Project-Feature-Extraction

May 14, 2020

[1]:
```
import os
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
%matplotlib inline
```

0.0.1 To Convert the .txt files to .csv files

[2]:
```
for i in range(1,420):

    for j in [1,2,3]:

        try:
            txt_file = str(i)+'_'+str(j)+'.txt'
            #change this file_txt directory to where the txt files are saved
            file_txt = open('F:/jupyter/project/sample/'+txt_file)

            #change the directory to specify where to save the file
            directory = 'F:/jupyter/project/sample/csv'
            file_name = str(i)+'_'+str(j)+'.csv'
            file_path = os.path.join(directory,file_name)

            #to create new directory uncomment the below lines
            #if not os.path.isdir(directory):
            #     os.path.mkdir(directory)


            file = open(file_path,'w')
            file.write('ppg_output\n')
            for lines in file_txt:
                line = lines.strip()
                l = line.split('\t')
                file.write('\n'.join(l))


            file.close()
```

```
            file_txt.close()


        except:
            pass
```

0.0.2 Creating a Pandas DataFrame for the Patient ID's

[3]:
```
serial = []
sample_name = []
number = 1
for i in range(1,420):

    for j in [1,2,3]:

        try:

            txt_file = str(i)+'_'+str(j)+'.txt'
            #change this file_txt directory to where the txt files are saved
            file_txt = open('F:/jupyter/project/sample/'+txt_file)

            serial.append(number)
            sample_name.append(txt_file[:-4])

            number += 1

        except: pass

serial = np.array(serial)
sample_name = np.array(sample_name)

df = pd.DataFrame(serial,columns=['serial.no'])
df['sampleID'] = sample_name
df
```

[3]:

	serial.no	sampleID
0	1	2_1
1	2	2_2
2	3	2_3
3	4	3_1
4	5	3_2
..	…	…
652	653	418_2
653	654	418_3
654	655	419_1
655	656	419_2
656	657	419_3

```
[657 rows x 2 columns]
```

0.1 Mean and Standard Deviation of the samples

[4]:
```
mean = []
standard_deviation = []

for sample_id in df['sampleID']:

    #directory of the .csv file
    directory = 'F:/jupyter/project/sample/csv/'
    f_name = sample_id + '.csv'

    file_path = os.path.join(directory,f_name)
    temp_frame = pd.read_csv(file_path)

    mean.append(temp_frame['ppg_output'].mean())
    standard_deviation.append(temp_frame['ppg_output'].std())

mean = np.array(mean)
standard_deviation = np.array(standard_deviation)

df['mean'] = mean
df['std_dev'] = standard_deviation

df
```

[4]:

	serial.no	sampleID	mean	std_dev
0	1	2_1	2036.919048	252.540938
1	2	2_2	2033.933333	146.344625
2	3	2_3	2045.224762	150.830125
3	4	3_1	2004.390476	54.943931
4	5	3_2	2001.574286	52.859155
..	…	…	…	…
652	653	418_2	2647.587143	259.336671
653	654	418_3	2611.728571	259.246571
654	655	419_1	2606.378095	247.667533
655	656	419_2	2591.536190	295.804593
656	657	419_3	2630.210952	295.984836

```
[657 rows x 4 columns]
```

0.2 Kurtosis of the signals

[5]:
```
from scipy.stats import kurtosis
kurt = []
for sample_id in df['sampleID']:

    #directory of the csv file folder
    directory = 'F:/jupyter/project/sample/csv/'
    f_name = sample_id + '.csv'

    file_path = os.path.join(directory,f_name)
    temp_frame = pd.read_csv(file_path)

    kurtosis_val = kurtosis(temp_frame['ppg_output'])
    kurt.append(kurtosis_val)

kurt = np.array(kurt)

df['kurtosis'] = kurt

df
```

[5]:

	serial.no	sampleID	mean	std_dev	kurtosis
0	1	2_1	2036.919048	252.540938	-0.852316
1	2	2_2	2033.933333	146.344625	-0.927452
2	3	2_3	2045.224762	150.830125	-0.776220
3	4	3_1	2004.390476	54.943931	-0.989512
4	5	3_2	2001.574286	52.859155	-0.990753
..	…	…	…	…	…
652	653	418_2	2647.587143	259.336671	-0.891094
653	654	418_3	2611.728571	259.246571	-0.222926
654	655	419_1	2606.378095	247.667533	-0.430874
655	656	419_2	2591.536190	295.804593	-0.421466
656	657	419_3	2630.210952	295.984836	-1.015883

[657 rows x 5 columns]

0.3 RMS value calculation

[6]:
```
rms = []
for sample_id in df['sampleID']:

    #path to the .csv file folder
    directory = 'F:/jupyter/project/sample/csv/'
    f_name = sample_id + '.csv'

    file_path = os.path.join(directory,f_name)
```

```
    temp_frame = pd.read_csv(file_path)

    #calculation for rms
    rms.append(np.sqrt(np.mean(temp_frame['ppg_output']**2)))

df['rms'] = np.array(rms)

df
```

[6]:

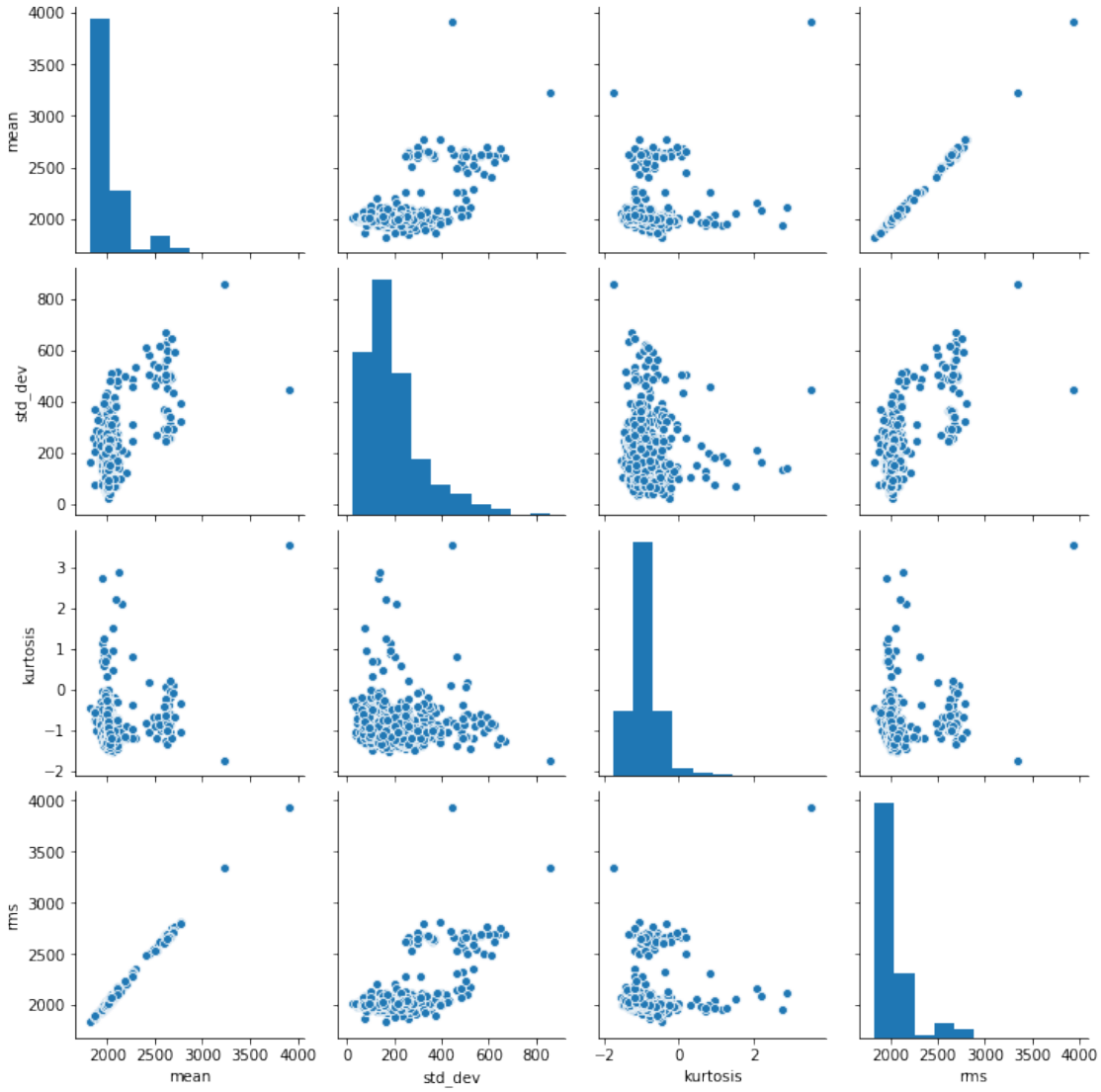
	serial.no	sampleID	mean	std_dev	kurtosis	rms
0	1	2_1	2036.919048	252.540938	-0.852316	2052.507189
1	2	2_2	2033.933333	146.344625	-0.927452	2039.188896
2	3	2_3	2045.224762	150.830125	-0.776220	2050.776248
3	4	3_1	2004.390476	54.943931	-0.989512	2005.143032
4	5	3_2	2001.574286	52.859155	-0.990753	2002.271805
..	…	…	…	…	…	…
652	653	418_2	2647.587143	259.336671	-0.891094	2660.252086
653	654	418_3	2611.728571	259.246571	-0.222926	2624.557660
654	655	419_1	2606.378095	247.667533	-0.430874	2618.113209
655	656	419_2	2591.536190	295.804593	-0.421466	2608.355520
656	657	419_3	2630.210952	295.984836	-1.015883	2646.804670

[657 rows x 6 columns]

0.4 Ploting the values

[7]:
```
sns.pairplot(df[['mean','std_dev','kurtosis','rms']],palette='red')
```

[7]:
```
<seaborn.axisgrid.PairGrid at 0x1f857bef288>
```


mean
std_dev
kurtosis
rms
4000
3500
3000
2500
2000
800
600
400
200
0
3
2
1
0
−1
−2
−2
0
2

[ ]: