Department of Information Technology – University of the Punjab

Programming for AI – MPhil/PhD (AI) F22

Lab-10

Max Time: 1.5 hours Date: 08-03-2023

Instructions:

- Please provide your own solutions and DO NOT COPY the code from your colleagues or the web.
- You can discuss your problems only with the teachers.
- Submit .ipynb files and follow the following naming convention.

  RollNumber_Name_Lab#X i.e. MSAIF23M001_JohnDoe_Lab#10

Task # 01 - Pytorch Tensors 10 x 5 = 50 Marks

Perform the following tasks using pytorch tensors.

- Create a random tensor of size 5x5 and find the sum of all its elements.
- Create two random tensors of size 3x3 and add them together.
- Create a tensor of size 4x4 and multiply it by a scalar value of 5.
- Create a tensor of size 2x3 and reshape it to a tensor of size 3x2.
- Create a tensor of size 3x3 and find the maximum value in each row.
- Create a tensor of size 2x3 and calculate its transpose.
- Create two tensors of size 3x3 and perform element-wise multiplication between them.
- Create a tensor of size 5x5 and find the indices of its top 3 maximum values.
- Create a tensor of size 4x4 and calculate its determinant.
- Create a tensor of size 2x2 and find its inverse.

Task # 02 - Data Loading 5 x 2 = 10 Marks

Use PyTorch to implement the following:

- Load the MNIST dataset from the PyTorch datasets module.
- Define a PyTorch data loader to load the training data in batches.