|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **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:** | **30 Minutes** | **Total Marks:** | **10** |
| **Paper Date:** | **08-May-24** | **Weight** | **3.33%** |
| **Section:** | **D/F/F** | **Page(s):** | **2** |
| **Exam:** | **Quiz 4B** | **Roll No.** |  |
| **Instruction/Notes:**   * Provide your solution on this sheet. You may use an extra page for rough work. | | | | |

# Problem#1 (CLO-4) 10 Points

A medical diagnostic system was deployed to detect 2 distinct type of brain tumors i.e. TypeA and TypeB. The system also recognizes if there is no tumor. 10 tests are performed and the model’s prediction are as follows.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Actual** | TypeA | Normal | Normal | TypeA | Normal | TypeA | Normal | TypeB | TypeB | TypeA |
| **Predicted** | TypeA | TypeA | TypeA | TypeA | TypeA | TypeA | TypeA | Normal | Normal | TypeA |

1. Create a confusion matrix for the above data. **3 marks**

|  |  |  |  |
| --- | --- | --- | --- |
|  | TypeA | TypeB | Normal |
| TypeA | 4 | 0 | 4 |
| TypeB | 0 | 0 | 0 |
| Normal | 0 | 2 | 0 |

1. Compute Accuracy, precision and recall for each class. **1+3 marks**

Accuracy = 4/10 = 40%

Predicion TypeA = 0.5, Predicion TypeB = 0/0 undefined, Predicion TypeC =0

Recall TypeA = 1, Recall TypeB = 0, Recall TypeC = 0

1. Comment on the model performance based on your scores in part (b). **3 marks**

The model has a worst accuracy as it only classifies 4 instances correctly. The reason behind this behavior is that the model is unable to classify TypeB and Normal classes correctly. It has bias towards TypeA.