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P=1

Q No 1

Natural Language Processing, usually shortened as NLP, is a branch of artificial intelligence that deals with the interaction between computers and humans using the natural language.

The ultimate objective of NLP is to read, decipher, understand and make sense of the human language in a manner that is valuable.

Most NLP techniques rely on machine learning to derive meaning from human languages.

Application of NLP

Spell checking

A spell checker is a software tool that identifies and corrects any spelling mistakes in a text. Most text editors let users check if their text contains spelling mistakes.

One of the most vivid examples is the Grammarly app. It is an online grammar checker that scans your text for all types of mistakes, from typos to sentence structure problems and beyond.

* Machine Translation

Everyone knows what is a manual translation - we translate information from one language into another.

Good example is Google Translate.

Challenges of NLP.

Setting the Context

One of the most important and challenging task in NLP process is to train a machine to derive context from a discussion within a document.

Consider the two sentence.

"I enjoy working in a bank"

I enjoy working near a river bank"

These sentence is quite different.

* Extracting semantic meanings.

Linguistic analysis of vocabulary terms might not be enough for a machine to correctly apply learned knowledge.

QNO 2.

(a) /a(bc)

Given string: ab abc ac acb
 a0b a2b a42c A87d

Sol. ab. abc. ac. acb. a0b. a2b. a42c
 A87d.

(b) /[abc]

Given string: ab. abc. ac. acb. a0b
 a2b a42c A87d.

Sol. ab. abc. ac. acb. a0b. a2b
a42c. A87d.

c /abc+

Given string: ab abc abcc babc

Sol. ab. abc. abcc. babc .

d abc*

Given string: ab abc abcc babc

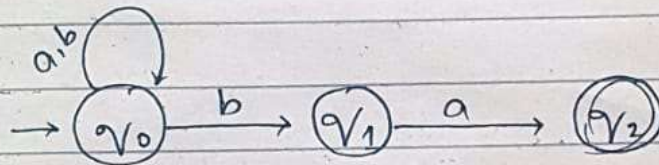
Sol. ab. abc. abcc. babc

(e) $\Sigma^+ a-zA-Z0-9$

Given string: a89 opx cfff \$1!

Sol. a89 . opx cfff \$1!

QNO-3. Design NFA



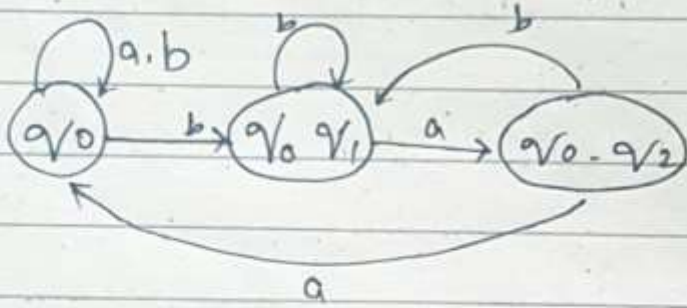
State	a	b
q_0	q_0	q_0, q_1
q_1	q_1	-
q_2	-	-

State	a	b
q_0	$\{q_0\}$	$\{q_0, q_1\}$
$\{q_0, q_1\}$	$\{q_0, q_1\}$	$\{q_0, q_1\}$
$\{q_0, q_1, q_2\}$	$\{q_0\}$	$\{q_0, q_1\}$

1

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Design DFA

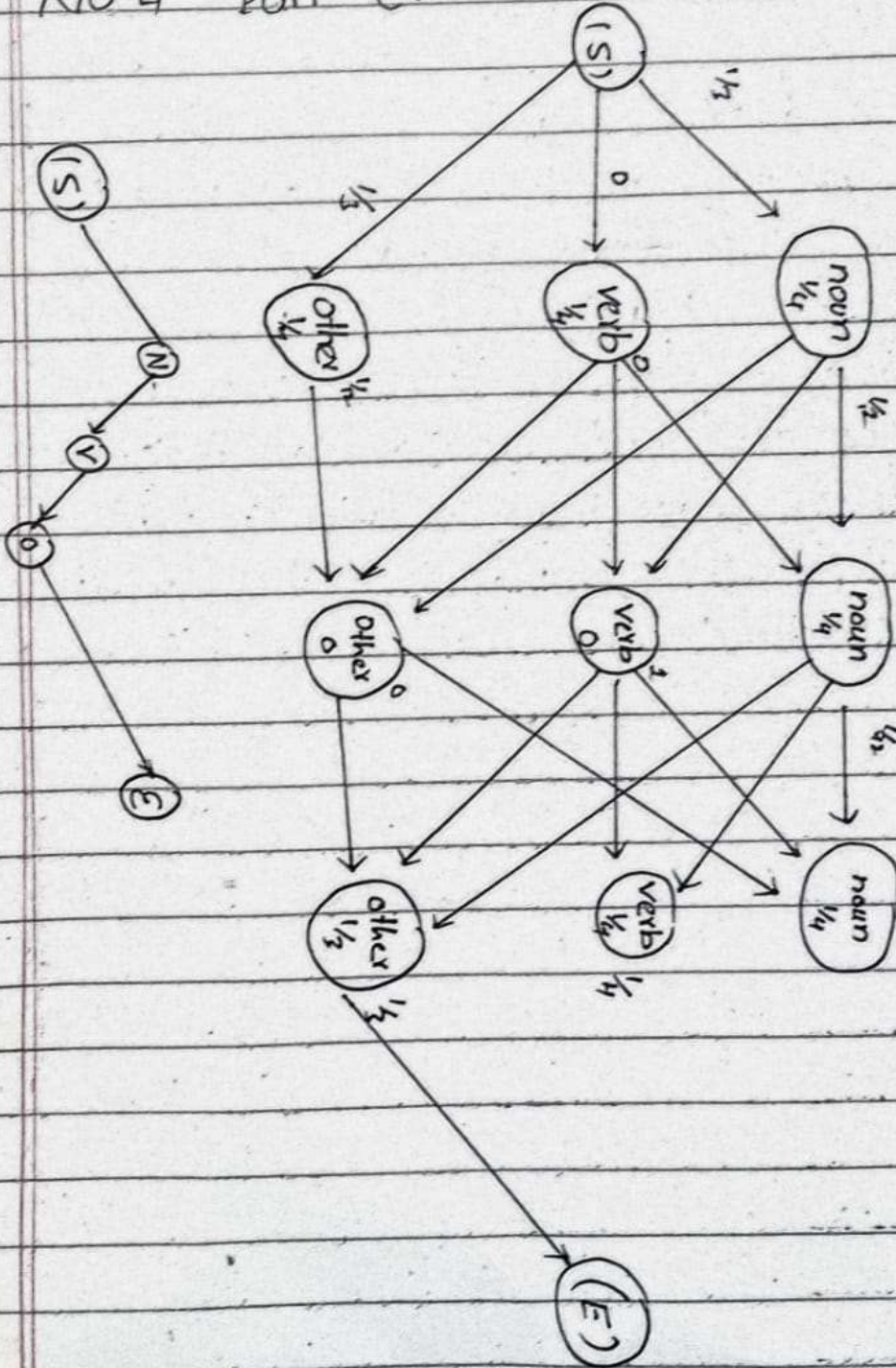


Q No. 4.

(a).

Pos taggin is the process of marking up word in corpus to a corresponding part of a speech tag. based on its context and definition this task is not straightforward, as a particular word may have a different part of speech based on the context in which the word is used.

Q No 4 Part C.



Q No 5. (b).

Compute the string w as 'abaabaa'
with left most derivation.

S	aAS		
\Rightarrow	abs	Rule	2
\Rightarrow	$abaAS$	Rule	3
\Rightarrow	$abaabSS$	Rule	1
\Rightarrow	$abaabAS$	Rule	2
\Rightarrow	$abaabaaS$	Rule	3
\Rightarrow	$abaabaa$	Rule	3

Left most derivation tree to obtain the string 'w' as follows.

