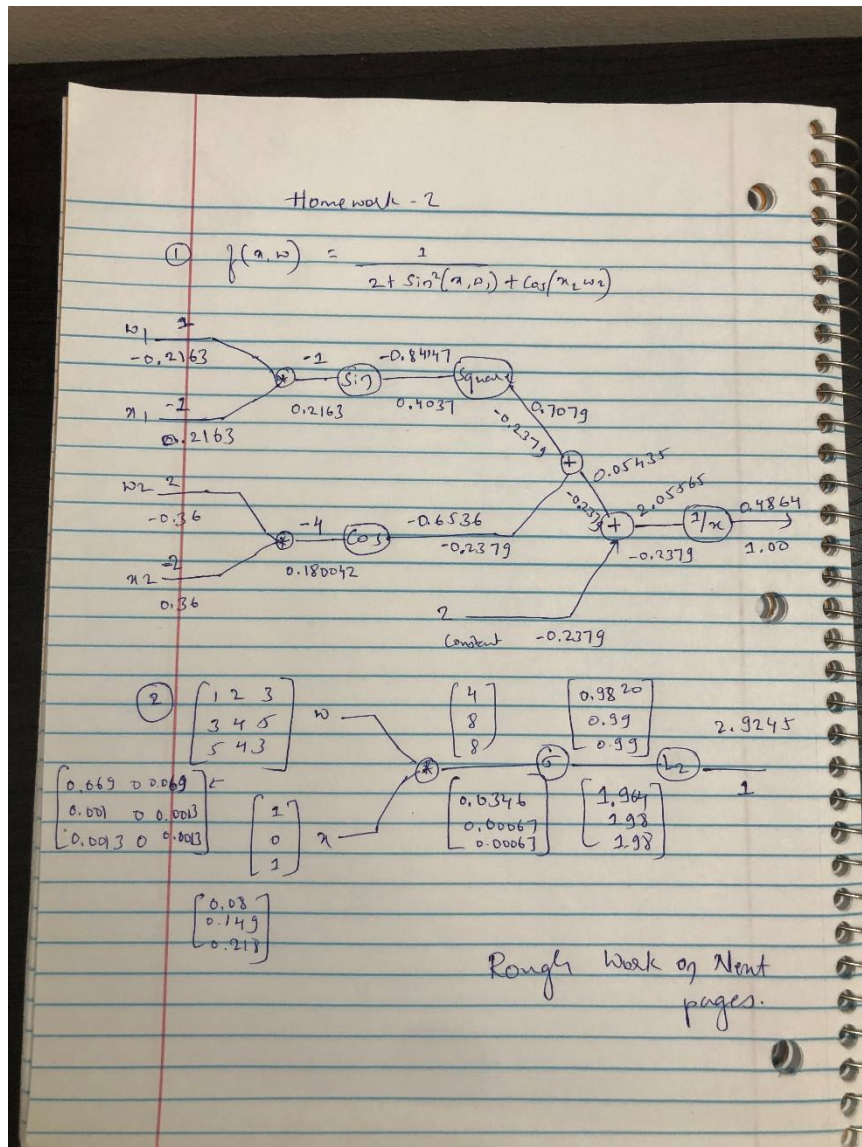


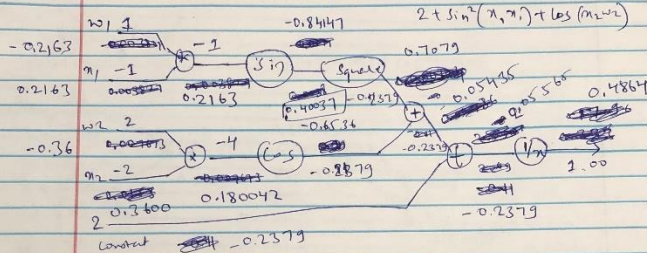
Homework 2

Swapnil Shashikant Kamate

Main work and rough work



$$f(n, \omega) = \frac{1}{2 + \sin^2(\pi_1 \pi_1) + \cos(\pi_2 \omega_2)}$$



$$(1.0) \cdot -1 \Rightarrow -0.1172 \times -0.0174$$

$$\frac{d(\sin)}{dn} = \cos \Rightarrow 0.003827$$

$$\frac{d(\cos)}{dn} = -\sin \Rightarrow -0.011 - \sin(-4) \Rightarrow -0.007673$$

$$-0.2379, 2.08447 \Rightarrow \frac{(-1)}{(2.0)^2}$$

$$0.40037 \cdot \cos(-1)$$

$$0.2379 \cdot \sin(-4)$$

$$0.40037 \times 0.54030 \rightarrow \cos$$

$$0.2379 \cdot 0.75680 \rightarrow \sin$$

$$\frac{1}{1+e^{-x}}$$

$$\begin{bmatrix} 1 \\ 0 \\ 1 \end{bmatrix}$$

$$3+5$$

$$5+3$$

$$\begin{array}{c}
 0.69 \quad 0. \\
 \begin{bmatrix} 1 & 2 & 3 \\ 3 & 4 & 5 \\ 5 & 4 & 3 \end{bmatrix} \xrightarrow{\omega} \begin{bmatrix} 4 \\ 8 \\ 8 \end{bmatrix} \xrightarrow{\otimes} \begin{bmatrix} 0.9820 \\ 0.99 \\ 0.99 \end{bmatrix} \xrightarrow{1.2} 2.5245 \\
 \begin{bmatrix} 1 \\ 0 \\ 1 \end{bmatrix} \xrightarrow{\times} \begin{bmatrix} 0.0346 \\ 0.00861 \\ 0.00261 \end{bmatrix} \xrightarrow{\otimes} \begin{bmatrix} 1.9647 \\ 1.98 \\ 1.98 \end{bmatrix} \xrightarrow{2} 7 \\
 \begin{array}{c} 0.08 \\ 0.149 \\ 0.218 \end{array} \quad 1
 \end{array}$$

$$\begin{array}{c}
 0^T = \begin{bmatrix} 0.5643 \\ 0.9801 \\ 0.9801 \end{bmatrix} \\
 1+e
 \end{array}$$

$$1.2 = 2 \cdot (1.2) \quad \nabla_{\theta} J = 2q$$

$$(1 - e^{(n)}) e^{(n)} \begin{bmatrix} 1.9647 \\ 1.98 \\ 1.98 \end{bmatrix} \otimes \begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix} \xrightarrow{\otimes} \begin{bmatrix} 0.9820 & 0.9820 \\ 0.99 & 0.99 \\ 0.99 & 0.99 \end{bmatrix}$$

$$\nabla_{\theta} J \approx 2q \cdot x^T$$

$$\begin{bmatrix} 0.018 \\ 0.01 \\ 0.01 \end{bmatrix} \begin{bmatrix} 0.9820 \\ 0.99 \\ 0.99 \end{bmatrix}$$

Output Screenshot

```
Command Prompt

C:\Users\Swapnil\Desktop>python q1.py
Forward propagation values are:
1 -1 -1 -0.8414709848078965 0.7080734182735712 2 -2 -4 -0.6536436208636119 0.054429797409959235 2.0544297974099592 0.48675306465117973

Back propagation values are :
0.358616722956521505 -0.35861622956521505 0.21543851717144435 -0.21543851717144435 0.17930811478260753 0.21543851717144435 0.39873699377478117 -0.23692854594731555 -0.23692854594731555 -0.23692854594731555 -0.23692854594731555 1

C:\Users\Swapnil\Desktop>python q2.py
FORWARD PROPOGATION
[array([[4],
       [0],
       [8]]), array([[0.98201379],
                    [0.99966465],
                    [0.99966465]]), 2.963009988222172]

BACKWARD PROPOGATION
[1.96402758]
[1.9993293]
[1.9993293]

[0.03469004]
[0.00067025]
[0.00067025]

[0.08010409]
[0.14948418]
[0.21886426]

[0.06938008 0.06938008]
[0.0013405 0.0013405]
[0.0013405 0.0013405]
```