Data Mining

Name: Nimra Amer **ROLL-NO:** 21L-5609
Section: BDS-6A

HOME-WORK#2

Question NO.1:

(1)

$$MSE = \frac{1}{n}\sum_{i=1}^{n}(\hat{y}_i - y_i)^2 \quad \because n = \text{data points}$$

(2)

Gradient (a):

$$= \frac{1}{n}\sum_{i=1}^{n} 2\left(\underbrace{a + exp(x_1^{(i)} + b)}_{\hat{y}_i} - y^{(i)}\right)$$

Gradient (b):

$$= \frac{1}{n}\sum_{i=1}^{n} 2\left(\underbrace{a + exp(x_1^{(i)} + b)}_{\hat{y}_i} - y^{(i)}\right) exp(x_1^{(i)} + b)$$

(3)

initialize $\theta = [a, b] = [0, 0]$

α = Step-Size = (1)

DO {

$$\theta \leftarrow \theta - \alpha \nabla_\theta J(\theta)$$

}

while $(\alpha \| \nabla_\theta J \| > \varepsilon)$

Question NO.2:

{c}

Support count = $\sigma(\{c\}) = 8$

Support = $\frac{8}{10} = 0.8$

{b,d}

Support count = $\sigma(\{b,d\}) = 2$

Support ~~count~~ = $\frac{2}{10} = 0.2$

{b,d,e}

Support count = $\sigma(\{b,d,e\}) = 2$

Support = $\frac{2}{10} = 0.2$

Question NO.3:

Leaf Nodes that will be visited are: L1, L3, L5, L9 and L11

Question NO.4: