**1. Basics of Regex**

1. **Learn the Basic Syntax:**
   * **Literals:** Match exact characters, e.g., cat matches "cat".
   * **Meta-characters:** Special characters with meanings, e.g., . ^ $ \* + ? { } [ ] \ | ( ).
2. **Common Patterns:**
   * **Dot (.)** - Matches any single character.
   * **Caret (^)** - Matches the start of a string.
   * **Dollar ($)** - Matches the end of a string.
   * **Asterisk (\*)** - Matches 0 or more repetitions.
   * **Plus (+)** - Matches 1 or more repetitions.
   * **Question Mark (?)** - Matches 0 or 1 occurrence.
   * **Square Brackets ([ ])** - Matches any single character in brackets.
   * **Pipe (|)** - Acts as OR.
3. **Character Classes:**
   * **\d** - Matches digits (0–9).
   * **\w** - Matches word characters (letters, digits, underscores).
   * **\s** - Matches whitespace.
   * **\D, \W, \S** - Negated versions.
4. **Quantifiers:**
   * {n} - Matches exactly **n** repetitions.
   * {n,} - Matches **n** or more repetitions.
   * {n, m} - Matches between **n** and **m** repetitions.

**2. Hands-on Practice**

* Use **Regex Testing Tools**:
  + [Regex101](https://regex101.com/) - Interactive regex testing tool with explanations.
  + [Regexr](https://regexr.com/) - Provides tutorials and practice examples.
* Practice Regex Patterns:
  + Emails: \b[A-Za-z0-9.\_%+-]+@[A-Za-z0-9.-]+\.[A-Z|a-z]{2,}\b
  + Phone Numbers: \(?\d{3}\)?[-.\s]?\d{3}[-.\s]?\d{4}
  + Dates: \d{2}[./-]\d{2}[./-]\d{4}

**3. Learn Regex with Python**

Since you'll be applying Regex in NLP, start learning how to use it with Python's **re module**:

python

Copy code

import re

# Match a pattern

pattern = r'\b[A-Za-z]+\b'

text = "I love NLP and Regex!"

matches = re.findall(pattern, text)

print(matches) # Output: ['I', 'love', 'NLP', 'and', 'Regex']

* **re.findall()** – Returns all matches.
* **re.search()** – Searches for the first match.
* **re.match()** – Matches only at the start of a string.
* **re.sub()** – Replaces matched patterns.

**4. Advanced Regex Topics**

* Lookahead and Lookbehind Assertions:
  + **Positive Lookahead ((?=...))**
  + **Negative Lookahead ((?!...))**
  + **Positive Lookbehind ((?<=...))**
  + **Negative Lookbehind ((?<!...))**

Example:

python

Copy code

# Positive Lookahead

pattern = r'\b\w+(?=ing)\b'

text = "I am learning NLP and practicing Regex."

matches = re.findall(pattern, text)

print(matches) # Output: ['learn', 'practic']

**5. NLP After Regex**

Once you're comfortable with Regex, proceed to NLP basics:

1. **Text Preprocessing:**
   * Tokenization, Lemmatization, Stopword Removal.
2. **Libraries for NLP:**
   * **NLTK** and **spaCy**.
3. **Basic NLP Models:**
   * Sentiment Analysis, Named Entity Recognition (NER).
4. **Advanced NLP:**
   * Word Embeddings (Word2Vec, GloVe).
   * Transformer Models (BERT, GPT).