



मौलाना आजाद राष्ट्रीय प्रौद्योगिकी संस्थान, भोपाल- 462003

(शिक्षा मंत्रालय, भारत सरकार के तहत राष्ट्रीय महत्व का एक संस्थान)

**MAULANA AZAD NATIONAL INSTITUTE OF TECHNOLOGY, BHOPAL-
462003**

(An Institute of National importance under Ministry of Education, Govt. of India)

Department of Computer Science and Engineering

Deep Learning (FAI 521/FIS 565/FCN 571/FAC 562)

Assignment -1(Submission Deadline: 13/01/2024)

Date: 07/01/2024

1. Plot the following activation functions and their derivatives in Python. Additionally, discuss their limitations concerning the issues of vanishing and exploding gradients.
 - Linear
 - Sigmoid
 - Tanh
 - Softmax
 - Relu
 - weakyRelu
 2. Write about the various regularization techniques used in deep learning models to avoid overfitting.
 3. Prove that ReLU is a non-linear activation function. Map the following curve using the ReLU activation function and provide the corresponding plot.
 - $Y = x^2 + x - 2$
 - $Y = x^3 + x^2 + x - 2$
 - $Y = x^5 + x^2$
 - $Y = x^3 - x - 2$
 - $Y = x^6 + x^4 + x - 2$
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