|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **National University of Computer and Emerging Sciences, Lahore Campus** | | | | |
| C:\Users\saif\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.Word\final design.jpg | **Course:** | **Artificial Intelligence** | **Course Code:** | **AI-2002** |
| **Program:** | **BS(Computer Science)** | **Semester:** | **Spring 2024** |
| **Duration:** | **-** | **Total Marks:** | **10** |
| **Submission:** | **5-May-24** | **Weight** | **3.33 %** |
| **Section:** | **D/E/F** | **Page(s):** | **1** |
| **Exam:** | **Assignment 3** | **Roll No.** |  |
| **Instruction/Notes:**   * Submit the assignment in a jupyter notebook. * Properly document the code so that it is readable and understandable. | | | | |

**Title: Implementation of Back Propagation Algorithm from Scratch**

**Objective: To understand and implement the back propagation algorithm for training neural networks from scratch.**

**Tasks:**

1. Understanding Back Propagation Algorithm

* Read and understand the theory behind back propagation algorithm.
* Learn about the mathematical concepts involved, such as gradient descent, error calculation, and activation functions.

1. Implementing a Multilayer Perceptron

* Write code to implement a MLP with single hidden layer with back propagation algorithm.
* Do not use any built-in library for implementing the MLP. Not even numpy.
* Use any simple dataset (e.g. MNIST, IRIS etc.) to test the network and observe the accuracy.

1. Analyzing Results

* Analyze the results of MLP.
* Provide the results in terms of accuracy and loss

**Deliverables:**

* Implementation code of single layer neural network with back propagation algorithm.
* Report documenting the results of neural networks.