Department of CSE, Stamford University Bangladesh

Summer 2023 Midterm Examination

MCSE 666: Pattern and Speech Recognition

Full Marks: 5@20=100 Time: 2 Hours

I (a) Draw the conceptual framework for Pattern Recognition. Compare individual steps (08) for Human-based and Machine-based cases.

(b) What do you mean by measurements and features? Explains Pros and Cons to perform classification from measurements only and through features.

2 (a) What are the fundament types of Pattern Recognition problems? Which are available (10)

in the articles you studied for assignment? Explain briefly the most available one with required conditions.

(b) Suppose a classifier performed on a 3 class (i.e., Cl, C2 and C3) problem. For 12 (10) different patterns (P1 to P12) the desired class and classified by the classifier are as follows:

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Pattern | PI | P2 | P3 | P4 | P5 | P6 | P7 | P8 | P9 | PlO | P11 | P12 |
| Desired Class | Cl | C2 | Cl | C2 | C3 | C2 | Cl | C3 | Cl | C2 | C3 | Cl |
| Classified Class | CI | C2 | C3 | C2 | C3 | Cl | CI | C3 | Cl | C2 | Cl | Cl |

Pattern PI P2 P3 P4 P5 P6 P7 P8 P9 PlO P11 P12

Desired Class Cl C2 Cl C2 C3 C2 Cl C3 Cl C2 C3 Cl

Classified Class CI C2 C3 C2 C3 Cl CI C3 Cl C2 Cl Cl

Evaluate performance of the classifier with the measuring methods/techniques discussed in lectures.

3 (a) What do you mean by learning, memorizing and generalization? How memorizing (12) and generalization relates to learning?

(b) Is it a good idea to develop a classifier through memorizing only? Justify your (08) answer.

4 (a) What are basic differences between Regression and Classification tasks? 'Offset (08) effects on Penalty are different in Regression and Classification' — Justify the statement with necessary figures.

(b) Why all the available data/patterns not used develop a Classification/Regression (12) model? How Test and Validation sets are used to ensure model's performance?

5 (a) Compare structures of your two selected interested articles listing Section and (10) Subsection headings. [Instruction will be provided]

(b) Identify (mark on the printed copy) and compare objective, motivation, problem (10) definition, dataset information and performance measures from the two articles.