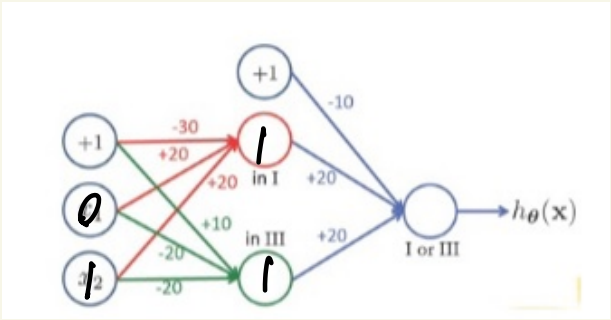
HW7

1.



for $x_1 = x_2 = 0$:

$z_1 = 0 \cdot 20 + 0 \cdot 20 + 1 \cdot (-30) = -30$

$G(-30) = \frac{1}{1 + e^{30}} \approx 0$

$z_2 = 10$

$G(10) = \frac{1}{1 + e^{10}} \approx 1$

$z_3 = 1 \cdot 20 + 0 \cdot 20 - 10 = 10$

$h_\theta(x) = G(10) \approx 1$

for $x_1 = 0$, $x_2 = 1$

$z_1 = 1 \cdot (-30) + 1 \cdot 20 = -10$

$G(-10) = \frac{1}{1 + e^{10}} \approx 1$

$z_2 = 1 \cdot 10 + 0 \cdot (-20) + 1 \cdot (-20) = -10$

$G(-10) \approx 1$

$z_3 = 1 \cdot (-10) + 1 \cdot 20 + 1 \cdot 20 = 30$

$h_\theta(x) = G(30) \approx 0$

for $x_1 = 1$ $x_2 = 0$

$z_1 = 1 \cdot (-30) + 1 \cdot 20 = -10$

$G(-10) = \frac{1}{1 + e^{10}} \approx 1$

$z_2 = 1 \cdot 10 + 0 \cdot (-20) + 1 \cdot (-20) = -10$

$G(-10) \approx 1$

$z_3 = 1 \cdot (-10) + 1 \cdot 20 + 1 \cdot 20 = 30$

$h_\theta(x) = G(30) \approx 0$

for $x_1 = x_2 = 1$

$z_1 = -30 + 20 + 20 = 10$

$G(10) \approx 1$

$z_2 = 10 - 20 - 20 = -30$

$G(-30) \approx 0$

$z_3 = -10 + 20 = 10$

$G(10) \approx 1$

$h_\theta(x) \approx G(1) \approx 1$