

```
import pandas as pd
import seaborn as sns
import numpy as np
import datetime as dt
import matplotlib.pyplot as plt
import re
```

```
df = pd.read_csv('/content/drive/MyDrive/SensorAnalysis/HealthApp_2k.log_structured.csv')
templates = pd.read_csv('/content/drive/MyDrive/SensorAnalysis/HealthApp_2k.log_templates.csv')
```

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 2000 entries, 0 to 1999
Data columns (total 7 columns):
#   Column          Non-Null Count  Dtype
---  -
0   LineId           2000 non-null   int64
1   Time             2000 non-null   object
2   Component        2000 non-null   object
3   Pid              2000 non-null   int64
4   Content          2000 non-null   object
5   EventId          2000 non-null   object
6   EventTemplate    2000 non-null   object
dtypes: int64(2), object(5)
memory usage: 109.5+ KB
```

```
df = df.drop('Pid', axis = 1)
df.head()
```

	LineId	Time	Component	Content	EventId	
0	1	20171223-22:15:29:606	Step_LSC	onStandStepChanged 3579	E42	onStandSt
1	2	20171223-22:15:29:615	Step_LSC	onExtend:1514038530000 14 0 4	E39	onExtend:
2	3	20171223-22:15:29:633	Step_StandReportReceiver	onReceive action: android.intent.action.SCREEN_ON	E41	or android.intent.actio
3	4	20171223-22:15:29:635	Step_LSC	processHandleBroadcastAction action:android.in...	E43	processHandlef aci

```

df_e22 = df[df['EventId'] == 'E22']
df_e22['Time'] = pd.to_datetime(df_e22['Time'], format='%Y%m%d-%H:%M:%S:%f')
df_e22['Steps'] = df_e22['Content'].str.extract(r'##(\d+)##')
df_e22['Steps'] = df_e22['Steps'].astype(int)
plt.figure(figsize=(12, 6))
plt.plot(df_e22['Time'], df_e22['Steps'], marker='o', linestyle='-')
plt.title('Time vs. Steps for Event E22')
plt.xlabel('Time')
plt.ylabel('Steps')
plt.grid(True)
plt.xticks(rotation=45)
plt.tight_layout()
plt.show()

```

```
<ipython-input-5-6416114ee044>:2: SettingWithCopyWarning:  
A value is trying to be set on a copy of a slice from a DataFrame.  
Try using .loc[row_indexer,col_indexer] = value instead
```

See the caveats in the documentation: [https://pandas.pydata.org/pandas-docs/stable/user\\_guide/indexing](https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing).

```
df_e22['Time'] = pd.to_datetime(df_e22['Time'], format='%Y%m%d-%H:%M:%S%f')
```

```
<ipython-input-5-6416114ee044>:3: SettingWithCopyWarning:  
A value is trying to be set on a copy of a slice from a DataFrame.  
Try using .loc[row_indexer,col_indexer] = value instead
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```
df_e22['Steps'] = df_e22['Content'].str.extract(r'##(\d+)##')
```

```
<ipython-input-5-6416114ee044>:4: SettingWithCopyWarning:  
A value is trying to be set on a copy of a slice from a DataFrame.  
Try using .loc[row_indexer,col_indexer] = value instead
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```
df_e22['Steps'] = df_e22['Steps'].astype(int)
```



23 22:15

23 22:30

23 22:45

23 23:00

23 23:15

23 23:30

23 23:45



24 00:00

24 00:15

24 00:30

Time

df\_e22.head()

LineId	Time	Component	Content	EventId	EventTemplate	Steps		
5	6	2017-12-23 22:15:29.635	Step_SPUtills	getTodayTotalDetailSteps	E22	getTodayTotalDetailSteps	6993	
				=		= <*>##<*>##<*>##		
			1514038440000##699...			<*>#...		
15	16	2017-12-23 22:15:29.950	Step_SPUtills	getTodayTotalDetailSteps	E22	getTodayTotalDetailSteps	7007	
				=		= <*>##<*>##<*>##		
			1514038440000##700...			<*>#...		
22	23	2017-12-23	Step_SPUtills	getTodayTotalDetailSteps	E22	getTodayTotalDetailSteps	7008	
				=		= <*>##<*>##<*>##		

```
df_e22['Time'] = pd.to_datetime(df_e22['Time'], format='%Y%m%d-%H:%M:%S:%f')
```

```
df_e22['Date'] = df_e22['Time'].dt.date
```

```
print(df_e22[['Date', 'Steps']])
```

```
plt.figure(figsize=(10, 6))
plt.plot(df_e22['Date'], df_e22['Steps'], marker='o')
plt.title('Steps Per Day')
plt.xlabel('Date')
plt.ylabel('Steps')
```

```
plt.xticks(rotation=45)
plt.grid(True)
plt.tight_layout()
plt.show()
```

```
<ipython-input-19-2bfdacfad353>:1: SettingWithCopyWarning:  
A value is trying to be set on a copy of a slice from a DataFrame.  
Try using .loc[row_indexer,col_indexer] = value instead
```

See the caveats in the documentation: [https://pandas.pydata.org/pandas-docs/stable/user\\_guide/indexing](https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing).

```
df_e22['Time'] = pd.to_datetime(df_e22['Time'], format='%Y%m%d-%H:%M:%S%f')
```

```
<ipython-input-19-2bfdacfad353>:4: SettingWithCopyWarning:  
A value is trying to be set on a copy of a slice from a DataFrame.  
Try using .loc[row_indexer,col_indexer] = value instead
```

See the caveats in the documentation: [https://pandas.pydata.org/pandas-docs/stable/user\\_guide/indexing](https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing).

```
df_e22['Date'] = df_e22['Time'].dt.date
```

	Date	Steps
5	2017-12-23	6993
15	2017-12-23	7007
22	2017-12-23	7008
29	2017-12-23	7009
36	2017-12-23	7011
...	...	...
1925	2017-12-24	0
1935	2017-12-24	0
1951	2017-12-24	0
1957	2017-12-24	0
1966	2017-12-24	0

[242 rows x 2 columns]

Steps Per Day



df\_e22

	LineId	Time	Component	Content	EventId	EventTemplate	Steps	Date
5	6	2017-12-23 22:15:29.635	Step_SPUtils	getTodayTotalDetailSteps = 1514038440000##699...	E22	getTodayTotalDetailSteps = <*>##<*>##<*>## <*>#...	6993	2017-12-23
15	16	2017-12-23 22:15:29.950	Step_SPUtils	getTodayTotalDetailSteps = 1514038440000##700...	E22	getTodayTotalDetailSteps = <*>##<*>##<*>## <*>#...	7007	2017-12-23
22	23	2017-12-23 22:15:30.632	Step_SPUtils	getTodayTotalDetailSteps = 1514038440000##700...	E22	getTodayTotalDetailSteps = <*>##<*>##<*>## <*>#...	7008	2017-12-23
29	30	2017-12-23 22:15:31.142	Step_SPUtils	getTodayTotalDetailSteps = 1514038440000##700...	E22	getTodayTotalDetailSteps = <*>##<*>##<*>## <*>#...	7009	2017-12-23
36	37	2017-12-23 22:15:32.145	Step_SPUtils	getTodayTotalDetailSteps = 1514038440000##701...	E22	getTodayTotalDetailSteps = <*>##<*>##<*>## <*>#...	7011	2017-12-23
...	...	...	...	...	...	...	...	...
1925	1926	2017-12-24 00:11:57.442	Step_SPUtils	getTodayTotalDetailSteps = 1514045400000##0##...	E22	getTodayTotalDetailSteps = <*>##<*>##<*>## <*>#...	0	2017-12-24
1935	1936	2017-12-24	Step_SPUtils	getTodayTotalDetailSteps = ...	E22	getTodayTotalDetailSteps = <*>##<*>##<*>##	0	2017-12-24

```
df_e22['Date'] = df_e22['Time'].dt.date
df_e22['Hour'] = df_e22['Time'].dt.hour
df_e22['Minute'] = df_e22['Time'].dt.minute
```

```
steps_increase_threshold = 1000
min_duration_minutes = 30
```

```

workout_sessions = []
current_session = None

for index, row in df_e22.iterrows():
    if row['Steps'] > steps_increase_threshold:
        if current_session is None:
            current_session = {'start_time': row['Time']}
        else:
            current_session['end_time'] = row['Time']
    else:
        if current_session is not None:
            duration = (current_session['end_time'] - current_session['start_time']).total_seconds() / 60
            if duration >= min_duration_minutes:
                workout_sessions.append(current_session)
            current_session = None

if workout_sessions:
    print("Workout sessions:")
    for session in workout_sessions:
        print(f"Start: {session['start_time']} - End: {session['end_time']}")

```

Workout sessions:

Start: 2017-12-23 22:15:29.635000 - End: 2017-12-24 00:00:00.234000

<ipython-input-35-ed7fd5f30dda>:1: SettingWithCopyWarning:

A value is trying to be set on a copy of a slice from a DataFrame.

Try using .loc[row\_indexer,col\_indexer] = value instead

See the caveats in the documentation: [https://pandas.pydata.org/pandas-docs/stable/user\\_guide/indexing.html#returning-a-view-versus-a-copy](https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy)

```
df_e22['Date'] = df_e22['Time'].dt.date
```

<ipython-input-35-ed7fd5f30dda>:2: SettingWithCopyWarning:

A value is trying to be set on a copy of a slice from a DataFrame.

Try using .loc[row\_indexer,col\_indexer] = value instead

See the caveats in the documentation: [https://pandas.pydata.org/pandas-docs/stable/user\\_guide/indexing.html#returning-a-view-versus-a-copy](https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy)

```
df_e22['Hour'] = df_e22['Time'].dt.hour
```



```
<ipython-input-35-ed7fd5f30dda>:3: SettingWithCopyWarning:  
A value is trying to be set on a copy of a slice from a DataFrame.  
Try using .loc[row_indexer,col_indexer] = value instead
```

See the caveats in the documentation: [https://pandas.pydata.org/pandas-docs/stable/user\\_guide/indexing.html#returning-a-view-versus-a-copy](https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy)

```
df_e22['Minute'] = df_e22['Time'].dt.minute
```

```
df_e4 = df[df['EventId'] == 'E4']  
df_e4['Calories'] = df_e4['Content'].str.extract(r'(\d+)')  
df_e4['Calories'] = df_e4['Calories'].astype(int)  
df_e4.head()
```

<ipython-input-43-1313b38fa57d>:2: SettingWithCopyWarning:  
A value is trying to be set on a copy of a slice from a DataFrame.  
Try using .loc[row\_indexer,col\_indexer] = value instead

See the caveats in the documentation: [https://pandas.pydata.org/pandas-docs/stable/user\\_guide/indexing](https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing).

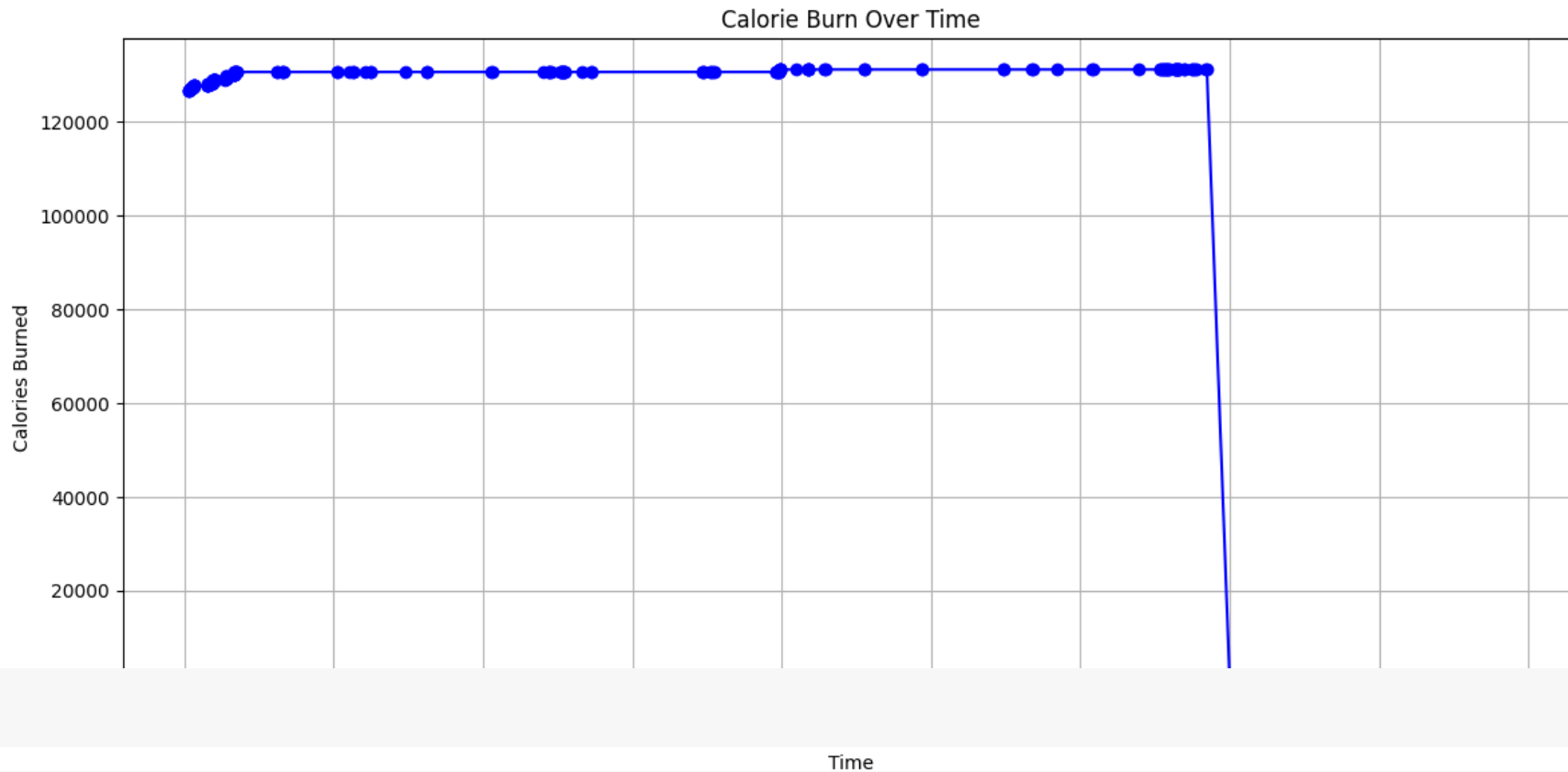
```
df_e4['Calories'] = df_e4['Content'].str.extract(r'(\d+)')
```

```
df_e4['Time'] = pd.to_datetime(df_e4['Time'])
```

```
plt.figure(figsize=(12, 6))  
plt.plot(df_e4['Time'], df_e4['Calories'], marker='o', linestyle='-', color='b')  
plt.title('Calorie Burn Over Time')  
plt.xlabel('Time')  
plt.ylabel('Calories Burned')  
plt.grid(True)  
plt.tight_layout()  
  
plt.gca().xaxis.set_major_formatter(plt.matplotlib.dates.DateFormatter('%H:%M:%S'))  
  
plt.show()
```

```
<ipython-input-44-4ebefb07f2b3>:1: SettingWithCopyWarning:  
A value is trying to be set on a copy of a slice from a DataFrame.  
Try using .loc[row_indexer,col_indexer] = value instead
```

See the caveats in the documentation: [https://pandas.pydata.org/pandas-docs/stable/user\\_guide/indexing](https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing).  
`df_e4['Time'] = pd.to_datetime(df_e4['Time'])`



#Conclusions

##Steps Counter

From the given observations app loads detailed steps data which occurs.

On further analysis (refer to cell 3) the following can be observed

\* on 23-12-2017(from 10:15PM to 23:57PM) person's total steps

## Conclusions

## Steps Counter

\* on 24-12-2017(from 00:00AM to 00:29AM) person's total steps = 0

\* Person's average number of steps per day = 23898 (approx)

\* Workout sessions (Refer to cell 4): Start: 2017-12-23 22:15:29.635000 - End: 2017-12-24 00:00:00.234000

\* On 23-12-2017 after 11:14PM there is no change in steps or movements so the person might be resting or put their phone on rest

## ##Calorie Counter

From the given observations app loads detailed calorie data when event E22 occurs.

On further analysis (refer to cell 7, 8) the following can be concluded:

\* on 23-12-2017(from 10:15PM to 23:57PM) person's total(cumulative) calories = 131208

\* on 24-12-2017(from 00:00AM to 00:29AM) person's total calories = 0

## ##Confirmations

\* On 23-12-2017 there is no any major change in steps and calories after 11:14 PM, this confirms that person is resting or put their phone on rest

From the given observations app loads detailed steps data when event E22 occurs. On further analysis (refer to cell 3) the following can be concluded:

- on 23-12-2017(from 10:15PM to 23:57PM) person's total step count = 7214
- on 24-12-2017(from 00:00AM to 00:29AM) person's total step count = 0
- Person's average number of steps per day = 23898 (approx)
- Workout sessions (Refer to cell 4): Start: 2017-12-23 22:15:29.635000 - End: 2017-12-24 00:00:00.234000
- On 23-12-2017 after 11:14PM there is no change in steps or there isn't any movements so the person might be resting or put their phone on rest

## Calorie Counter

From the given observations app loads detailed calorie data when event E4 occurs. On further analysis (refer to cell 7, 8) the following can be concluded:

- on 23-12-2017(from 10:15PM to 23:57PM) person's total(cumulative) calories = 131208
- on 24-12-2017(from 00:00AM to 00:29AM) person's total calories = 0

## Confirmations

- On 23-12-2017 there is no any major change in steps and calories from 11:14 PM, this confirms that person is resting or put thier phone on rest

✓ 0s completed at 4:34 PM

Could not connect to the reCAPTCHA service. Please check your internet connection and reload to get a reCAPTCHA challenge.

