What is Regex?

Regular Expressions are sequences of characters that form **search patterns**, often used for:

- Validating input (emails, phone numbers)
- Searching or replacing text
- Extracting data from strings

Python provides the **`re` module** to work with regex.

Importing Regex Module

```
import re
```

Common Functions in `re` Module

Function	Description
`re.search()`	Search for a match anywhere in string
`re.match()`	Match only at the beginning
`re.findall()`	Find all matches and return a list
`re.sub()`	Replace text using a pattern
`re.split()`	Split string by the pattern

1. `re.search()` – Search for a pattern

```
import re

text = "I love Python"
match = re.search("Python", text)

if match:
    print("Found:", match.group())
```

2. `re.match()` – Match at the start of the string

```
import re

result = re.match("I", "I love Python")
print(result.group())  # Output: I
```

3. `re.findall()` – Return all matching patterns

```
text = "My number is 123, and his is 456."
numbers = re.findall(r"\d+", text)
print(numbers)  # ['123', '456']
```

4. `re.sub()` – Replace using regex

```
text = "Hello 123 world 456"
clean = re.sub(r"\d+", "#", text)
print(clean)  # Hello # world #
```

5. `re.split()` – Split text

```
text = "apple,banana;orange"
parts = re.split(r"[;,]", text)
print(parts)  # ['apple', 'banana', 'orange']
```

Common Regex Patterns

Pattern	Matches
`\d`	Digit (0–9)
`\D`	Non-digit
`\w`	Word character (a-z, A-Z, 0–9, _)
`\W`	Non-word character
`\s`	Whitespace
`.`	Any character except newline
`^`	Start of string
`$`	End of string
`[...]`	Set of characters
`` `a ``	b`
`*`	0 or more
`+`	1 or more
`?`	0 or 1