DATE: __/__/2021

Part #2:-

(0,0,1)

forward propagation.

$n_1 = G[x_1 w_1 + x_2 w_3 + b_1]$.

0,0,1 → G(0.1) = 0.0996

1,0,0 → G(0.2) = 0.19737

0,1,0 → G(0.2) = 0.19737

1,1,1 → G(0.3) = 0.2913

$n_2 = G[x_1 w_2 + x_2 w_4 + b_2]$

0,0,1 → G(0.1) = 0.099

1,0,0 → G(0.2) = 0.19737

0,1,0 → G(0.2) = 0.197

1,1,1 → G(0.3) = 0.2913

$yHAT = G[n_1 w_5 + n_2 w_6 + b_3]$

0,0,1 → G(0.1199336) = 0.1193

1,0,0 → G(0.1394506) = 0.1385

0,1,0 → G(0.13946) = 0.3856

1,1,1 → G(0.1582625) = 0.1569

(0,0,1)

$= \frac{1}{2}(1 - 0.91936185)^2$.

$= 0.3877617756$.

(1,0,0)

$= \frac{1}{2}(1 - 0.13857763)^2 \Rightarrow 0.37102424$.

(0,1,0)

$= \frac{1}{2}(0 - 0.3856286)^2$

$= 0.07435470857$.

(1,1,1)

$= \frac{1}{2}(1 - 0.1569543)^2$.

$= 0.3553630261$.

$\delta_{yHAT} = yHAT(1 - yHAT)(t_{yHAT} - yHAT)$.

$= 0.11936185(1 - 0.11936185)(1 - 0.11936185)$

$= 0.11936185(0.88063815)(0.88063815)$

$= 0.092567925$

$\delta n_1 = n_1(1 - n_1)w_5 + \delta yHAT$.

$= (0.099668)(0.900332)(0.1) + 0.092567925$

$= 0.101541354$.

$\delta n_2 = n_2(1 - n_2)w_6 + \delta yHAT$.

$= (0.099668)(0.900332)(0.1) + 0.092567925)$

$= 0.101541354$.

DATE: __/__/2021

$w_1 = \Delta w_1 + w_1$

$\Delta w_1 = \eta \delta n_1 x_1 = (0.5)(0.161541354)(0) = 0$

$w_1 = 0 + 0.1 \Rightarrow \boxed{0.1 = w_1}$

$w_2 = \Delta w_2 + w_2$

$\Delta w_2 = \eta \delta n_2 x_2 = (0.5)(0.101541354)(0) = 0$

$w_2 = 0 + 0.1 \Rightarrow \boxed{w_2 = 0.1}$

$w_3 = \Delta w_3 + w_3$

$\Delta w_3 = \eta \delta n_3 x_3 = 0$

$w_3 = 0 + 0.1 \Rightarrow \boxed{w_3 = 0.1}$

$w_4 = \Delta w_4 + w_4$

$\Delta w_4 = \eta \delta n_4 x_4 = 0.$

$w_4 = \Delta w_4 + w_4 = 0 + 0.1 = \boxed{0.1 = w_4}$

$w_5 = w_5 + \Delta w_5$

$\Delta w_5 = \eta \delta y_{HAT} . n_3 = (0.5)(0.092567925)(0.099668)$

$= 0.004613029$

$w_5 = 0.1 + 0.004613029 \Rightarrow \boxed{w_5 = 0.104613029}$

$w_6 = \Delta w_6 + w_6$

$\Delta w_6 = 0.004613029$

$\boxed{w_6 = 0.104613029.}$

Iteration #02.

(0, 0, 1)

$n_1 = 0.099668$

$n_2 = 0.099668$

$y_{HAT} = 0.17077132$

DATE: __/__/2021

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(1,0,0)

$n_1 = 0.197375$

$n_2 = 0.197375$

$y_{HAT} = 0.14036844$

(0,1,0)

$n_1 = 0.197375$

$n_2 = 0.197375$

$y_{HAT} = 0.14130194$

(1,1,1)

$n_1 = 0.2913126$

$n_2 = 0.2913126$

$y_{HAT} = 0.1595831$

Error Computation:

$(0,0,1) \rightarrow \frac{1}{2}(1-0.1202)^2 = 0.38696$

$(1,0,0) \rightarrow \frac{1}{2}(0-0.14013)^2 = 0.009818$

$(0,1,0) \rightarrow \frac{1}{2}(0-0.14013)^2 = 0.009818$

$(1,1,1) \rightarrow \frac{1}{2}(1-0.159831)^2 = 0.3529$

Back Propagation.

$\delta y_{HAT} = 0.093080688672$

$\delta n_1 = 0.000835$

$\delta n_2 = 0.000835$

updating weights:-

$w_1 = 0.1$, $w_2 = 0.1$

$w_3 = 0.1$, $w_4 = 0.1$.

$w_5 = 0.1092516129$.

$w_6 = 0.1092516129$.