eBridge_CPU_Log

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1 eBridge - Data Preprocessing

1.1 Master of Science in Electronics - Emphasis on Embedded Systems

1.2 Costa Rica TEC

eBridge Github Page.

Our goal is to identify patterns on CPU load behaviors.

1.3 Data Preprocessing

First step is to load the libraries:

```
[1]: import numpy as np
     import pandas as pd
     import seaborn as sns
     from matplotlib import pyplot as plt
```

1.3.1 Load the dataset

The code below is used to load the dataset.

```
[2]: CoreData = pd.read_csv("Logs/RPI4-1/coreslog_2021-05-16_09-05.
      ↪csv",dtype={"Time": "string", "1": np.float64,"2": np.float64,
                                                      "3": np.float64,"4":
      ↪ np.float64})
```

The following commands allows to have a preview of the dataset.

```
[3]: CoreData.head()
```

```
[3]:                   Time      1    2      3     4
     0  2021-05-16 09:05:42  100.0  0.0  100.0   0.0
     1  2021-05-16 09:05:47    2.0  0.4    7.6  19.0
     2  2021-05-16 09:05:52    0.8  0.6   66.5  20.5
     3  2021-05-16 09:05:57    1.0  1.8   86.4  22.0
     4  2021-05-16 09:06:02    1.2  6.0   86.1  16.9
```

Convert the time to timestamp

[4]:

```
CoreData['Time'] = pd.to_datetime(CoreData['Time'])
```

[5]:

```
CoreData.describe()
```

[5]:

```
                   1             2             3             4
count   27429.000000  27429.000000  27429.000000  27429.000000
mean       16.112563     21.412436     34.877079     36.778326
std        28.018721     30.115804     37.343692     37.617364
min         0.000000      0.000000      0.000000      0.000000
25%         0.200000      0.600000      5.000000      5.200000
50%         2.000000      7.800000     15.500000     16.900000
75%        16.100000     20.100000     87.500000     87.800000
max       100.000000     92.200000    100.000000     94.800000
```

[6]:

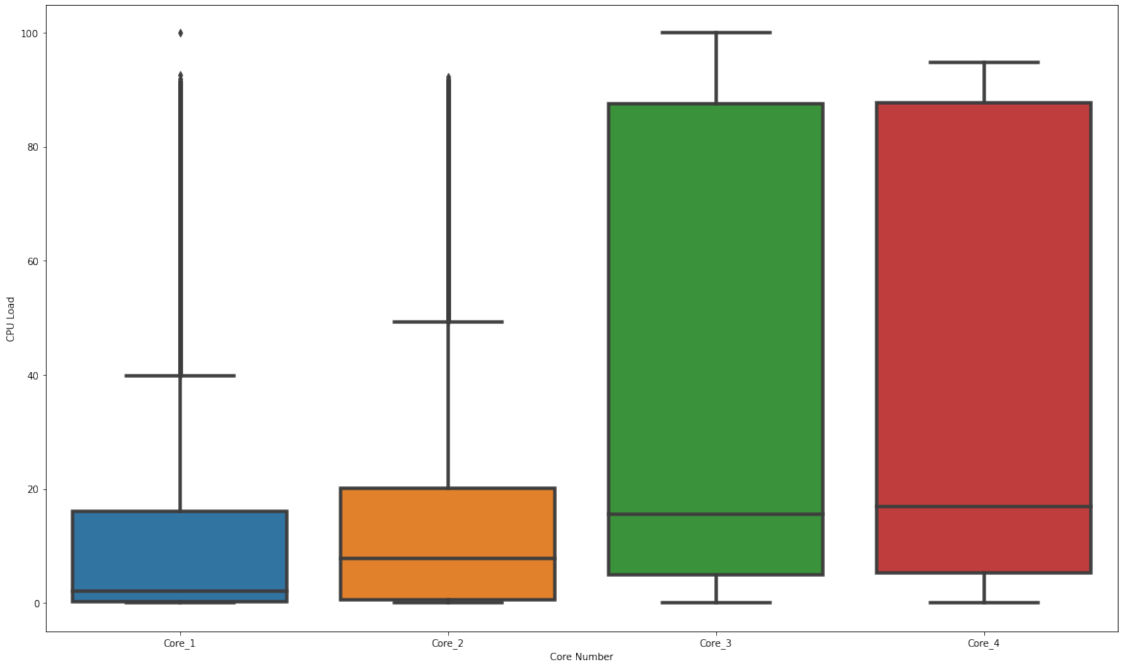
```
CoreData['Time']
```

[6]:

```
0        2021-05-16 09:05:42
1        2021-05-16 09:05:47
2        2021-05-16 09:05:52
3        2021-05-16 09:05:57
4        2021-05-16 09:06:02
                 …
27424    2021-05-17 23:13:43
27425    2021-05-17 23:13:48
27426    2021-05-17 23:13:53
27427    2021-05-17 23:13:58
27428    2021-05-17 23:14:03
Name: Time, Length: 27429, dtype: datetime64[ns]
```

[7]:

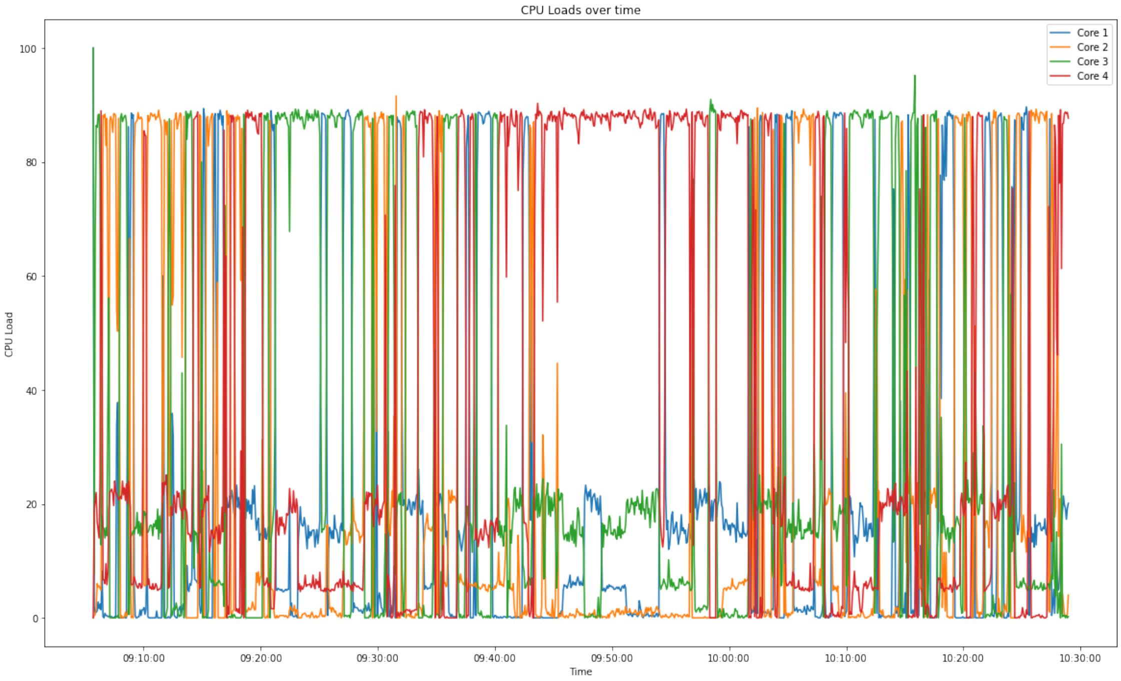
```
# Create Box Plots for Dataset

Core_Data = [CoreData['1'],CoreData['2'],
              CoreData['3'],CoreData['4']]
plt.figure(figsize=(20,12))
g = sns.boxplot(data=Core_Data, linewidth=3.5).set(xlabel='Core Number',␣
 ↪ylabel='CPU Load')
plt.xticks(ticks = [0,1,2,3], labels = ['Core_1','Core_2','Core_3','Core_4'])
plt.show()
```



[8]:

```python
# Scatter Plot

import matplotlib.pyplot as plt
import matplotlib.dates as md

CoreData = CoreData[:999]

plt.figure(figsize=(20,12))
plt.plot(CoreData['Time'], CoreData['1'], label = "Core 1")
plt.plot(CoreData['Time'], CoreData['2'], label = "Core 2")
plt.plot(CoreData['Time'], CoreData['3'], label = "Core 3")
plt.plot(CoreData['Time'], CoreData['4'], label = "Core 4")
plt.xlabel('Time')
ax=plt.gca()
xfmt = md.DateFormatter('%H:%M:%S')
ax.xaxis.set_major_formatter(xfmt)
# Set the y axis label of the current axis.
plt.ylabel('CPU Load')
# Set a title of the current axes.
plt.title('CPU Loads over time')
# show a legend on the plot
plt.legend()
# Display a figure.
plt.show()
```

```
#g=sns.lineplot(data=CoreData)
#(g.set_axis_labels("Time", "CPU Load"))

#plt.show()
```



[ ]:

```
```