CURSO - Desenvolvimento full Stack
DISCIPLINA – Tratando a imensidão dos dados
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Contextualização

Como Analista de Dados, você recebeu, em um novo projeto, um conjunto de dados. Sua principal tarefa é tratar os dados desse a fim de que possam ser utilizados para a descoberta de conhecimento através de sua posterior análise e interpretação. Para tal tarefa, você deverá utilizar a linguagem Python e a biblioteca Pandas.

Procedimentos

Após ler um conjunto de dados, fornecidos no enunciado da entrega, compostos pelas conlunas ID;Duration;Date;Pulse;Maxpulse;Calories devemos desenvolver a seguinte programação:

```python
#Importing pandas library
import pandas as pand

# Fonte de dados ==> formato CSV
csv_dados = 'picoweb_dados.csv'

# pegando os dados no arquivo CSV
df = pand.read_csv(csv_dados, sep=';', engine='python', encoding='utf-8')

# Imprimindo informações gerais do dataframe
print("Imprimindo informações gerais do DataFrame:")
print(df.info())
print("============================================================")
```

picoweb.ipynb | picoweb.ipynb (output)

```
Imprimindo informações gerais do DataFrame:
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 32 entries, 0 to 31
Data columns (total 6 columns):
 #   Column    Non-Null Count  Dtype
---  ------    --------------  -----
 0   ID        32 non-null     int64
 1   Duration  32 non-null     int64
 2   Date      31 non-null     object
 3   Pulse     32 non-null     int64
 4   Maxpulse  32 non-null     int64
 5   Calories  30 non-null     float64
```

```python
# Imprimindo as 5 primeiras linhas
print("\nPrint das 5 primeiras Linhas:")
print(df.head())
print("============================================================")

# Imprimindo as 5 últimas linhas
print("\nPrint das 5 últimas Linhas:")
print(df.tail())
print("============================================================")
```

```
Print das 5 primeiras Linhas:
   ID  Duration          Date  Pulse  Maxpulse  Calories
0   0        60  '2020/12/01'    110       130    4091.0
1   1        60  '2020/12/02'    117       145    4790.0
2   2        60  '2020/12/03'    103       135    3400.0
3   3        45  '2020/12/04'    109       175    2824.0
4   4        45  '2020/12/05'    117       148    4060.0
============================================================

Print das 5 Últimas Linhas:
    ID  Duration          Date  Pulse  Maxpulse  Calories
27  27        60  '2020/12/27'     92       118    2410.0
28  28        60  '2020/12/28'    103       132       NaN
29  29        60  '2020/12/29'    100       132    2800.0
30  30        60  '2020/12/30'    102       129    3803.0
31  31        60  '2020/12/31'     92       115    2430.0
============================================================
```

```python
# Criando uma cópia de segurança dos dados
df_copy = df.copy()
```

```python
# Substituindo os valores nulos na coluna "Calories" por 0
df_copy['Calories'].fillna(0, inplace=True)
print("\nPrint do DataFrame após substituição dos valores nulos na coluna 'Calories':")
print(df_copy)
print("=======================================================")
```

```
Print do DataFrame após substituição dos valores nulos na coluna 'Calories':
    ID  Duration          Date  Pulse  Maxpulse  Calories
0    0        60  '2020/12/01'    110       130    4091.0
1    1        60  '2020/12/02'    117       145    4790.0
2    2        60  '2020/12/03'    103       135    3400.0
3    3        45  '2020/12/04'    109       175    2824.0
4    4        45  '2020/12/05'    117       148    4060.0
5    5        60  '2020/12/06'    102       127    3000.0
6    6        60  '2020/12/07'    110       136    3740.0
7    7       450  '2020/12/08'    104       134    2533.0
8    8        30  '2020/12/09'    109       133    1951.0
9    9        60  '2020/12/10'     98       124    2690.0
10  10        60  '2020/12/11'    103       147    3293.0
11  11        60  '2020/12/12'    100       120    2507.0
12  12        60  '2020/12/12'    100       120    2507.0
13  13        60  '2020/12/13'    106       128    3453.0
14  14        60  '2020/12/14'    104       132    3793.0
15  15        60  '2020/12/15'     98       123    2750.0
16  16        60  '2020/12/16'     98       120    2152.0
17  17        60  '2020/12/17'    100       120    3000.0
18  18        45  '2020/12/18'     90       112       0.0
19  19        60  '2020/12/19'    103       123    3230.0
20  20        45  '2020/12/20'     97       125    2430.0
21  21        60  '2020/12/21'    108       131    3642.0
22  22        45           NaN    100       119    2820.0
23  23        60  '2020/12/23'    130       101    3000.0
24  24        45  '2020/12/24'    105       132    2460.0
25  25        60  '2020/12/25'    102       126    3345.0
26  26        60      20201226    100       120    2500.0
27  27        60  '2020/12/27'     92       118    2410.0
28  28        60  '2020/12/28'    103       132       0.0
29  29        60  '2020/12/29'    100       132    2800.0
30  30        60  '2020/12/30'    102       129    3803.0
31  31        60  '2020/12/31'     92       115    2430.0
=======================================================
```

```python
# Substituindo os valores nulos na coluna "Date" por "1900/01/01"
df_copy['Date'].fillna('1900/01/01', inplace=True)
print("\nPrint do DataFrame após substituição dos valores nulos na coluna 'Date':")
print(df_copy)
print("============================================================")
```

```
Print do DataFrame após substituição dos valores nulos na coluna 'Date':
    ID  Duration          Date  Pulse  Maxpulse  Calories
0    0        60  '2020/12/01'    110       130    4091.0
1    1        60  '2020/12/02'    117       145    4790.0
2    2        60  '2020/12/03'    103       135    3400.0
3    3        45  '2020/12/04'    109       175    2824.0
4    4        45  '2020/12/05'    117       148    4060.0
5    5        60  '2020/12/06'    102       127    3000.0
6    6        60  '2020/12/07'    110       136    3740.0
7    7       450  '2020/12/08'    104       134    2533.0
8    8        30  '2020/12/09'    109       133    1951.0
9    9        60  '2020/12/10'     98       124    2690.0
10  10        60  '2020/12/11'    103       147    3293.0
11  11        60  '2020/12/12'    100       120    2507.0
12  12        60  '2020/12/12'    100       120    2507.0
13  13        60  '2020/12/13'    106       128    3453.0
14  14        60  '2020/12/14'    104       132    3793.0
15  15        60  '2020/12/15'     98       123    2750.0
16  16        60  '2020/12/16'     98       120    2152.0
17  17        60  '2020/12/17'    100       120    3000.0
18  18        45  '2020/12/18'     90       112       0.0
19  19        60  '2020/12/19'    103       123    3230.0
20  20        45  '2020/12/20'     97       125    2430.0
21  21        60  '2020/12/21'    108       131    3642.0
22  22        45    1900/01/01    100       119    2820.0
23  23        60  '2020/12/23'    130       101    3000.0
24  24        45  '2020/12/24'    105       132    2460.0
25  25        60  '2020/12/25'    102       126    3345.0
26  26        60      20201226    100       120    2500.0
27  27        60  '2020/12/27'     92       118    2410.0
28  28        60  '2020/12/28'    103       132       0.0
29  29        60  '2020/12/29'    100       132    2800.0
30  30        60  '2020/12/30'    102       129    3803.0
31  31        60  '2020/12/31'     92       115    2430.0
============================================================
```

```python
# Corrigindo o formato das datas
df_copy['Date'] = df_copy['Date'].str.strip("'")
df_copy['Date'] = df_copy['Date'].astype(str).replace({'20201226': '2020/12/26'})
df_copy['Date'] = pand.to_datetime(df_copy['Date'], format='%Y/%m/%d', errors='coerce')
print("\nPrint doDataFrame após correção  para o formato data id 26 '20201226':")
print(df_copy)
print("=======================================================")
```

```
Print doDataFrame após correção  para o formato data id 26 '20201226':
    ID  Duration       Date  Pulse  Maxpulse  Calories
0    0        60 2020-12-01    110       130    4091.0
1    1        60 2020-12-02    117       145    4790.0
2    2        60 2020-12-03    103       135    3400.0
3    3        45 2020-12-04    109       175    2824.0
4    4        45 2020-12-05    117       148    4060.0
5    5        60 2020-12-06    102       127    3000.0
6    6        60 2020-12-07    110       136    3740.0
7    7       450 2020-12-08    104       134    2533.0
8    8        30 2020-12-09    109       133    1951.0
9    9        60 2020-12-10     98       124    2690.0
10  10        60 2020-12-11    103       147    3293.0
11  11        60 2020-12-12    100       120    2507.0
12  12        60 2020-12-12    100       120    2507.0
13  13        60 2020-12-13    106       128    3453.0
14  14        60 2020-12-14    104       132    3793.0
15  15        60 2020-12-15     98       123    2750.0
16  16        60 2020-12-16     98       120    2152.0
17  17        60 2020-12-17    100       120    3000.0
18  18        45 2020-12-18     90       112       0.0
19  19        60 2020-12-19    103       123    3230.0
20  20        45 2020-12-20     97       125    2430.0
21  21        60 2020-12-21    108       131    3642.0
22  22        45 1900-01-01    100       119    2820.0
23  23        60 2020-12-23    130       101    3000.0
24  24        45 2020-12-24    105       132    2460.0
25  25        60 2020-12-25    102       126    3345.0
26  26        60 2020-12-26    100       120    2500.0
27  27        60 2020-12-27     92       118    2410.0
28  28        60 2020-12-28    103       132       0.0
29  29        60 2020-12-29    100       132    2800.0
30  30        60 2020-12-30    102       129    3803.0
31  31        60 2020-12-31     92       115    2430.0
=======================================================
```

```python
# Transformando a coluna 'Date' para datetime
df_copy['Date'] = pand.to_datetime(df_copy['Date'], format='%Y/%m/%d', errors='coerce')
print("\nPrint do DataFrame após transformação da coluna 'Date' em datetime:")
print(df_copy)
print("=========================================================")
```

```
Print do DataFrame após transformação da coluna 'Date' em datetime:
    ID  Duration       Date  Pulse  Maxpulse  Calories
0    0        60 2020-12-01    110       130    4091.0
1    1        60 2020-12-02    117       145    4790.0
2    2        60 2020-12-03    103       135    3400.0
3    3        45 2020-12-04    109       175    2824.0
4    4        45 2020-12-05    117       148    4060.0
5    5        60 2020-12-06    102       127    3000.0
6    6        60 2020-12-07    110       136    3740.0
7    7       450 2020-12-08    104       134    2533.0
8    8        30 2020-12-09    109       133    1951.0
9    9        60 2020-12-10     98       124    2690.0
10  10        60 2020-12-11    103       147    3293.0
11  11        60 2020-12-12    100       120    2507.0
12  12        60 2020-12-12    100       120    2507.0
13  13        60 2020-12-13    106       128    3453.0
14  14        60 2020-12-14    104       132    3793.0
15  15        60 2020-12-15     98       123    2750.0
16  16        60 2020-12-16     98       120    2152.0
17  17        60 2020-12-17    100       120    3000.0
18  18        45 2020-12-18     90       112       0.0
19  19        60 2020-12-19    103       123    3230.0
20  20        45 2020-12-20     97       125    2430.0
21  21        60 2020-12-21    108       131    3642.0
22  22        45 1900-01-01    100       119    2820.0
23  23        60 2020-12-23    130       101    3000.0
24  24        45 2020-12-24    105       132    2460.0
25  25        60 2020-12-25    102       126    3345.0
26  26        60 2020-12-26    100       120    2500.0
27  27        60 2020-12-27     92       118    2410.0
28  28        60 2020-12-28    103       132       0.0
29  29        60 2020-12-29    100       132    2800.0
30  30        60 2020-12-30    102       129    3803.0
31  31        60 2020-12-31     92       115    2430.0
=========================================================
```

```python
# Mudando, na coluna Date, o valor ‘1900/01/01’ para ‘NaN’ - Not a Number
df_copy['Date'].replace(pand.Timestamp('1900-01-01'), pand.NaT, inplace=True)
print("\nPrint do DataFrame após alteração, na coluna Date, do valor '1900/01/01' para 'NaN' - Not a Number")
print(df_copy)
print("=========================================================")
```

```
Print do DataFrame após alteração, na coluna Date, do valor '1900/01/01' para 'NaN' - Not a Number
    ID  Duration       Date  Pulse  Maxpulse  Calories
0    0        60 2020-12-01    110       130    4091.0
1    1        60 2020-12-02    117       145    4790.0
2    2        60 2020-12-03    103       135    3400.0
3    3        45 2020-12-04    109       175    2824.0
4    4        45 2020-12-05    117       148    4060.0
5    5        60 2020-12-06    102       127    3000.0
6    6        60 2020-12-07    110       136    3740.0
7    7       450 2020-12-08    104       134    2533.0
8    8        30 2020-12-09    109       133    1951.0
9    9        60 2020-12-10     98       124    2690.0
10  10        60 2020-12-11    103       147    3293.0
11  11        60 2020-12-12    100       120    2507.0
12  12        60 2020-12-12    100       120    2507.0
13  13        60 2020-12-13    106       128    3453.0
14  14        60 2020-12-14    104       132    3793.0
15  15        60 2020-12-15     98       123    2750.0
16  16        60 2020-12-16     98       120    2152.0
17  17        60 2020-12-17    100       120    3000.0
18  18        45 2020-12-18     90       112       0.0
19  19        60 2020-12-19    103       123    3230.0
20  20        45 2020-12-20     97       125    2430.0
21  21        60 2020-12-21    108       131    3642.0
22  22        45        NaT    100       119    2820.0
23  23        60 2020-12-23    130       101    3000.0
24  24        45 2020-12-24    105       132    2460.0
25  25        60 2020-12-25    102       126    3345.0
26  26        60 2020-12-26    100       120    2500.0
27  27        60 2020-12-27     92       118    2410.0
28  28        60 2020-12-28    103       132       0.0
29  29        60 2020-12-29    100       132    2800.0
30  30        60 2020-12-30    102       129    3803.0
31  31        60 2020-12-31     92       115    2430.0
=========================================================
```

```python
# Excluindo os registros com valores nulos na coluna 'Date'
df_clean = df_copy.dropna(subset=['Date'])
print("\nPrint do DataFrame após remoção dos registros com valores nulos na coluna 'Date':")
print(df_clean)
print("============================================================")
```

```
Print do DataFrame após remoção dos registros com valores nulos na coluna 'Date':
    ID  Duration       Date  Pulse  Maxpulse  Calories
0    0        60 2020-12-01    110       130    4091.0
1    1        60 2020-12-02    117       145    4790.0
2    2        60 2020-12-03    103       135    3400.0
3    3        45 2020-12-04    109       175    2824.0
4    4        45 2020-12-05    117       148    4060.0
5    5        60 2020-12-06    102       127    3000.0
6    6        60 2020-12-07    110       136    3740.0
7    7       450 2020-12-08    104       134    2533.0
8    8        30 2020-12-09    109       133    1951.0
9    9        60 2020-12-10     98       124    2690.0
10  10        60 2020-12-11    103       147    3293.0
11  11        60 2020-12-12    100       120    2507.0
12  12        60 2020-12-12    100       120    2507.0
13  13        60 2020-12-13    106       128    3453.0
14  14        60 2020-12-14    104       132    3793.0
15  15        60 2020-12-15     98       123    2750.0
16  16        60 2020-12-16     98       120    2152.0
17  17        60 2020-12-17    100       120    3000.0
18  18        45 2020-12-18     90       112       0.0
19  19        60 2020-12-19    103       123    3230.0
20  20        45 2020-12-20     97       125    2430.0
21  21        60 2020-12-21    108       131    3642.0
23  23        60 2020-12-23    130       101    3000.0
24  24        45 2020-12-24    105       132    2460.0
25  25        60 2020-12-25    102       126    3345.0
26  26        60 2020-12-26    100       120    2500.0
27  27        60 2020-12-27     92       118    2410.0
28  28        60 2020-12-28    103       132       0.0
29  29        60 2020-12-29    100       132    2800.0
30  30        60 2020-12-30    102       129    3803.0
31  31        60 2020-12-31     92       115    2430.0
============================================================
```