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Trusted Python 3

Data Analysis Task - Dozee

Task 1 - Exploratory Data Analysis

```
In [1]: import pandas as pd  
%matplotlib inline  
import matplotlib as mpl  
import matplotlib.pyplot as plt  
  
In [2]: df_day1 = pd.read_csv("E:\Coursera\Work\Data Analysis Projects\Dozee\Data\csv_1.csv",delimiter=',')
```

Checking features of the data.

```
In [3]: df_day1.head()  
  
Out[3]:
```

	TimeStamp	HeartRate	BreathRate
0	1599419501	92.38	10.30
1	1599419531	92.38	16.97
2	1599419561	73.50	16.97
3	1599419591	76.38	16.97
4	1599419621	58.93	16.97

```
In [4]: df_day1.isnull().sum()  
  
Out[4]:
```

	TimeStamp	HeartRate	BreathRate
0	0	0	0
HeartRate	0		
BreathRate	0		
dtype: int64			

```
In [5]: df_day1.shape  
  
Out[5]: (984, 3)
```

```
In [6]: df_day1.dtypes  
  
Out[6]:
```

	TimeStamp	HeartRate	BreathRate
0	int64	float64	float64
HeartRate			
BreathRate			
dtype: object			

```
In [7]: df_day1['TimeStamp'] = df_day1["TimeStamp"].astype(float)  
  
df_day1['TimeStamp']= pd.to_datetime(df_day1['TimeStamp'],unit='s')  
  
df_day1.head()
```

```
Out[7]:
```

	TimeStamp	HeartRate	BreathRate
0	2020-09-06 19:11:41	92.38	10.30
1	2020-09-06 19:12:11	92.38	16.97
2	2020-09-06 19:12:41	73.50	16.97
3	2020-09-06 19:13:11	76.38	16.97
4	2020-09-06 19:13:41	58.93	16.97

```
In [8]: df_day1['date'] = [d.date() for d in df_day1['TimeStamp']]  
df_day1['time'] = [d.time() for d in df_day1['TimeStamp']]  
  
df_day1.head()
```

```
Out[8]:
```

	TimeStamp	HeartRate	BreathRate	date	time
0	2020-09-06 19:11:41	92.38	10.30	2020-09-06	19:11:41
1	2020-09-06 19:12:11	92.38	16.97	2020-09-06	19:12:11
2	2020-09-06 19:12:41	73.50	16.97	2020-09-06	19:12:41
3	2020-09-06 19:13:11	76.38	16.97	2020-09-06	19:13:11
4	2020-09-06 19:13:41	58.93	16.97	2020-09-06	19:13:41

```
In [9]: hr = df_day1.resample('H',on = 'TimeStamp').HeartRate.sum()  
hr.head()
```

```
Out[9]:
```

TimeStamp	HeartRate
2020-09-06 19:00:00	6684.80
2020-09-06 20:00:00	6782.12
2020-09-06 21:00:00	6677.35
2020-09-06 22:00:00	6803.72
2020-09-06 23:00:00	6428.37

Freq: H, Name: HeartRate, dtype: float64

```
In [10]: # Generating heartbeats according to hour windows (Non-overlapping)
```

```
... |>>> %%ipython --no-prompt --no-banner --no-captions --no-prompt-number --no-prompt-hints
```

```
In [11]: hr.count()
```

```
Out[11]: 9
```

```
In [12]: br = df_day1.resample('H',on = 'TimeStamp').BreathRate.sum()
```

```
br.head()
```

```
Out[12]: TimeStamp
```

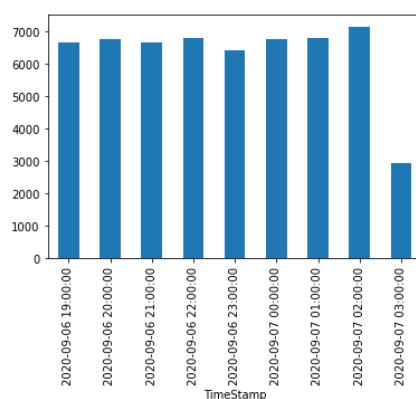
```
2020-09-06 19:00:00    1448.95
2020-09-06 20:00:00    1915.24
2020-09-06 21:00:00    2145.99
2020-09-06 22:00:00    1748.10
2020-09-06 23:00:00    2092.50
Freq: H, Name: BreathRate, dtype: float64
```

```
In [13]: br.count()
```

```
Out[13]: 9
```

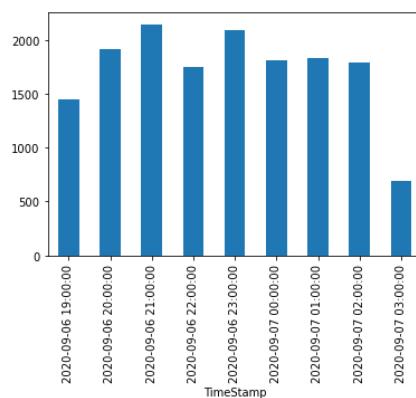
```
In [14]: br.plot.bar()
```

```
Out[14]: <matplotlib.axes._subplots.AxesSubplot at 0x1d4edc5f6d0>
```



```
In [15]: br.plot.bar()
```

```
Out[15]: <matplotlib.axes._subplots.AxesSubplot at 0x1d4edd285e0>
```



CSV 2

```
In [16]: df_day2 = pd.read_csv("E:\Coursera_Work\Data Analysis Projects\Dozee\Data\csv_2.csv",delimiter=',')
```

```
In [17]: df_day2.head()
```

```
Out[17]:
```

	TimeStamp	HeartRate	BreathRate
0	1599672348	77.21	20.27
1	1599672378	74.43	17.02
2	1599672408	72.34	14.27
3	1599672438	72.34	14.27
4	1599672468	74.82	14.27

```
In [18]: df_day2.isnull().sum()
```

```
Out[18]: TimeStamp      0
HeartRate      0
BreathRate      0
dtype: int64
```

```
In [19]: df_day2['TimeStamp'] = df_day2["TimeStamp"].astype(float)
df_day2['TimeStamp']= pd.to_datetime(df_day2['TimeStamp'],unit='s')
df_day2.head()
```

```
Out[19]:
```

	TimeStamp	HeartRate	BreathRate
0	2020-09-09 17:25:48	77.21	20.27
1	2020-09-09 17:26:18	74.43	17.02
2	2020-09-09 17:26:48	72.34	14.27
3	2020-09-09 17:27:18	72.34	14.27
4	2020-09-09 17:27:48	74.82	14.27

```
In [20]: df_day2['date'] = [d.date() for d in df_day2['TimeStamp']]
df_day2['time'] = [d.time() for d in df_day2['TimeStamp']]
df_day2.head()
```

Out[20]:

	TimeStamp	HeartRate	BreathRate	date	time
0	2020-09-09 17:25:48	77.21	20.27	2020-09-09	17:25:48
1	2020-09-09 17:26:18	74.43	17.02	2020-09-09	17:26:18
2	2020-09-09 17:26:48	72.34	14.27	2020-09-09	17:26:48
3	2020-09-09 17:27:18	72.34	14.27	2020-09-09	17:27:18
4	2020-09-09 17:27:48	74.82	14.27	2020-09-09	17:27:48

```
In [21]: hr = df_day2.resample('H',on = 'TimeStamp').HeartRate.sum()
br = df_day2.resample('H',on = 'TimeStamp').BreathRate.sum()
```

```
In [22]: hr.head()
```

Out[22]:

```
TimeStamp
2020-09-09 17:00:00    4857.12
2020-09-09 18:00:00    7799.26
2020-09-09 19:00:00    7467.19
2020-09-09 20:00:00    7212.32
2020-09-09 21:00:00    6843.33
Freq: H, Name: HeartRate, dtype: float64
```

```
In [23]: br.head()
```

Out[23]:

```
TimeStamp
2020-09-09 17:00:00    1025.82
2020-09-09 18:00:00    1881.32
2020-09-09 19:00:00    1883.04
2020-09-09 20:00:00    1967.39
2020-09-09 21:00:00    1851.40
Freq: H, Name: BreathRate, dtype: float64
```

```
In [24]: print(hr.count())
print(br.count())
```

```
9
9
```

```
In [25]: hr.plot.bar()
```

Out[25]:

TimeStamp	Count
2020-09-09 17:00:00	4857.12
2020-09-09 18:00:00	7799.26
2020-09-09 19:00:00	7467.19
2020-09-09 20:00:00	7212.32
2020-09-09 21:00:00	6843.33
2020-09-09 22:00:00	6542.00
2020-09-09 23:00:00	6712.00
2020-09-10 00:00:00	6612.00
2020-09-10 01:00:00	6142.00

Out[25]: <matplotlib.axes._subplots.AxesSubplot at 0x1d4eddbe10>

```
In [26]: br.plot.bar()
```

Out[26]:

TimeStamp	Count
2020-09-09 17:00:00	1025.82
2020-09-09 18:00:00	1881.32
2020-09-09 19:00:00	1883.04
2020-09-09 20:00:00	1967.39
2020-09-09 21:00:00	1851.40
2020-09-09 22:00:00	1764.00
2020-09-09 23:00:00	1764.00
2020-09-10 00:00:00	1712.00
2020-09-10 01:00:00	1664.00

Out[26]: <matplotlib.axes._subplots.AxesSubplot at 0x1d4eddc57c0>

CSV 3

```
In [27]: df_day3 = pd.read_csv("E:\Coursera_Work\Data_Analysis_Projects\Dozee\Data\csv_3.csv", delimiter=',')
```

```
In [28]: df_day3.head()
```

Out[28]:

	TimeStamp	HeartRate	BreathRate
0	1603469614	74.68	9.80
1	1603469644	61.64	9.92
2	1603469674	69.17	9.92
3	1603469704	85.65	9.92
4	1603469734	57.59	9.92

```
In [29]: df_day3.isnull().sum()
```

```
Out[29]: TimeStamp      0
HeartRate      0
BreathRate      0
dtype: int64
```

```
In [30]: df_day3['TimeStamp'] = df_day3["TimeStamp"].astype(float)
df_day3['TimeStamp']= pd.to_datetime(df_day3['TimeStamp'],unit='s')
df_day3.head()
```

Out[30]:

	TimeStamp	HeartRate	BreathRate
0	2020-10-23 16:13:34	74.68	9.80
1	2020-10-23 16:14:04	61.64	9.92
2	2020-10-23 16:14:34	69.17	9.92
3	2020-10-23 16:15:04	85.65	9.92
4	2020-10-23 16:15:34	57.59	9.92

```
In [31]: df_day3['date'] = [d.date() for d in df_day3['TimeStamp']]
df_day3['time'] = [d.time() for d in df_day3['TimeStamp']]
df_day3.head()
```

Out[31]:

	TimeStamp	HeartRate	BreathRate	date	time
0	2020-10-23 16:13:34	74.68	9.80	2020-10-23	16:13:34
1	2020-10-23 16:14:04	61.64	9.92	2020-10-23	16:14:04
2	2020-10-23 16:14:34	69.17	9.92	2020-10-23	16:14:34
3	2020-10-23 16:15:04	85.65	9.92	2020-10-23	16:15:04
4	2020-10-23 16:15:34	57.59	9.92	2020-10-23	16:15:34

```
In [32]: hr = df_day3.resample('H',on = 'TimeStamp').HeartRate.sum()
br = df_day3.resample('H',on = 'TimeStamp').BreathRate.sum()
```

```
In [33]: print(hr.head())
print(br.head())
```

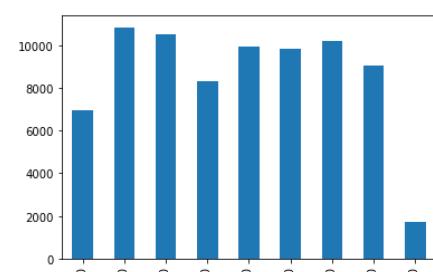
```
TimeStamp
2020-10-23 16:00:00    6975.88
2020-10-23 17:00:00    10860.36
2020-10-23 18:00:00    10536.96
2020-10-23 19:00:00    8317.03
2020-10-23 20:00:00    9930.86
Freq: H, Name: HeartRate, dtype: float64
TimeStamp
2020-10-23 16:00:00    1281.08
2020-10-23 17:00:00    2274.58
2020-10-23 18:00:00    2263.33
2020-10-23 19:00:00    1770.66
2020-10-23 20:00:00    2220.71
Freq: H, Name: BreathRate, dtype: float64
```

```
In [34]: print(hr.count())
print(br.count())
```

```
9
9
```

```
In [35]: hr.plot.bar()
```

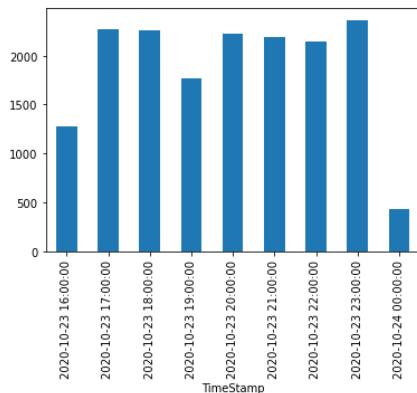
Out[35]: <matplotlib.axes._subplots.AxesSubplot at 0x1d4ede6a30>



```
2020-10-23 16:00:00<
2020-10-23 17:00:00<
2020-10-23 18:00:00<
2020-10-23 19:00:00<
2020-10-23 20:00:00<
2020-10-23 21:00:00<
2020-10-23 22:00:00<
2020-10-23 23:00:00<
2020-10-24 00:00:00<
```

In [36]: `br.plot.bar()`

Out[36]: <matplotlib.axes._subplots.AxesSubplot at 0x1d4edf07a00>



CSV 4

In [37]: `df_day4 = pd.read_csv("E:\Coursera_Work\Data Analysis Projects\Dozee\Dozee\csv_4.csv", delimiter=',')`

In [38]: `df_day4.head()`

Out[38]:

	TimeStamp	HeartRate	BreathRate
0	1602181820	101.57	13.70
1	1602181850	103.04	17.67
2	1602181880	79.84	17.67
3	1602181910	106.87	17.67
4	1602181940	106.21	17.67

In [39]: `df_day4.isnull().sum()`

Out[39]:

TimeStamp	0
HeartRate	0
BreathRate	0
dtype:	int64

In [40]: `df_day4['TimeStamp'] = df_day4["TimeStamp"].astype(float)`
`df_day4['TimeStamp']= pd.to_datetime(df_day4['TimeStamp'],unit='s')`
`df_day4.head()`

Out[40]:

	TimeStamp	HeartRate	BreathRate
0	2020-10-08 18:30:20	101.57	13.70
1	2020-10-08 18:30:50	103.04	17.67
2	2020-10-08 18:31:20	79.84	17.67
3	2020-10-08 18:31:50	106.87	17.67
4	2020-10-08 18:32:20	106.21	17.67

In [41]: `hr = df_day4.resample('H',on = 'TimeStamp').HeartRate.sum()`
`br = df_day4.resample('H',on = 'TimeStamp').BreathRate.sum()`
`print(hr.head())`
`print(br.head())`

TimeStamp

2020-10-08 18:00:00	5863.09
2020-10-08 19:00:00	11813.71
2020-10-08 20:00:00	11267.35
2020-10-08 21:00:00	10727.42
2020-10-08 22:00:00	10128.06

Freq: H, Name: HeartRate, dtype: float64

TimeStamp

2020-10-08 18:00:00	1203.76
2020-10-08 19:00:00	1981.95
2020-10-08 20:00:00	1939.54
2020-10-08 21:00:00	1825.40
2020-10-08 22:00:00	1901.36

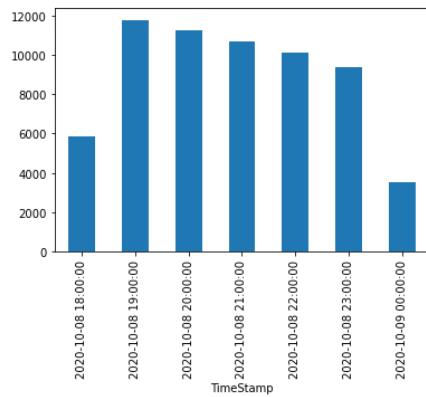
Freq: H, Name: BreathRate, dtype: float64

In [42]: `print(hr.count())`
`print(br.count())`

7
7

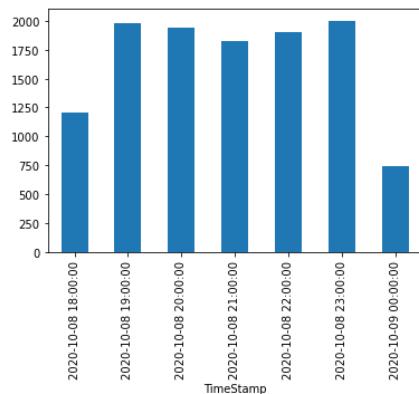
In [43]: `hr.plot.bar()`

Out[43]: <matplotlib.axes._subplots.AxesSubplot at 0x1d4edf48880>



In [44]: `br.plot.bar()`

Out[44]: <matplotlib.axes._subplots.AxesSubplot at 0x1d4eefba070>



CSV 5

In [45]: `df_day5 = pd.read_csv("E:\Coursera\Work\Data Analysis Projects\Dozee\Data\csv_5.csv", delimiter=',')`

In [46]: `df_day5.head()`

Out[46]:

	TimeStamp	HeartRate	BreathRate
0	1603386328	72.59	17.79
1	1603386358	72.37	16.99
2	1603386388	73.49	17.06
3	1603386418	73.20	17.58
4	1603386448	74.86	17.54

In [47]: `df_day5.isnull().sum()`

Out[47]:

```
TimeStamp      0
HeartRate      0
BreathRate     0
dtype: int64
```

In [48]: `df_day5['TimeStamp'] = df_day5['TimeStamp'].astype(float)
df_day5['TimeStamp'] = pd.to_datetime(df_day5['TimeStamp'], unit='s')
df_day5.head()`

Out[48]:

	TimeStamp	HeartRate	BreathRate
0	2020-10-22 17:05:28	72.59	17.79
1	2020-10-22 17:05:58	72.37	16.99
2	2020-10-22 17:06:28	73.49	17.06
3	2020-10-22 17:06:58	73.20	17.58
4	2020-10-22 17:07:28	74.86	17.54

In [49]: `hr = df_day4.resample('H', on = 'TimeStamp').HeartRate.sum()
br = df_day4.resample('H', on = 'TimeStamp').BreathRate.sum()
print(hr.head())
print(br.head())`

```
TimeStamp
2020-10-08 18:00:00      5863.09
2020-10-08 19:00:00     11813.71
2020-10-08 20:00:00     11267.35
2020-10-08 21:00:00     10727.42
2020-10-08 22:00:00     10120.06
Freq: H, Name: HeartRate, dtype: float64
TimeStamp
2020-10-08 18:00:00     1203.76
2020-10-08 19:00:00     1981.95
2020-10-08 20:00:00     1939.54
```

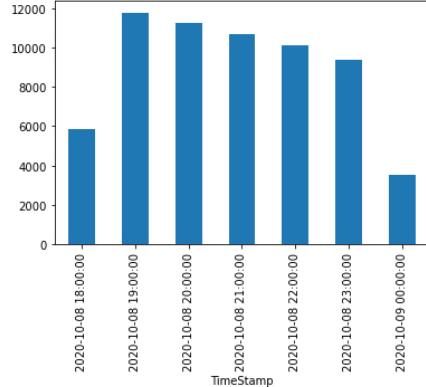
```
-->----->
2020-10-08 21:00:00    1825.40
2020-10-08 22:00:00    1901.36
Freq: H, Name: BreathRate, dtype: float64
```

```
In [50]: print(hr.count())
print(br.count())
```

```
7
7
```

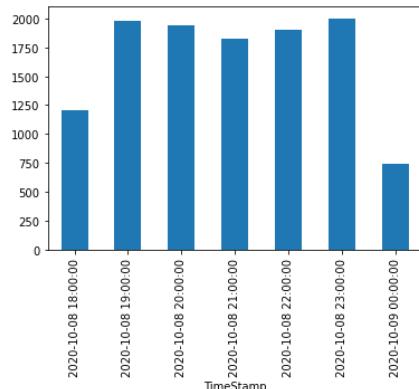
```
In [51]: hr.plot.bar()
```

```
Out[51]: <matplotlib.axes._subplots.AxesSubplot at 0x1d4ef02a340>
```



```
In [52]: br.plot.bar()
```

```
Out[52]: <matplotlib.axes._subplots.AxesSubplot at 0x1d4ef09ea60>
```



Day 6

```
In [53]: df_day6 = pd.read_csv("E:\Coursera_Work\Data Analysis Projects\Dozee\Data\csv_6.csv", delimiter=',')
```

```
In [54]: df_day6.head()
```

```
Out[54]:
   TimeStamp  HeartRate  BreathRate
0  1602607071     62.50     22.80
1  1602607101     87.57     21.87
2  1602607131     89.42     21.58
3  1602607161     86.75     21.58
4  1602607191     86.75     21.58
```

```
In [55]: df_day6.isnull().sum()
```

```
Out[55]:
TimeStamp      0
HeartRate      0
BreathRate      0
dtype: int64
```

```
In [56]: df_day6['TimeStamp'] = df_day6['TimeStamp'].astype(float)
df_day6['TimeStamp']= pd.to_datetime(df_day6['TimeStamp'],unit='s')
df_day6.head(4)
```

```
Out[56]:
   TimeStamp  HeartRate  BreathRate
0  2020-10-13 16:37:51     62.50     22.80
1  2020-10-13 16:38:21     87.57     21.87
2  2020-10-13 16:38:51     89.42     21.58
3  2020-10-13 16:39:21     86.75     21.58
4  2020-10-13 16:39:51     86.75     21.58
```

```
In [57]: hr = df_day6.resample('H',on = 'TimeStamp').HeartRate.sum()
```

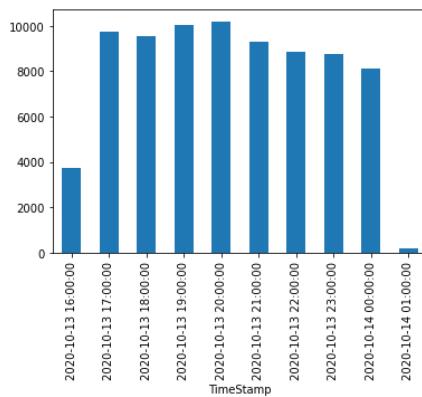
```
br = df_day6.resample('H',on = 'TimeStamp').BreathRate.sum()  
In [58]: print(hr.head())  
print(br.head())
```

```
TimeStamp  
2020-10-13 16:00:00    3734.64  
2020-10-13 17:00:00    9752.96  
2020-10-13 18:00:00    9530.87  
2020-10-13 19:00:00    10036.58  
2020-10-13 20:00:00    10207.88  
Freq: H, Name: HeartRate, dtype: float64  
TimeStamp  
2020-10-13 16:00:00    988.88  
2020-10-13 17:00:00    2318.29  
2020-10-13 18:00:00    2130.08  
2020-10-13 19:00:00    1990.57  
2020-10-13 20:00:00    2067.62  
Freq: H, Name: BreathRate, dtype: float64
```

```
In [59]: print(hr.count(),br.count())  
10 10
```

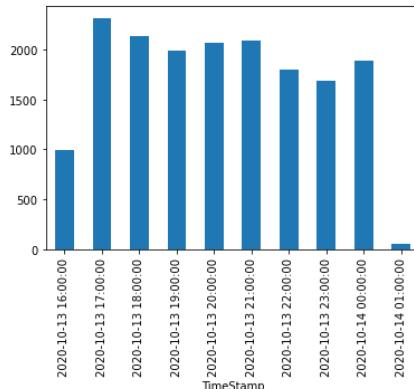
```
In [60]: hr.plot.bar()
```

```
Out[60]: <matplotlib.axes._subplots.AxesSubplot at 0x1d4ef10edf0>
```



```
In [61]: br.plot.bar()
```

```
Out[61]: <matplotlib.axes._subplots.AxesSubplot at 0x1d4ef1719d0>
```



Day 7

```
In [62]: df_day7 = pd.read_csv("E:\Coursera_Work\Data Analysis Projects\Dozee\Data\csv_7.csv",delimiter=',')
```

```
In [63]: df_day7.head()
```

```
Out[63]:
```

	TimeStamp	HeartRate	BreathRate
0	1603640925	75.58	11.35
1	1603640955	76.44	21.04
2	1603640985	87.62	11.20
3	1603641015	87.62	15.32
4	1603641045	87.62	16.22

```
In [64]: df_day7.isnull().sum()
```

```
Out[64]:
```

TimeStamp	0
HeartRate	0
BreathRate	0
dtype: int64	

```
In [65]: df_day7['TimeStamp'] = df_day7['TimeStamp'].astype(float)  
df_day7['TimeStamp']= pd.to_datetime(df_day7['TimeStamp'],unit='s')
```

```
df_day7.head()
```

Out[65]:

	TimeStamp	HeartRate	BreathRate
0	2020-10-25 15:48:45	75.58	11.35
1	2020-10-25 15:49:15	76.44	21.04
2	2020-10-25 15:49:45	87.62	11.20
3	2020-10-25 15:50:15	87.62	15.32
4	2020-10-25 15:50:45	87.62	16.22

```
In [66]: hr = df_day7.resample('H',on = 'TimeStamp').HeartRate.sum()  
br = df_day7.resample('H',on = 'TimeStamp').BreathRate.sum()  
print(hr.head())  
print(br.head())
```

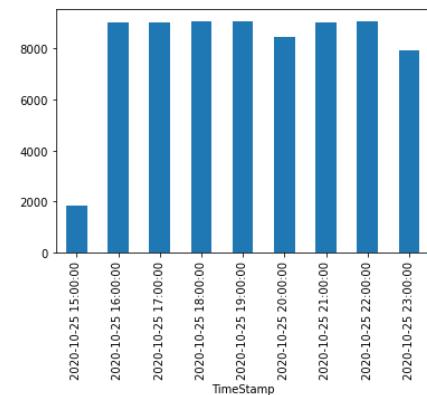
```
TimeStamp  
2020-10-25 15:00:00    1808.67  
2020-10-25 16:00:00    9048.25  
2020-10-25 17:00:00    9847.05  
2020-10-25 18:00:00    9870.61  
2020-10-25 19:00:00    9892.02  
Freq: H, Name: HeartRate, dtype: float64  
TimeStamp  
2020-10-25 15:00:00    414.13  
2020-10-25 16:00:00    2173.49  
2020-10-25 17:00:00    2121.28  
2020-10-25 18:00:00    2187.68  
2020-10-25 19:00:00    2062.51  
Freq: H, Name: BreathRate, dtype: float64
```

```
In [67]: print(hr.count(),br.count())
```

9 9

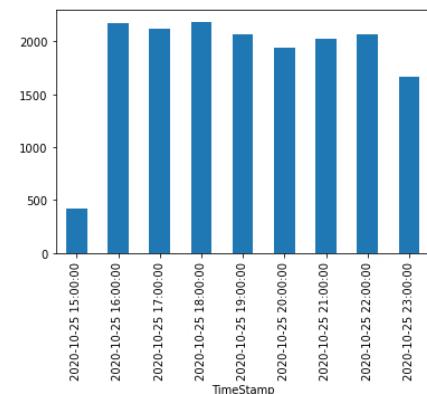
```
In [68]: hr.plot.bar()
```

Out[68]: <matplotlib.axes._subplots.AxesSubplot at 0x1d4ef1f8c10>



```
In [69]: br.plot.bar()
```

Out[69]: <matplotlib.axes._subplots.AxesSubplot at 0x1d4ef261b80>



Day 8

```
In [70]: df_day8 = pd.read_csv("E:\Coursera_Work\Data Analysis Projects\Dozee\Data\csv_8.csv",delimiter=',')
```

```
In [71]: df_day8.head()
```

Out[71]:

	TimeStamp	HeartRate	BreathRate
0	1603649540	46.16	9.53
1	1603649570	46.16	9.53
2	1603649600	46.16	9.53
3	1603649630	46.16	9.53

```
4 1603649660 46.16 9.53
```

```
In [72]: df_day8.isnull().sum()
```

```
Out[72]: Timestamp    0  
HeartRate     0  
BreathRate    0  
dtype: int64
```

```
In [73]: df_day8['TimeStamp'] = df_day8['TimeStamp'].astype(float)  
df_day8['TimeStamp']= pd.to_datetime(df_day8['TimeStamp'],unit='s')  
df_day8.head()
```

```
Out[73]:
```

	TimeStamp	HeartRate	BreathRate
0	2020-10-25 18:12:20	46.16	9.53
1	2020-10-25 18:12:50	46.16	9.53
2	2020-10-25 18:13:20	46.16	9.53
3	2020-10-25 18:13:50	46.16	9.53
4	2020-10-25 18:14:20	46.16	9.53

```
In [74]: hr = df_day8.resample('H',on = 'TimeStamp').HeartRate.sum()  
br = df_day8.resample('H',on = 'TimeStamp').BreathRate.sum()  
print(hr.count(),br.count())
```

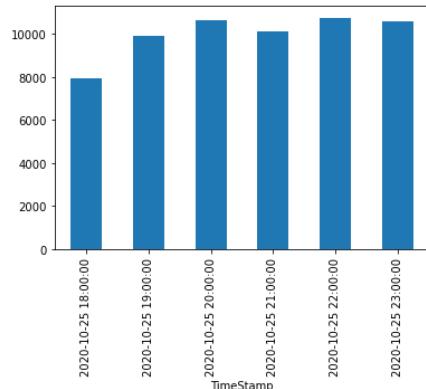
```
6 6
```

```
In [75]: print(hr.head())  
print(br.head())
```

```
Timestamp  
2020-10-25 18:00:00    7937.65  
2020-10-25 19:00:00    9887.89  
2020-10-25 20:00:00   10634.80  
2020-10-25 21:00:00   10118.44  
2020-10-25 22:00:00   10761.97  
Freq: H, Name: HeartRate, dtype: float64  
TimeStamp  
2020-10-25 18:00:00    3273.50  
2020-10-25 19:00:00    3155.71  
2020-10-25 20:00:00    3422.30  
2020-10-25 21:00:00    2997.88  
2020-10-25 22:00:00    3621.91  
Freq: H, Name: BreathRate, dtype: float64
```

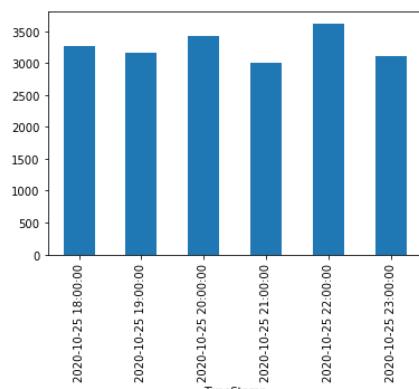
```
In [76]: hr.plot.bar()
```

```
Out[76]: <matplotlib.axes._subplots.AxesSubplot at 0x1d4ef2cd8e0>
```



```
In [77]: br.plot.bar()
```

```
Out[77]: <matplotlib.axes._subplots.AxesSubplot at 0x1d4ef337be0>
```



```
In [78]: df_day9 = pd.read_csv("E:\Coursera_Work\Da ta Analysis Projects\Dozee\Da ta\csv_9.csv",delimiter=',')
```

```
In [79]: df_day9.head()
```

```
Out[79]:
```

	TimeStamp	HeartRate	BreathRate
0	1603474356	81.56	9.94
1	1603474386	81.56	10.83
2	1603474416	80.17	10.18
3	1603474446	80.86	17.79
4	1603474476	77.68	17.79

```
In [80]: df_day9.isnull().sum()
```

```
Out[80]: TimeStamp      0  
HeartRate      0  
BreathRate     0  
dtype: int64
```

```
In [81]: df_day9['TimeStamp'] = df_day9["TimeStamp"].astype(float)  
df_day9['TimeStamp']= pd.to_datetime(df_day9['TimeStamp'],unit='s')  
df_day9.head(4)
```

```
Out[81]:
```

	TimeStamp	HeartRate	BreathRate
0	2020-10-23 17:32:36	81.56	9.94
1	2020-10-23 17:33:06	81.56	10.83
2	2020-10-23 17:33:36	80.17	10.18
3	2020-10-23 17:34:06	80.86	17.79
4	2020-10-23 17:34:36	77.68	17.79

```
In [82]: hr = df_day9.resample('H',on = 'TimeStamp').HeartRate.sum()  
br = df_day9.resample('H',on = 'TimeStamp').BreathRate.sum()  
print(hr.count(),br.count())
```

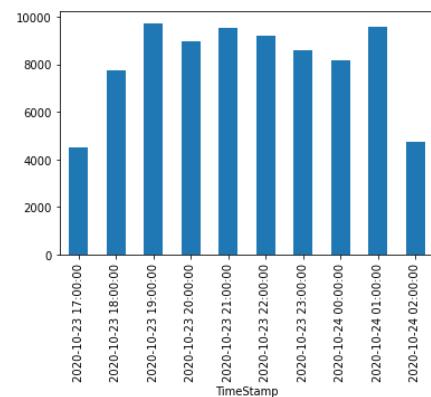
```
10 10
```

```
In [83]: print(hr.head())  
print(br.head())
```

```
TimeStamp  
2020-10-23 17:00:00    4497.70  
2020-10-23 18:00:00    7754.41  
2020-10-23 19:00:00    9736.61  
2020-10-23 20:00:00    8959.69  
2020-10-23 21:00:00    9533.25  
Freq: H, Name: HeartRate, dtype: float64  
TimeStamp  
2020-10-23 17:00:00    973.00  
2020-10-23 18:00:00    1597.52  
2020-10-23 19:00:00    2084.50  
2020-10-23 20:00:00    2309.17  
2020-10-23 21:00:00    2105.50  
Freq: H, Name: BreathRate, dtype: float64
```

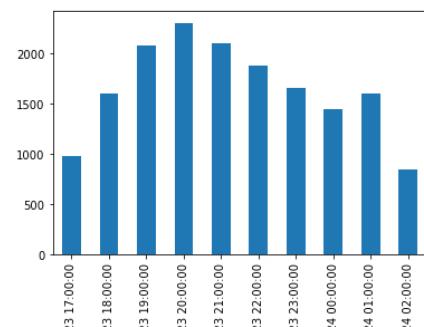
```
In [84]: hr.plot.bar()
```

```
Out[84]: <matplotlib.axes._subplots.AxesSubplot at 0x1d4ef39d250>
```



```
In [85]: br.plot.bar()
```

```
Out[85]: <matplotlib.axes._subplots.AxesSubplot at 0x1d4ef20c520>
```



```
2020-10 2020-10 2020-10 2020-10 2020-10 2020-10 2020-10 2020-10  
TimeStamp
```

```
In [86]: df_day10 = pd.read_csv("E:\Coursera_Work\Data Analysis Projects\Dozee\Data\csv_10.csv",delimiter=',')
```

```
In [87]: df_day10.head()
```

```
Out[87]:
```

	TimeStamp	HeartRate	BreathRate
0	1603556807	73.81	5.41
1	1603556837	73.81	18.63
2	1603556867	73.81	17.36
3	1603556897	73.81	15.77
4	1603556927	73.81	15.77

```
In [88]: df_day10.isnull().sum()
```

```
Out[88]: TimeStamp    0  
HeartRate    0  
BreathRate    0  
dtype: int64
```

```
In [89]: df_day10['TimeStamp'] = df_day10["TimeStamp"].astype(float)  
df_day10['TimeStamp']= pd.to_datetime(df_day10['TimeStamp'],unit='s')  
df_day10.head()
```

```
Out[89]:
```

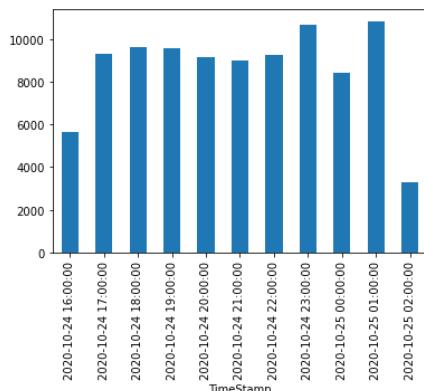
	TimeStamp	HeartRate	BreathRate
0	2020-10-24 16:26:47	73.81	5.41
1	2020-10-24 16:27:17	73.81	18.63
2	2020-10-24 16:27:47	73.81	17.36
3	2020-10-24 16:28:17	73.81	15.77
4	2020-10-24 16:28:47	73.81	15.77

```
In [90]: hr = df_day10.resample('H',on = 'TimeStamp').HeartRate.sum()  
br = df_day10.resample('H',on = 'TimeStamp').BreathRate.sum()  
print(hr.count(),br.count())  
print(hr.head())  
print(br.head())
```

```
11 11  
TimeStamp  
2020-10-24 16:00:00    5645.93  
2020-10-24 17:00:00    9333.04  
2020-10-24 18:00:00    9638.92  
2020-10-24 19:00:00    9570.56  
2020-10-24 20:00:00    9180.02  
Freq: H, Name: HeartRate, dtype: float64  
TimeStamp  
2020-10-24 16:00:00    1229.21  
2020-10-24 17:00:00    2069.58  
2020-10-24 18:00:00    1806.86  
2020-10-24 19:00:00    1879.52  
2020-10-24 20:00:00    1918.33  
Freq: H, Name: BreathRate, dtype: float64
```

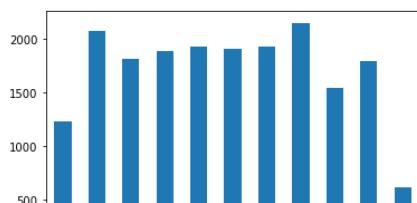
```
In [91]: hr.plot.bar()
```

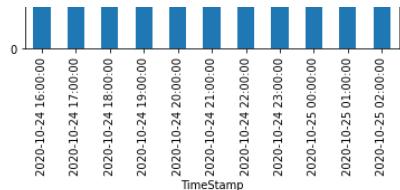
```
Out[91]: <matplotlib.axes._subplots.AxesSubplot at 0x1d4ef45a520>
```



```
In [92]: br.plot.bar()
```

```
Out[92]: <matplotlib.axes._subplots.AxesSubplot at 0x1d4ef4d3700>
```

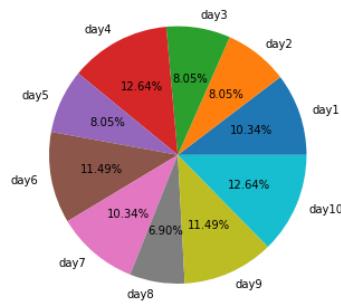




Task 2

```
In [93]: day = ["day1", "day2", "day3", "day4", "day5", "day6", "day7", "day8", "day9", "day10"]
sleep_hours = [9,7,7,11,7,10,9,6,10,11]
fig = plt.figure()
ax = fig.add_axes([0,0,1,1])
ax.axis('equal')
ax.pie(sleep_hours,labels = day, autopct='%1.2f%%')
plt.show
```

Out[93]: <function matplotlib.pyplot.show(*args, **kw)>



Sleep cycle of a person for 10 Days.

Divding classes based on no of sleep hours.

The Breathing Rate and HeartRate depicts same graph,hence revealing a direct relation between both the variables Normal breathing rate of a healthy person per hour is between 1200-1500 in a relaxed (Sleeping State) Normal Heart rate of a healthy person per hour is between 3000-4000 in a relaxed (sleeping State) while sleeping, your oxygen levels are lower and your carbon dioxide levels are higher because your level of breathing goes slightly down.

- 6 Hours - At day 8 : The HeartRate and Breathing Rate were above normal.
- 7 Hours - At day 2,3 and 5: The heartbeat and Breathrate were above normal.
- 9 Hours - At day 1 & 7 : The heartbeat and Breathrate were above normal.
- 10 Hours- At day 6 & 9: The heartbeat rate were above normal, but breathing was normal.
- 11 Hours- At day 4 & 10 : The heartbeat and Breath rate were above normal.

The Conclusion is that the person might have some irregularities in his sleep, and might be at a risk of serious illness.

In []: