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Q NO 1.

Ans Natural Language processing (NLP) is a field of research to interpret natural language text or speech to develop useful application to public. Natural language processing researchers are aiming to collect knowledge on how human beings understand and use language, so that suitable tools and techniques can be developed to make computer systems understand and manipulate natural language to perform the desired activities.

Applications

- * Speech Recognition
- * Spell checking

* Speech Recognition

Speech Recognition has many applications, such as home automation, mobile, telephony, virtual assistance, hand-free computing, video games, and so on.

* Spell checking

Most text editors let users check if their text contains spelling mistakes. Neural networks are now incorporated into many spell-checking tools.

b) Define phonology and morphology

Phonology: Phonology is the study of how speech sound form patterns.

- * Phonology lets one know which sounds are from one's language and which are foreign.
- * Allows one to adjust pronunciation of morphemes
- * Helps one learn the different way plurals are pronounced.

Explanation of Phonological Rules

Deletion- Sound are left out of word

Insertion- Sound are put in word

Metathesis- Sound are reversed in order

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Morphology: Morphology is the study of word and how morphemes combine to create words

- * Morphemes are the smallest units of bases and affixes that combine to form word.
- * To know a language one must know the morphemes of that language.

Morphology Meets Communication Needs

- * Written and verbal communication will improve.
- * Helps students cross languages and transfer knowledge for communication.

Question NO 2.

(a) Regular expressions

A sequence of characters that define a search pattern.

Regular expressions are used in

- * Search engines
- * Search and replace dialogs of word processors and text editors
- * Many programming language provide regex capabilities builtin or via libraries.

(b) Specify the text.

(1) $\Gamma a-FA-FO-97$

Given string: a890pxcfff

Sol = a890pxcfff

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2 / [abc]

Given string: ac acb aob o2b a42c
A878

Sol: ac acb aob o2b a42c A878
abc

3 a(b|c)

Given string: abc aa acbaob

Sol abc aa acbaob

4 /abc*

Given string: ab abc abcc babc abc
abcc babc

(5) /abc+

Given string: ab abc abcc babc abc
abcc babc

Sol: ab abc abcc babc abc
abcc babc

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6 $[^a-zA-Z]$

Given string Price of cat \$1

Sol. Price of Cat \$1

(7) $[^a-zA-Z0-9]$

Given string: a89 opx cfff \$1!

Sol. a89 opx cfff \$1!

8 $^a(bc)$

Given string: ab abc ac acb a0b
a2b a42c A87d

Sol. ab abc ac acb a0b a2b
a42c A87d

9 $a[bc]$

Given string: abc ac acb a0ba2b

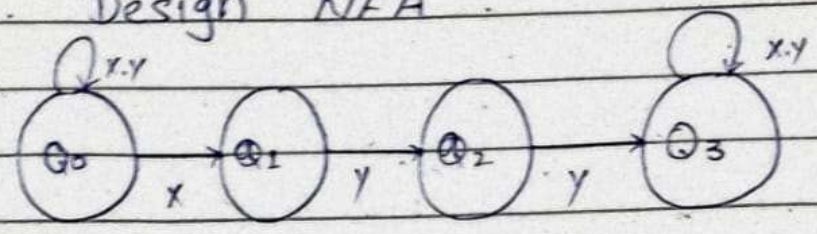
Sol. abc ac ~~acb~~ acb a0ba2b

10 $ab|bc$

Given string: ab abc ac acb a0b a2b
a42c A87d

Sol. ab abc ac acb a0b a2b
a42c A87d

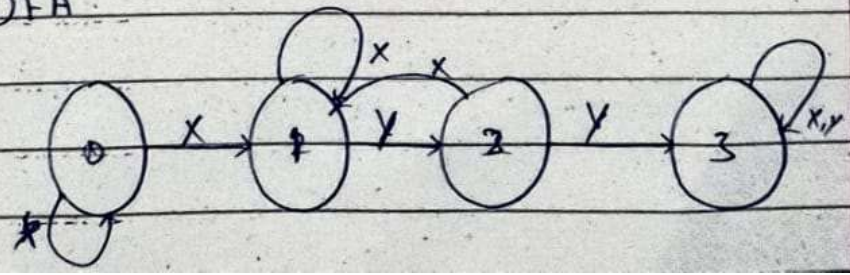
3. Design NFA



Q	x	y
Q0	Q0, Q1	Q0
Q1	Null	Q2
Q2	Null	Q3
Q3	Q4	Q3

Q	x	y
Q0	{Q0, Q1}	Q0
{Q0, Q1}	{Q0, Q1}	{Q0, Q2}
{Q0, Q2}	{Q0, Q1}	{Q0, Q3}
{Q0, Q3}	{Q0, Q1, Q2}	{Q0, Q3}
{Q0, Q1, Q2}	{Q0, Q1, Q2}	{Q0, Q3}

DFA

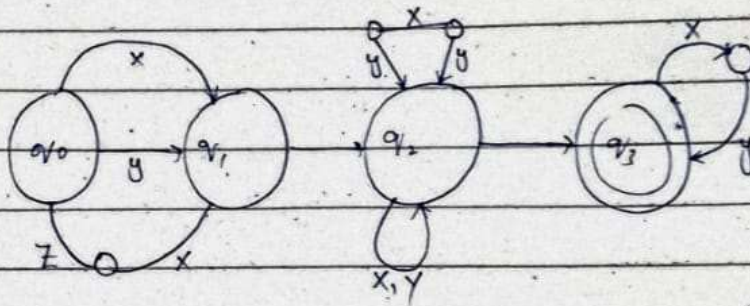


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QNO. 4 Design NFA

$$(x+y+zx)((yxy)^* + (x+y)^*)^*(xy)^*$$



QNO. 5.

Ans:

$$(i) P(\text{Jungle} | \text{the green}) = \frac{P(\text{The green jungle})}{P(\text{the green})} = \frac{2}{6}$$

$$(ii) P(\text{eyes} | \text{the green}) = \frac{P(\text{the green eyes})}{P(\text{the green})} = \frac{3}{6}$$

$$(iii) P(\text{Park} | \text{the green}) = \frac{P(\text{the green park})}{P(\text{the green})} = \frac{1}{6}$$

$$(iv) P(\text{sea} | \text{the green}) = \frac{P(\text{the green sea})}{P(\text{the green})} = \frac{0}{6}$$

$$P(s) = \frac{2}{6} \cdot \frac{3}{6} \cdot \frac{1}{6} \cdot \frac{0}{6} = 0$$

