Questions and Answers:

1. Formula of Sigmoid Function along with Range

→ Formula : $(x) = \frac{1}{1+e^{-x}}$

. Range : Range of sigmoid function is lies between 0 to 1

2. Formula of Linear Kernel Along with Range

→ Formula : $K(x_i, x_j) = x_i \cdot x_j$

Range : The Range of linear kernel can be in any real number depending on input vectors.

3. Formula used in Naive Bayes classifier

→ Formula : $P(y/x) = \frac{P(x|y) \cdot P(y)}{P(x)}$

4. Formula of Polynomial Kernel

→ Formula : $K(x,y) = (x \cdot y + c)^{\wedge} d$

∴ c is constant
d is degree

5. Formula of Tanh Kernel

→ Formula: $K(x, y) = \tanh(ax \cdot y + c)$

6. Formula of Gradient Descent

→ Formula: $\theta = \theta_j - \alpha \frac{\partial J(\theta)}{\partial \theta_j}$

7. all three formulas of Linear Regression metrics

→ 1. mean Absolute Error

$$MAE = \frac{1}{n} \sum_{i=1}^{n} |y_i - \hat{y}_i|$$

2. mean squared Error

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

3. Root mean squared Error

$$RMSE = \sqrt{\frac{1}{n} \sum_{i=1}^{n} (y_i - \hat{y}_i)^2}$$

8. Formula of cost Function

→ Formula = $J = \frac{1}{2m} \sum_{i=1}^{m} (h_\theta(x_i) - y_i)^2$

9. All formula used in descriptive statistics.

→ Formula:

mean:

$$\mu = \frac{1}{N} \sum_{i=1}^{N} x_i$$

Median: The middle value of a data

mode: frequent value of data

variance:

$$\sigma^2 = \frac{1}{N} \sum_{i=1}^{N} (x_i - \mu)^2$$

standard Deviation:

$$\sigma = \sqrt{\frac{1}{N} \sum_{i=1}^{N} (x_i - \mu)^2}$$

10. All formula used in inferential statistics

→ formula:

Z-score:

$$Z = \frac{x - \mu}{\sigma}$$

t score: similar to z-score but used when the sample size small

Confidence interval for mean

$$CI = \bar{x} \pm z\left(\frac{\sigma}{\sqrt{n}}\right)$$

Hypothesis testing

$$t = \frac{\bar{x} - \mu_0}{\frac{s}{\sqrt{n}}}$$

Sample variance $(s^2) = \frac{1}{n-1} \sum_{i=1}^{n} (x_i - \bar{x})^2$

simple mean

$$\bar{x} = \frac{1}{n} \sum_{i=1}^{n} x_i$$