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**Subject: (NLP) Semester: 5th**

**Department : Bs (SE) Instructor: Aasma Khan**

**Question No. 1:**  (08)

1. Briefly explain NLP? Write the name of 2 Applications of NLP with example? Write the name of 2 Challenges of NLP with example? (05)

Define Phonology and Morphology with the help of example? (03)

**Answer:** explain NLP :

NLP (Natural Language Processing) is the ability of computer program to understand human language as it is spoken .NLP is the component of artificial intelligent.

**Write the name of 2 Applications of NLP with example?**

**1. Email filters:**

Email filters are one of the most basic and initial applications of NLP online. It started

out with spam filters, uncovering certain words or phrases that signal a spam messages.

But filtering has upgraded, just like early adaptations of NLP.

## 2. Machine translation:

## Many languages don’t allow for straight translation and have different orders for

## sentence structure, which translation services used to overlook. With NLP, online

## translators can translate languages more accurately and present grammatically

## correct results. This is infinitely helpful when trying to communicate with someone

## in another language. Not only that, but when translating from another language to

## your own, tools now recognize the language based on inputted text and translate it.

## Write the name of 2 Challenges of NLP with example?

## 1. Quora Question Pairs

## 2. Two Sigma Connect

## Define Phonology and Morphology with the help of example?

## Phonology: Phonology is defined as the study of sound patterns and their meanings, both within and across languages

## Example: An example of phonology is the study of different sounds and the way they come together to form speech and words – such as the comparison of the sounds of the two “p” sounds in “pop-up”

**Morphology:**  Morphology is the branch of linguistics (and one of the major components of grammar) that studies word structures, especially regarding morphemes, which are the smallest units of language. They can be base words or components that form words, such as affixes. The adjective form is morphological.

**Example**: the word “cat” has just one morpheme but the word “cats” has 2, as the -s denotes plurality.

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**Question No. 2:**

1. What do you mean by regular expressions?
2. Specify the text strings using the below regular expressions:
3. /[a-fA-F0-9]
   1. Given string: a89opxcfff
4. /[abc]
   1. Given string abc ac acb a0b a2b a42c A878
5. a(b|c)
   1. Given string abc aa acbaob
6. /abc\*
   1. Given string ab abc abcc babc abc abcc babc
7. /abc+
   1. Given string ab abc abcc babc abc abcc babc
8. /[^a-z A-Z]
   1. Given string Price of cat $1
9. /[^a-z A-Z 0-9]
   1. Given string: a89 opx cfff $1!
10. /a(bc)
    1. Given string: ab abc ac acb a0b a2b a42c A87d
11. /a[bc]
    1. Given string abc ac acb a0ba2b
12. a|b|c
    1. Given string: ab abc ac acb a0b a2b a42c A87d

**Answer a: What do you mean by regular expressions?**

A regular expression (or “regex”) is a search pattern used for matching one or more characters within a string. It can match specific characters, wildcards, and ranges of characters. Regular expressions were originally used applications and word processors on multiple platforms. Regular expressions can also use most major programming language.

**Note:**I executed all regular expression in regex online website I have cropped all pictures and pasted here

1. **Specify the text strings using the below regular expressions:**
2. /[a-fA-F0-9]
   1. Given string: a89opxcfff

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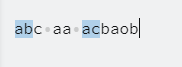
**Solution:**

1. /[abc]
   1. Given string abc ac acb a0b a2b a42c A878

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**Solution:**

1. a(b|c)
   1. Given string abc aa acbaob

****

**Solution:**

1. /abc\*
   1. Given string ab abc abcc babc abc abcc babc

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**Solution:**

1. /abc+

Given string ab abc abcc babc abc abcc babc

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**Solution:**

1. /[^a-z A-Z]
   1. Given string Price of cat $1

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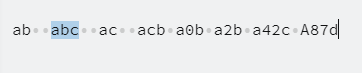
**Solution:**

1. /[^a-z A-Z 0-9]
   1. Given string: a89 opx cfff $1!

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**Solution:**

1. /a(bc)
   1. Given string: ab abc ac acb a0b a2b a42c A87d



**Solution:**

1. /a[bc]
   1. Given string abc ac acb a0ba2b

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**Solution:**

1. a|b|c
   1. Given string: ab abc ac acb a0b a2b a42c A87d

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**Solution:**

**Question No. 3:**

1. Design an NFA over an alphabet ∑={x,y} such that every string accepted must have a substring --xyy-- ? identify its tuples and also convert it into DFA.

**Answer:** NFA

--xyy—

X,y

X,y

x

x

y

|  |  |  |
| --- | --- | --- |
| Q | X | Y |
| Q0 | Q0 , Q1 | Q0 |
| Q1 | Null | Q2 |
| Q2 | Null | Q3 |
| Q3 | Q1 | Q3 |

|  |  |  |
| --- | --- | --- |
| Q | X | Y |
| → Q0 | {Q0 , Q1} | Q0 |
| {Q0,Q1} | {Q0,Q1} | {Q0,Q2} |
| {Q0,Q2} | null | {Q0,Q3} |
| {Q0,Q3} | {Q0,Q1,Q3} | {Q0,Q3} |
| {Q0,Q1,Q3} | {Q0,Q1,Q3} | {Q0,Q3} |

**DFA:**

Y

X

y

Y

Y

X

Y

y

y

y

Y