.05\times(-0)\cdot1=0.25$

$W_{11}=0.5+0.05\times(-0)\cdot1=0.55$

$W_{12}=(-0.6)+0.05\times(-0)\cdot1=-0.55$

재분류

① (0,1) $-0.55+0.2=-0.35$ $\varphi(-0.35)=0$

(0,0) 0.25 $\varphi(0.25)=1$

(1,1) $0.55-0.55+0.25$ $\varphi(0.25)=1$

(1,0) $0.55+0.25=0.75$ $\varphi(0.75)=1$

∴ 업데이트 XX

3. 입력층부터 전방향으로 ①~⑧

① $z_1^{(2)}=0.5\times0.1+0.5\times0.2$ $z_1^{(2)}=0.15$

$=0.05+0.1=0.15$

② $a_1^{(2)}=\frac{1}{1+e^{-0.15}}=0.54$

③ $z_1^{(3)}=0.54\times0.4+0.54\times0.15=0.3$

④ $a_1^{(3)}=0.57$

⑤ $z_2^{(2)}=0.3\times0.4+0.3\times0.2=0.18$

⑥ $a_2^{(2)}=0.54$

⑦ $z_2^{(3)}=0.54\times0.45+0.54\times0.35=0.43$

⑧ $a_2^{(3)}=0.61$

3-2. $J_1=\frac{1}{2}(0.57-0.5)^2=0.00245$

$J_2=\frac{1}{2}(0.61-0.8)^2=0.01805$