## 🧠 Topic 10: RegEX in Python

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### 🔹 Definition

**RegEX (Regular Expressions)** is a powerful tool for pattern matching and text processing in Python.
Python uses the re module for regular expressions.

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### 🔹 Terminologies

- **Pattern:** The sequence to search for.
- **Match:** The result when pattern is found.
- **Search:** Find pattern anywhere in string.
- **Group:** Part of pattern captured.
- **Special characters:** \d, \w, . etc.

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### 🔹 Example + Output

```
import re


text = "My phone is 123-456-7890"

pattern = r"\d{3}-\d{3}-\d{4}"


match = re.search(pattern, text)

if match:

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

**Output:**

```
Found: 123-456-7890
```

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- **Challenges**

**Solved Challenge 1:** Find all numbers in text

```
import re

text = "I have 3 apples and 5 oranges"

print(re.findall(r"\d+", text))
```

**Output:**

```
['3', '5']
```

**Solved Challenge 2:** Check if string starts with "Hello"

```
import re

text = "Hello World"

print(bool(re.match(r"Hello", text)))
```

**Output:**

```
True
```

**Your 18 Challenges:**

1. Match email pattern.
2. Extract all words from string.
3. Validate phone number.
4. Find all uppercase letters.
5. Check if string ends with .com.
6. Replace all digits with #.
7. Split string by spaces using regex.
8. Match dates in format DD/MM/YYYY.
9. Find all words starting with P.
10. Extract URLs from text.
11. Validate password (at least 1 number, 1 capital).
12. Find repeated words.

13. Remove extra spaces.
14. Replace vowels with *.
15. Count number of digits.
16. Match hex color code.
17. Extract domain from email.
18. Check if string is a valid IP address.