Practice questions

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1. Find all words that start with a capital letter

```
import re


text = "The Quick Brown Fox jumps over the Lazy Dog"
pattern = r'\b[A-Z][a-z]*\b'
matches = re.findall(pattern, text)
print(matches)  # Output: ['The', 'Quick', 'Brown', 'Fox', 'Lazy', 'Dog']
```

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2. Extract all numbers from a string

```
text = "My phone number is 12345 and my friend's is 67890."
pattern = r'\d+'
matches = re.findall(pattern, text)
print(matches)  # Output: ['12345', '67890']
```

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3. Validate an email address

```
def validate_email(email):
    pattern = r'^[a-zA-Z0-9_.+-]+@[a-zA-Z0-9-]+\.[a-zA-Z0-9-.]+$'
    return bool(re.match(pattern, email))


email = "example@gmail.com"
print(validate_email(email))  # Output: True
```

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4. Find all occurrences of "Python" (case-insensitive)

```
text = "python is fun. I love Python!"
pattern = r'(?i)\bpython\b'
matches = re.findall(pattern, text)
print(matches)  # Output: ['python', 'Python']
```

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5. Replace all white spaces with underscores

```
text = "Hello World! How are you?"
result = re.sub(r'\s+', '_', text)
print(result)  # Output: "Hello_World!_How_are_you?"
```

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6. Validate an IP address

```
def validate_ip(ip):
    pattern = r'^(\d{1,3}\.){3}\d{1,3}$'
    return bool(re.match(pattern, ip))

ip = "192.168.0.1"
print(validate_ip(ip))  # Output: True
```

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7. Find all dates in dd/mm/yyyy format

```
text = "Today's date is 28/11/2024, and tomorrow is 29/11/2024."
pattern = r'\b\d{2}/\d{2}/\d{4}\b'
matches = re.findall(pattern, text)
print(matches)  # Output: ['28/11/2024', '29/11/2024']
```

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8. Extract the domain name from a URL

```
url = "https://www.example.com/path/to/page"
pattern = r'https?://(?:www\.)?([^/]+)'
matches = re.search(pattern, url)
print(matches.group(1))  # Output: "example.com"
```

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9. Extract all hashtags

```
text = "This is #Python! Let's learn #Regex and #Programming."
pattern = r'#\w+'
```

```
matches = re.findall(pattern, text)
print(matches)  # Output: ['#Python', '#Regex', '#Programming']
```

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10. Validate a password

```
def validate_password(password):
    pattern = r'^(?=.*[a-z])(?=.*[A-Z])(?=.*\d)(?=.*[@$!%*?&])[A-Za-z\d@$!%*?&]{8,}$'
    return bool(re.match(pattern, password))

password = "Strong@123"
print(validate_password(password))  # Output: True
```

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11. Extract error codes from logs

```
text = "ERROR 404: Not Found\nERROR 500: Server Error"
pattern = r'ERROR (\d{3})'
matches = re.findall(pattern, text)
print(matches)  # Output: ['404', '500']
```

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12. Extract words with at least two vowels

```
text = "Regular expressions are powerful tools in text processing."
pattern = r'\b\w*[aeiouAEIOU]{2,}\w*\b'
matches = re.findall(pattern, text)
print(matches)  # Output: ['Regular', 'expressions', 'powerful', 'tools', 'processing']
```

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13. Validate an Indian phone number

```
def validate_phone_number(phone):
    pattern = r'^[789]\d{9}$'
    return bool(re.match(pattern, phone))

phone = "9876543210"
```

```
print(validate_phone_number(phone))  # Output: True
```

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14. Extract quoted strings

```
text = 'He said, "Hello!" and then added, \'How are you?\'.'
pattern = r'["\'](.*?)["\']'
matches = re.findall(pattern, text)
print(matches)  # Output: ['Hello!', 'How are you?']
```

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15. Identify valid URLs

```
urls = ["https://example.com", "http://google.com", "invalid.url"]
pattern = r'https?://[^\s/$.?#].[^\s]*'
valid_urls = [url for url in urls if re.match(pattern, url)]
print(valid_urls)  # Output: ['https://example.com', 'http://google.com']
```

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16. Split a string into sentences

```
text = "Hello! How are you? I am good."
pattern = r'[.!?]'
sentences = re.split(pattern, text)
sentences = [s.strip() for s in sentences if s.strip()]
print(sentences)  # Output: ['Hello', 'How are you', 'I am good']
```
