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17CS741

Seventh Semester B.E. Degree Examination, July/August 2022
Natural Language Processing

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Define NLP. Explain the challenges of NLP. (07 Marks)
- b. List and explain the applications of NLP. (07 Marks)
- c. Explain n-gram Statistical Language Model. (06 Marks)

OR

- 2 a. Explain Lexical functional grammar and the three conditions imposed by LFG on f-structure. (08 Marks)
- b. Write the C-structure and f-structure for the following sentence "VTU at Belgaum". Consider the following CFG Rules.
 $S \rightarrow NP VP$
 $VP \rightarrow V\{NP\} \{NP\} PP' \{S'\}$
 $PP \rightarrow P NP$
 $NP \rightarrow Det N \{PP\}$
 $S' \rightarrow Comp S$ (08 Marks)
- c. State major issues in Information Retrieval. (04 Marks)

Module-2

- 3 a. Write minimum edit distance algorithm and compute minimum edit distance for tutor and tumour. (07 Marks)
- b. Explain Earley parsing algorithm. (07 Marks)
- c. Explain Rule based Tagger. (06 Marks)

OR

- 4 a. Explain top-down parser and bottom-up parser with a suitable example. (08 Marks)
- b. Interpret Regular expressions and Finite State Automata with an example for each. (08 Marks)
- c. Explain Cocke-Younger-Kasami (CYK) algorithm. (04 Marks)

Module-3

- 5 a. Discuss learning with dependency path with an example. (07 Marks)
- b. Discuss the search techniques employed in InFact system. (07 Marks)
- c. List the steps involved in Active learning in the process of Learning to annotate cases with knowledge rules. (06 Marks)

OR

- 6 a. Explain the Learning Framework architecture in Learning to annotate cases with knowledges rules with brief notes. (08 Marks)
- b. Explain shortest path hypothesis. Write the different shortest paths for the statement "Jelistic created an atmosphere of terror at the camp by killing abusing and threatening the detainees." (08 Marks)
- c. Discuss domain knowledge and domain concepts in mining diagnostic text reports. (04 Marks)

Module-4

- 7 a. Discuss the evolutionary model for knowledge discovery from texts with a neat diagram. (07 Marks)
b. List and explain any seven evolution criteria to assess the hypothesis. (07 Marks)
c. Discuss hypothesis discovery in automatic evaluation of patterns. (06 Marks)

OR

- 8 a. List the steps in the algorithm for general document separation and explain in brief. (08 Marks)
b. Explain cohesion Coh-Matrix and Predictions. (08 Marks)
c. Discuss Metacognitive statements in iSTART feedback system. (04 Marks)

Module-5

- 9 a. Discuss Boolean information retrieval model with an example. (07 Marks)
b. Define Wordnet. Explain the applications of Wordnet. (07 Marks)
c. Discuss the design features of Information Retrieval Systems. (06 Marks)

OR

- 10 a. Explain cluster and Fuzzy information retrieval models. (08 Marks)
b. A user submitted a query to an IR System. Out of the 1st 18 documents returned by the system those ranked 1, 4, 6, 9, 12, 15, 17 were relevant. Compute non-interpolated average precision for this retrieval. Assume there are seven relevant documents. (08 Marks)
c. List and explain different taggers present in ACOPOST. (04 Marks)

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