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Roll No-39
Assignment No-02

You are given a large log file containing various system events. Each line in the log file follows this format:

[YYYY-MM-DD HH:MM:SS] [LOG_LEVEL] [MODULE] Message

where:

- YYYY-MM-DD HH:MM:SS is a timestamp.
- LOG_LEVEL can be INFO, WARN, ERROR, or DEBUG.
- MODULE represents the system module name (alphanumeric, can contain underscores).
- Message is the actual log message (it may contain any characters).

Task:
Write a function extract_critical_errors(log_data: str) -> list[tuple] that takes a multiline string log_data (containing log entries) and returns a list of tuples containing:

1. The timestamp
2. The module name
3. The error message

BUT only if:

- The LOG_LEVEL is ERROR.
- The message contains at least one IP address in IPv4 format (xxx.xxx.xxx.xxx, where xxx is in the range 0-255).
- The message contains a hexadecimal error code, formatted as 0x followed by exactly 8 hexadecimal digits (0-9, A-F).

(Note: Please ensure the text is formatted in Times New Roman font and adjust spacing properly.)

```
importre

defextract_critical_errors(log_data:str)->list[tuple]:
    #Regexpatterntocapturethenecessaryloginformation
    pattern=r'\[(\d{4}-\d{2}-\d{2}\d{2}:\d{2}:\d{2})\]\[ERROR\]\
[(\w+)\](.*(?:\d{1,3}\.){3}\d{1,3}.*0x[0-9A-Fa-f]{8}.*)'

    #Usere.findall()tofindallmatchesthatconformtothepattern
    matches=re.findall(pattern,log_data)
```

```
    #Returnthematchesasalistoftuples
    returnmatches

defget_user_input():
    #Taking4inputsfromtheuser
    LOG_1 = input("Enter the first LOG entry: ")
    LOG_2=input("EnterthesecondLOGentry:") LOG_3 =
    input("Enter the third LOG entry: ")
    LOG_4=input("EnterthefourthLOGentry:")

    #Combinetheinputstosimulatethelogdata
    log_data=f"{LOG_1}\n{LOG_2}\n{LOG_3}\n{LOG_4}"

    #Displaytheinputsonseparatelines
    print("\nInputs:")
    print(LOG_1)
    print(LOG_2)
    print(LOG_3)
    print(LOG_4)

    #Calltheextract_critical_errorsfunctiontoprocessthelog
data
    result=extract_critical_errors(log_data)

    #Displaytheresult(output)
    print("\nOutput:")
    foriteminresult:
        print(item)

#Callthefunction
get_user_input()
```

```
EnterthefirstLOGentry:[2025-02-1014:23:01][INFO][Auth_Module]User
login successful.
EnterthesecondLOGentry:[2025-02-1015:45:32][ERROR][Net_Module]Connection
timeout from 192.168.1.10. Error Code: 0xAB12CD34
EnterthethirdLOGentry:[2025-02-1016:01:10][WARN][Disk_Module]Low disk
space warning.
Enter the fourth LOG entry: [2025-02-10 17:12:05]
[ERROR][Security_Module]Unauthorizedaccessdetectedfrom10.0.0.5.ErrorCo
de: 0xDEADBEEF

Inputs:
[2025-02-10 14:23:01] [INFO] [Auth_Module] User login
successful.[2025-02-
1015:45:32][ERROR][Net_Module]Connectiontimeoutfrom192.168.1.10.
Error Code: 0xAB12CD34
[2025-02-10 16:01:10] [WARN] [Disk_Module] Low disk space
warning.[2025-02-
1017:12:05][ERROR][Security_Module]Unauthorizedaccessdetected from
10.0.0.5. Error Code: 0xDEADBEEF
```

```
Output:
('2025-02-1015:45:32','Net_Module','Connectiontimeoutfrom192.168.1.10.
Error Code: 0xAB12CD34')
('2025-02-1017:12:05','Security_Module','Unauthorizedaccessdetected
from 10.0.0.5. Error Code: 0xDEADBEEF')
```