

1. Summarize the Stochastic Gradient Descent algorithm with diagram. Briefly illustrate the following functions in the algorithm: a) weight initialization b) gradient computation c) selection of learning rate d) weight updation
2. Mention any two cost/loss functions used in Machine Learning. Write brief notes on their a) functionality, b) merits, c) demerits and d) usage
3. Name any two activation functions used in Deep neural networks. Give your evaluation of their a) functionality, b) merits, c) demerits and d) usage
4. Develop a logistic regression model for classifying whether a politician can win an election for a given dataset.

S.No	No of hours campaigned	Amount of money spent (INR)	Result
1	300	40000	Won
2	100	90000	Lost
3	500	5000	Lost
4	400	20000	Won
.	.	.	.
.	.	.	.
1000	150	10000	Lost

Briefly describe all the necessary steps in building a classification model starting from the preprocessing until the final model with learned weights (Note: exact computation of weights and gradient is not necessary)

5. Briefly explain the following about Ensemble Learning: a) definition, b) functionality, c) how it achieve high accuracy comparing to smaller machine learning models, and d) possible demerits
6. What is the main idea of the influence of the following parameters in a deep neural networks' performance: a) number of nodes in a layer (lower vs higher), b) number of layers in a network (lower vs higher)