Nishit Prakash Tare SE3-43

```
import re

def extract_critical_errors(log_data: str) -> list[tuple]:

    pattern = (r"^\[(\d{4}-\d{2}-\d{2} \d{2}:\d{2}:\d{2})\] "  # 
Timestamp
               r"\[ERROR\] "                                    # 
Match "[ERROR]"
               r"\[([\w_]+)\] "                                 # 
Extract module name
               r"(.*?\b(?:[0-9]{1,3}\.){3}[0-9]{1,3}\b.*?"      # 
Message must contain an IP
               r"\b0x[0-9A-Fa-f]{8}\b.*?)$")                    # 
Message must contain a hex error code


    matches = re.finditer(pattern, log_data, re.MULTILINE)


    result = [(match.group(1), match.group(2), match.group(3)) for 
match in matches]

    return result

log_data = """[2025-02-10 14:23:01] [INFO] [Auth_Module] User login 
successful.
[2025-02-10 15:45:32] [ERROR] [Net_Module] Connection timeout from 
192.168.1.10. Error Code: 0xAB12CD34
[2025-02-10 16:01:10] [WARN] [Disk_Module] Low disk space warning.
[2025-02-10 17:12:05] [ERROR] [Security_Module] Unauthorized access 
detected from 10.0.0.5. Error Code: 0xDEADBEEF"""

result = extract_critical_errors(log_data)
print(result)
```

```
[('2025-02-10 15:45:32', 'Net_Module', 'Connection timeout from 
192.168.1.10. Error Code: 0xAB12CD34'), ('2025-02-10 17:12:05', 
'Security_Module', 'Unauthorized access detected from 10.0.0.5. Error 
Code: 0xDEADBEEF')]
```