Text Processing For NLP Understanding Regex

In this presentation, we will explore the power of regular e
Natural Language Processing (NLP) and how they can be a
and preprocess data.

Getting Started with Regex

Learn the basics of Regular Expressions, including patterns, characters, metacharacters, escaping, and character classes.

Patterns and Characters

Discover how to use regex to find specific patterns of characters in textual data.

Metacharacters and Escaping

Master the art of escaping special characters in regex and when to use metacharacters.

Character Classes and Ranges

Unleash the power of character classes and ranges for matching different types of characters and numbers.

Patterns and Characters

- **Introduction to Patterns:** Regular expressions (regex) use patterns to m
  manipulate text. These patterns consist of characters and metacharact
  specific search criteria.
- **Literal Characters:** Literal characters in a regex pattern match the exac
  themselves. For example, the pattern "apple" matches the word "apple"
- **Character Sets:** Character sets allow matching any one of a set of char
  pattern "[aeiou]" matches any vowel in the text.
- **Escaping Special Characters:** Special characters like ".", "$", and "^" hav
  meanings in regex. To match them literally, they need to be escaped with
  like ".", "$", and "^".
- **Case Sensitivity:** By default, regex is case-sensitive. To perform case-in
  matching, flags can be used in the regex pattern.

Metacharacters and Escaping

- **Metacharacters:** Metacharacters in regex have special meanings and fu
  instance, "." matches any character, while "^" and "$" respectively denot
  end of a line.
- **Escaping Metacharacters:** To match metacharacters as literal characte
  be escaped with a backslash. For example, to match the dot character "
  pattern.
- **Literal Matching:** By escaping metacharacters, you can precisely match
  that would otherwise have special meanings.
- **Backslash Escaping:** Since the backslash itself is an escape character i
  programming languages, it must be escaped as well when using regex. U
  a literal backslash.
- **Metacharacter Combinations:** Combining metacharacters with literal c
  powerful patterns for complex text manipulation.

Character Classes and Ranges

- **Character Classes:** Character classes, enclosed in square brackets "[ ]
  matching any one character from a set. For example, "[aeiou]" matches
- **Negation:** Using the caret symbol "^" within a character class negates th
  vowel.
  "[^0-9]" matches any non-digit character.
- **Character Ranges:** Ranges within character classes specify a range of
  match. "[a-z]" matches any lowercase letter.
- **Combining Character Classes:** Character classes can be combined to
  complex patterns. "[A-Za-z]" matches any letter, regardless of case.
- **Shorthand Character Classes:** Shortcuts like "\d" for digits, "\w" for wor
  and "\s" for whitespace simplify pattern creation.

Quantifiers and Repetition

- **Quantifiers:** Quantifiers determine the number of times a preceding cha
  should appear in the text. For instance, "a{3}" matches "aaa".
- **Asterisk (*):** The asterisk quantifier matches zero or more occurrences
  preceding character or group. "ba*" matches "b", "ba", "baa", and so on.
- **Plus (+):** The plus quantifier matches one or more occurrences of the p
  character or group. "ca+" matches "ca", "caa", "caaa", and so on.
- **Question Mark (?):** The question mark quantifier matches zero or one o
  the preceding character or group. "da?" matches "d" and "da".
- **Braces ({ }):** Braces with a specific quantity, like "e{2}", match exactly th
  occurrences. "bee" matches "bee", but not "be".

Advanced Regex Techniques

Explore advanced regular expression techniques, including anchors, boundaries, alternation, backreference, subpatterns, lookahead, and lookbehind.

Anchors and Boundaries

Learn how to use anchors and boundaries to match specific positions within a string of text.

Groups and Capturing

Discover how to use groups and capturing to extract useful information.

Alternation and Logical OR

Understand how to use alternation and logical OR to match multiple patterns within a string.

Backreference and Subpatterns

Master the art of backreferences and subpatterns to match complex patterns with nested structures.

Groups and Capturing

- **Grouping with Parentheses:** Parentheses create groups to apply quanti
  alternation to specific sections.
- **Capturing Groups:** Parentheses also capture the matched content, whi
  accessed for extraction.
- **Named Capturing Groups:** Named groups provide a more descriptive re
  captured content.
- **Reusing Captured Content:** Captured content can be used later in the r
  with backreferences.

Alternation and Logical OR

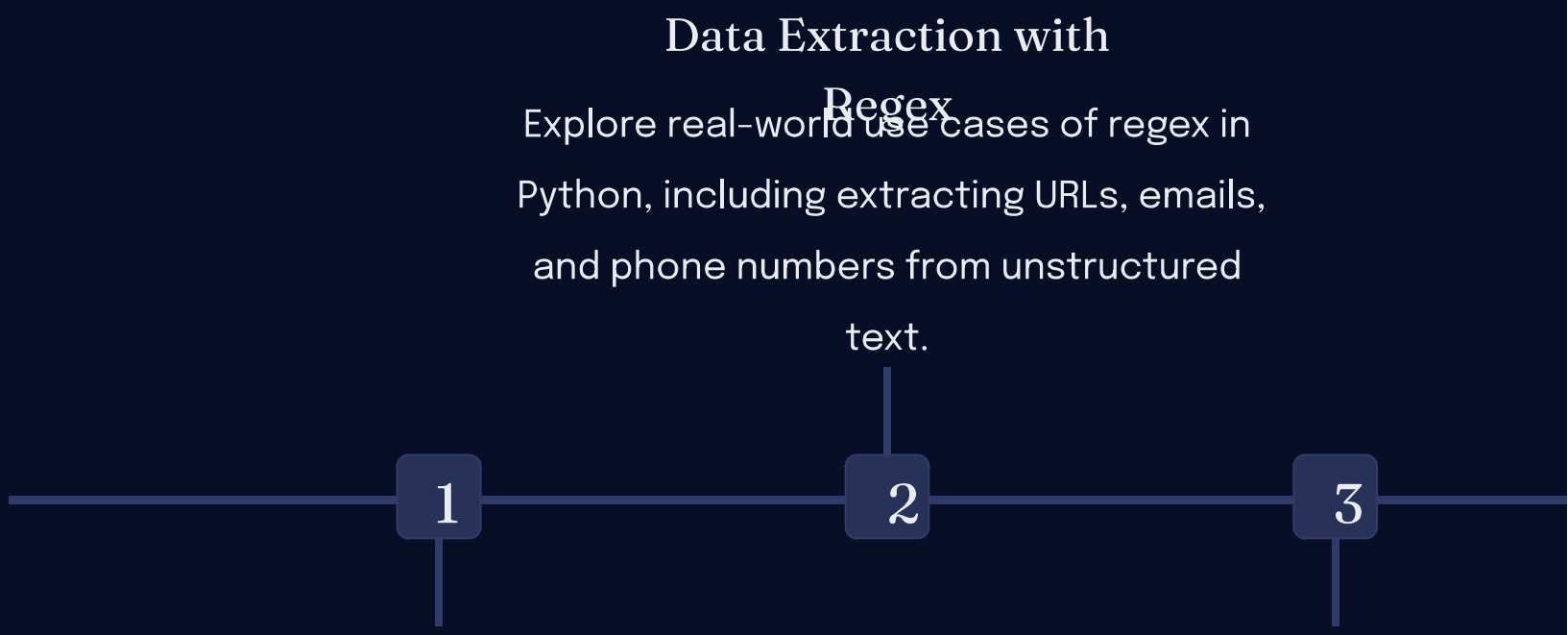
- **Alternation with |:** The pipe symbol "|" allows multiple alternatives to be pattern.
- **Matching Multiple Alternatives:** For instance, "apple|banana" matches "banana".
- **Non-Capturing Groups (?:):** Parentheses with "?" after the opening par non-capturing groups.
- **Balancing Options:** Alternation provides flexibility in matching different within a pattern.

Backreference and Subpatterns

- **Using Backreferences:** "\n" (where n is a number) matches content pre
  by a group.
- **Repeating Captured Content:** Backreferences allow patterns like "(app
  match "applepieapple".
- **Nested Subpatterns:** Parentheses can be nested to create subpattern
  complex matches.
- **Subpattern Scope:** Subpatterns are useful for applying quantifiers and
  specific portions of the pattern.

Best Practices for Using Regex in Python

Learn how to use the re module in Python 3 to apply regex on text data and how to pa
extract information from real-world use cases.



Introduction to re Module

1. **Importing the Module:** Begin by importing the `re` module in Python using
    - **Using re.search():** Use `re.search()` to find the first match of a pattern i
    - **Using re.findall():** Employ `re.findall()` to extract all occurrences of a p
    - **Flags for Flexibility:** Utilize flags like `re.IGNORECASE` for case-insensitive

string

Data Extraction with Regex

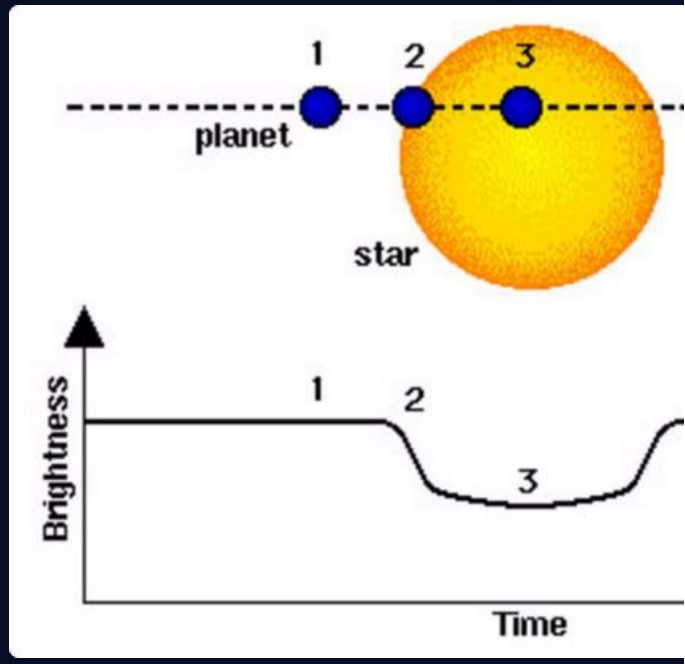
- **Extracting URLs:** Use regex to identify and extract URLs from text, aiding and analysis.
- **Capturing Emails:** Employ regex to capture and extract email addresses documents.
- **Phone Number Extraction:** Regex assists in parsing and retrieving phon various formats.
- **Pattern Customization:** Adapt patterns to different data formats for ac extraction.

Cleaning and Preprocessing with Regex

- **Removing Unwanted Characters:** Use regex to eliminate special charac punctuation, or symbols.
- **Whitespace Management:** Replace multiple spaces with a single space consistent formatting.
- **Text Normalization:** Apply regex for converting text to lowercase, stand representations.
- **Handling Redundancy:** Identify repeated characters or words with rege with a single instance.

Limitations and Best Practices of

Understand the limitations of Regex and how to apply best practices to maximi performance.



Regex Limitations

Explore the limits of regex when applied to Natural Language Processing and how to

Regex Best Practices

Discover the best practices f to maximize performance and

Conclusion

Regular Expressions are essential for text processing and Natural Language Pr
the knowledge, skills, and best practices covered in this presentation, you will
regex effectively and efficiently to your data processing needs.

Regex Basics

Patterns, Characters, Metacharacters, Escaping, Character Classes, Ranges, Quantifiers, Repetition.

Advanced Regex Techniques

Anchors, Boundaries, Groups, Capturing, Alternation, Logical OR, Backreference, Subpatterns, Lookahead, Lookbehind.

Regex I Python

re module,
Cleaning a
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