Class Exercise:

RegEx v2

You are given a log file containing various log entries from a server. Your task is to create a Python class that utilizes regular expressions to perform the following operations:

1. Extract all the IP addresses from the log file.
2. Replace all occurrences of a given pattern with a specified replacement string.
3. Split the log file into a list of log entries.
4. Find and print all the log entries that match a specific pattern.

Your class should have the following methods:

1. **extract\_ip\_addresses(log):** This method takes a string log as input and uses regular expressions to find and extract all the IP addresses present in the log. It should return a list of extracted IP addresses.
2. **replace\_pattern(log, pattern, replacement):** This method takes a string log, a regular expression pattern, and a replacement string replacement. It uses the **re.sub** function to replace all occurrences of the pattern in the log with the specified replacement string. It should return the modified log.
3. **split\_log\_entries(log):** This method takes a string log as input and uses regular expressions to split the log into a list of log entries. Each log entry should be a separate string in the list. It should return the list of log entries.
4. **find\_pattern(log, pattern):** This method takes a string log and a regular expression pattern as input. It uses regular expressions to find all log entries that match the pattern in the log and prints them.

import re

class LogAnalyzer:

    def extract\_ip\_addresses(self, log):

# Your code here

    def replace\_pattern(self, log, pattern, replacement):

# Your code here

    def split\_log\_entries(self, log):

# Your code here

    def find\_pattern(self, log, pattern):

# Your code here

# Example usage:

log\_file = """

2023-06-15 14:23:45 - [INFO] - User with IP 192.168.0.1 logged in.

2023-06-15 14:25:32 - [ERROR] - Connection timed out for IP 10.0.0.2.

2023-06-15 14:27:18 - [WARNING] - Excessive failed login attempts from IP 192.168.0.5.

"""

analyzer = LogAnalyzer()

# Extract IP addresses

ip\_addresses = analyzer.extract\_ip\_addresses(log\_file)

print("Extracted IP addresses:", ip\_addresses)

# Replace pattern

modified\_log = analyzer.replace\_pattern(log\_file, r'\bIP\b', 'IPAddress')

print("Modified log:\n", modified\_log)

# Split log entries

log\_entries = analyzer.split\_log\_entries(log\_file)

print("Log Entries:", log\_entries)

# Find pattern

analyzer.find\_pattern(log\_file, r'\[ERROR\].\*')

Expected output:

Extracted IP addresses: ['192.168.0.1', '10.0.0.2', '192.168.0.5']

Modified log:

2023-06-15 14:23:45 - [INFO] - User with IPAddress 192.168.0.1 logged in.

2023-06-15 14:25:32 - [ERROR] - Connection timed out for IPAddress 10.0.0.2.

2023-06-15 14:27:18 - [WARNING] - Excessive failed login attempts from IPAddress 192.168.0.5.

Log Entries: ['2023-06-15 14:23:45 - [INFO] - User with IP 192.168.0.1 logged in.', '2023-06-15 14:25:32 - [ERROR] - Connection timed out for IP 10.0.0.2.', '2023-06-15 14:27:18 - [WARNING] - Excessive failed login attempts from IP 192.168.0.5.']

2023-06-15 14:25:32 - [ERROR] - Connection timed out for IP 10.0.0.2.