Salsa_notebook

April 20, 2018

1 Salsa Science

The idea of this document is to understand the data collected from the client's assitance to the Salsa Colombiana workshops offered by Salsa Unicorns. Analyse the data, understand the trends and classify people into groups under certain criterion can give us a precise vision on where to move forward. This can help us to understand what the clients wants and in the marketing aspect we can offer them exactly what they are looking for.

```
In [1]: import pandas as pd
        from pandas import DataFrame, Series
        import matplotlib.pyplot as plt
        import numpy as np
        import seaborn as sns
        from collections import OrderedDict
```

```
In [93]: folder="/home/camilo/Documents/Data_Science_Courses/Salsa_Science/"
         df_liste = pd.read_csv(folder + '/Stats_Dataframe_Liste.csv')
```

```
In [94]: df_liste.head(5)
```

Out[94]:

	Nombre	Juli	August	September	Oktober	November	Dezember	Januar	Total
0	Alex Pimentel	1	0	2	0	0	0	0	3
1	Alex Weidner	1	0	0	1	0	0	0	2
2	Alexander Meier	0	4	0	0	0	0	0	4
3	Alina Wagner	1	0	2	0	0	0	0	3
4	Alonso Renard	0	0	0	1	0	0	0	1

2 Find out the number of new participants per month

```
In [86]: newJuli = df_liste['Juli'][df_liste['Juli']>0].count()
         newAugust = df_liste['August'][(df_liste['Juli']==0) & (df_liste['August']>0)].count()
```

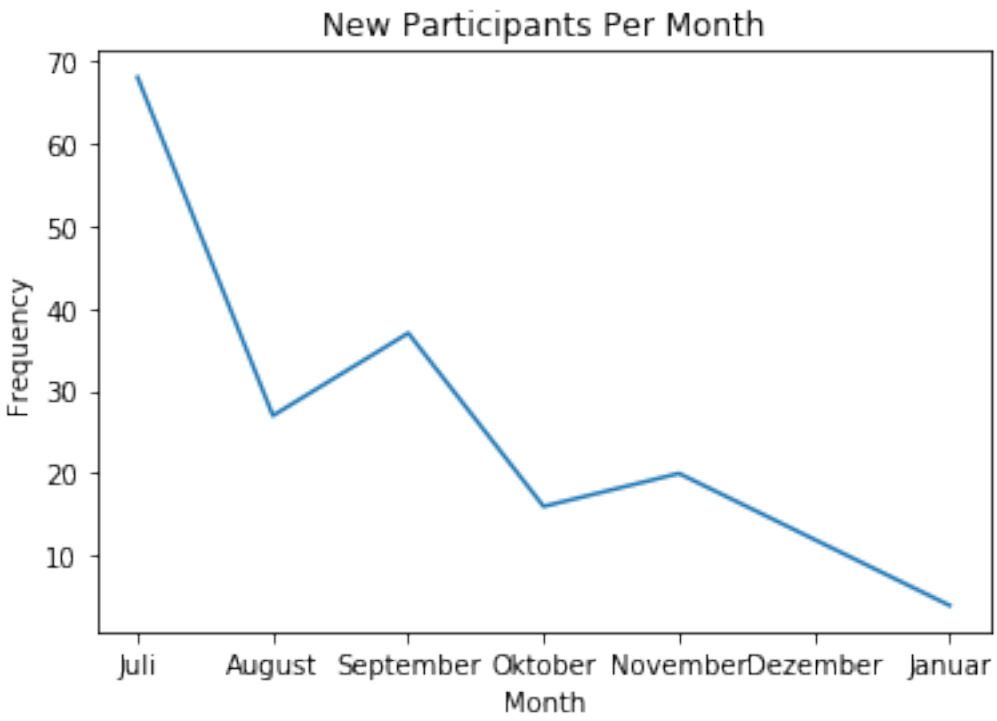
```
newSeptember = df_liste['September'][(df_liste['Juli']==0) & (df_liste['August']==0) &
                                     (df_liste['September']>0)].count()
newOktober = df_liste['Oktober'][(df_liste['Juli']==0) & (df_liste['August']==0) &
                                 (df_liste['September']==0) &
                                 (df_liste['Oktober']>0)].count()
newNovember = df_liste['November'][(df_liste['Juli']==0) & (df_liste['August']==0) &
                                   (df_liste['September']==0) &
                                   (df_liste['Oktober']==0) &
                                   (df_liste['November']>0)].count()
newDezember = df_liste['Dezember'][(df_liste['Juli']==0) & (df_liste['August']==0) &
                                   (df_liste['September']==0) &
                                   (df_liste['Oktober']==0) &
                                   (df_liste['November']==0) &
                                   (df_liste['Dezember']>0)].count()
newJanuar = df_liste['Januar'][(df_liste['Juli']==0) & (df_liste['August']==0) &
                               (df_liste['September']==0) & (df_liste['Oktober']==0) &
                               (df_liste['November']==0) & (df_liste['Dezember']==0) &
                               (df_liste['Januar']>0)].count()
```

In [87]:
```
DataFrame(OrderedDict([('NewJuli', newJuli), ('NewAugust', newAugust),
                       ('NewSeptember', newSeptember), ('NewOktober', newOktober),
                       ('NewNovember', newNovember), ('NewDezember', newDezember),
                       ('NewJanuar', newJanuar)]), index=['# of new Participants'])
```

Out[87]:

	NewJuli	NewAugust	NewSeptember	NewOktober	NewNovember	NewDezember	NewJanuar
# of new Participants	68	27	37	16	20	12	4

In [11]:
```
months = [7,8,9,10,11,12,13]
#names = list(newParticipants.columns)
values = list(newParticipants.loc[0])
names=['Juli','August','September','Oktober','November','Dezember','Januar']
plt.plot(months, values)
plt.xticks(months, names)
plt.title('New Participants Per Month')
plt.xlabel('Month')
plt.ylabel('Frequency')
plt.show()
```



3 Find out the number of participants who came different times per Month

```
In [12]: valuesJuli=df_liste['Juli'][df_liste['Juli']>0].value_counts()
         valuesAugust=df_liste['August'][df_liste['August']>0].value_counts()
         valuesSeptember=df_liste['September'][df_liste['September']>0].value_counts()
         valuesOktober=df_liste['Oktober'][df_liste['Oktober']>0].value_counts()
         valuesNovember=df_liste['November'][df_liste['November']>0].value_counts()
         valuesDezember=df_liste['Dezember'][df_liste['Dezember']>0].value_counts()
         valuesJanuar=df_liste['Januar'][df_liste['Januar']>0].value_counts()

In [13]: assistanceNumberTable=pd.concat([valuesJuli, valuesAugust, valuesSeptember,
                                          valuesOktober, valuesNovember, valuesDezember,
                                          valuesJanuar], axis=1)

In [14]: assistanceNumberTable

Out[14]:
```

	Juli	August	September	Oktober	November	Dezember	Januar
1	41.0	28.0	26.0	26.0	30.0	33.0	14.0
2	8.0	13.0	31.0	22.0	15.0	21.0	12.0
3	11.0	4.0	11.0	11.0	14.0	1.0	5.0
4	4.0	5.0	7.0	6.0	7.0	3.0	NaN
5	4.0	1.0	7.0	2.0	3.0	4.0	NaN

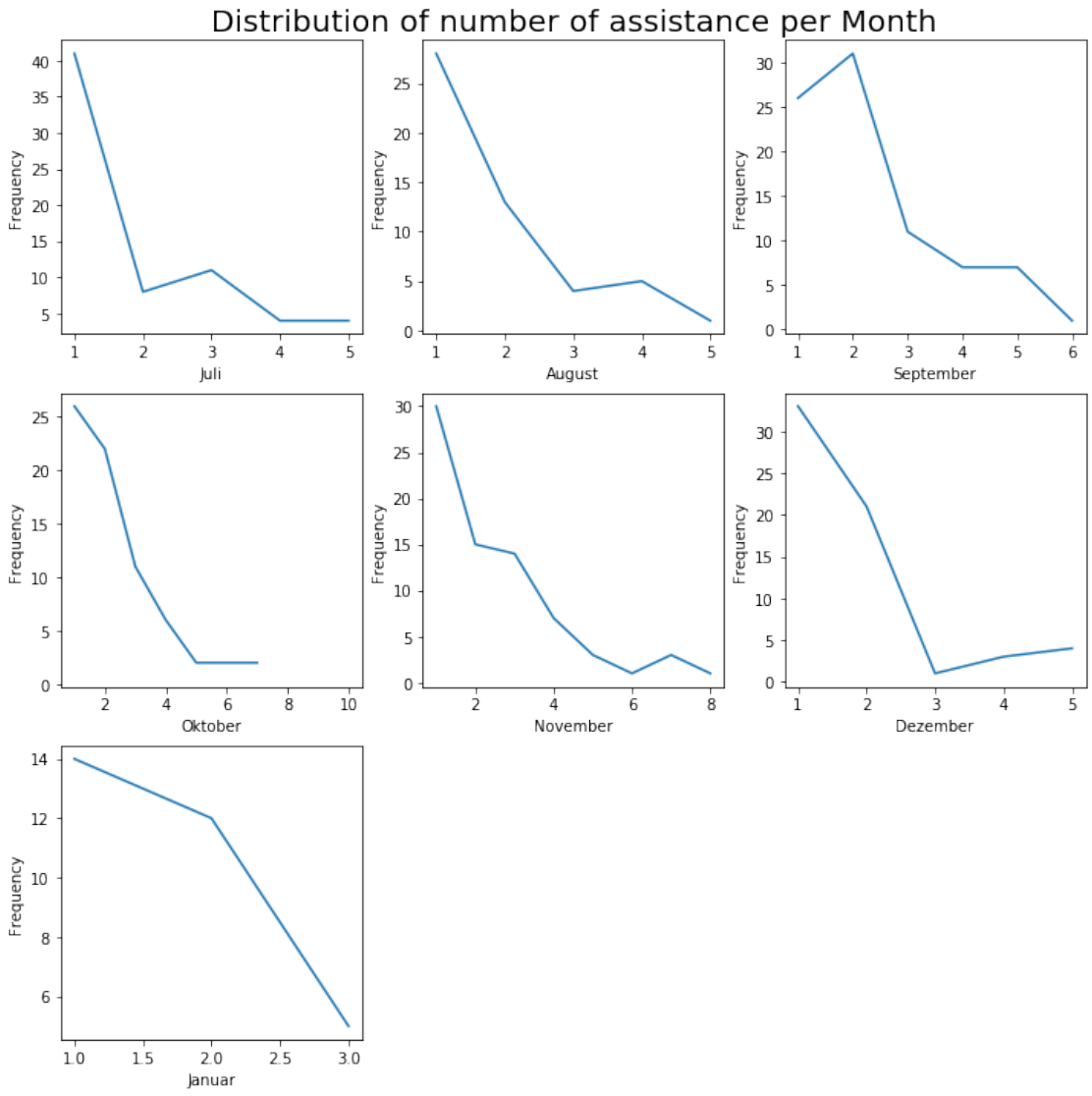
```
6    NaN     NaN        1.0      2.0       1.0       NaN     NaN
7    NaN     NaN        NaN      2.0       3.0       NaN     NaN
8    NaN     NaN        NaN      NaN       1.0       NaN     NaN
10   NaN     NaN        NaN      1.0       NaN       NaN     NaN
```

In [15]:
```
fig = plt.gcf().set_size_inches(12, 12)
x=assistanceNumberTable.index
y=assistanceNumberTable.Juli
plt.subplot(331)
plt.plot(x, y)
plt.xlabel('Juli')
plt.ylabel('Frequency')

y=assistanceNumberTable.August
plt.subplot(332)
plt.plot(x, y)
plt.xlabel('August')
plt.title('Distribution of number of assistance per Month', fontsize=20)
plt.ylabel('Frequency')

y=assistanceNumberTable.September
plt.subplot(333)
plt.plot(x, y)
plt.xlabel('September')
plt.ylabel('Frequency')

y=assistanceNumberTable.Oktober
plt.subplot(334)
plt.plot(x, y)
plt.xlabel('Oktober')
plt.ylabel('Frequency')

y=assistanceNumberTable.November
plt.subplot(335)
plt.plot(x, y)
plt.xlabel('November')
plt.ylabel('Frequency')

y=assistanceNumberTable.Dezember
plt.subplot(336)
plt.plot(x, y)
plt.xlabel('Dezember')
plt.ylabel('Frequency')

y=assistanceNumberTable.Januar
plt.subplot(337)
plt.plot(x, y)
plt.xlabel('Januar')
```

```
        plt.ylabel('Frequency')
```

```
/usr/local/lib/python2.7/dist-packages/pandas/core/computation/check.py:17: UserWarning: The ins
The minimum supported version is 2.4.6

  ver=ver, min_ver=_MIN_NUMEXPR_VERSION), UserWarning)
```

Out[15]: <matplotlib.text.Text at 0x7f63710a2690>



4 Filter out the people that came in June, since June is not taken into account for calculations

Although the June column is not there, the names of the people who came only in June and not anymore is there. In order to filtrate out these people, it is enough to look at the total column = 0. This means these people came only in June and did not come back anymore.

```
In [16]: df_filter = df_liste.drop(df_liste[df_liste.Total == 0].index)
```

```
In [82]: df_filter.head(5)
```

Out[82]:

	Nombre	Juli	August	September	Oktober	November	Dezember	Januar	Total
0	Alex Pimentel	1	0	2	0	0	0	0	3
1	Alex Weidner	1	0	0	1	0	0	0	2
2	Alexander Meier	0	4	0	0	0	0	0	4
3	Alina Wagner	1	0	2	0	0	0	0	3
4	Alonso Renard	0	0	0	1	0	0	0	1

```
In [18]: assisOne=df_liste['Total'][df_liste['Total']==1].count()
         assisTwo=df_liste['Total'][df_liste['Total']==2].count()
         assisThree=df_liste['Total'][df_liste['Total']==3].count()
         assisFour=df_liste['Total'][df_liste['Total']==4].count()
         assisFive=df_liste['Total'][df_liste['Total']==5].count()
         assisSix=df_liste['Total'][df_liste['Total']==6].count()
         assisSeven=df_liste['Total'][df_liste['Total']==7].count()
         assisEight=df_liste['Total'][df_liste['Total']==8].count()
         assisGreater8=df_liste['Total'][df_liste['Total']>8].count()
```

5 Find out the Number of Assistance for the whole period of six months

```
In [90]: DataFrame(OrderedDict([('OneTime', assisOne), ('TwoTimes', assisTwo),
                               ('ThreeTimes', assisThree), ('FourTimes', assisFour),
                               ('FiveTimes', assisFive), ('SixTimes', assisSix),
                               ('SevenTimes', assisSeven), ('EightTimes', assisEight),
                               ('Greater8Times', assisGreater8)]),
                               index=['Number of Assistance'])
```

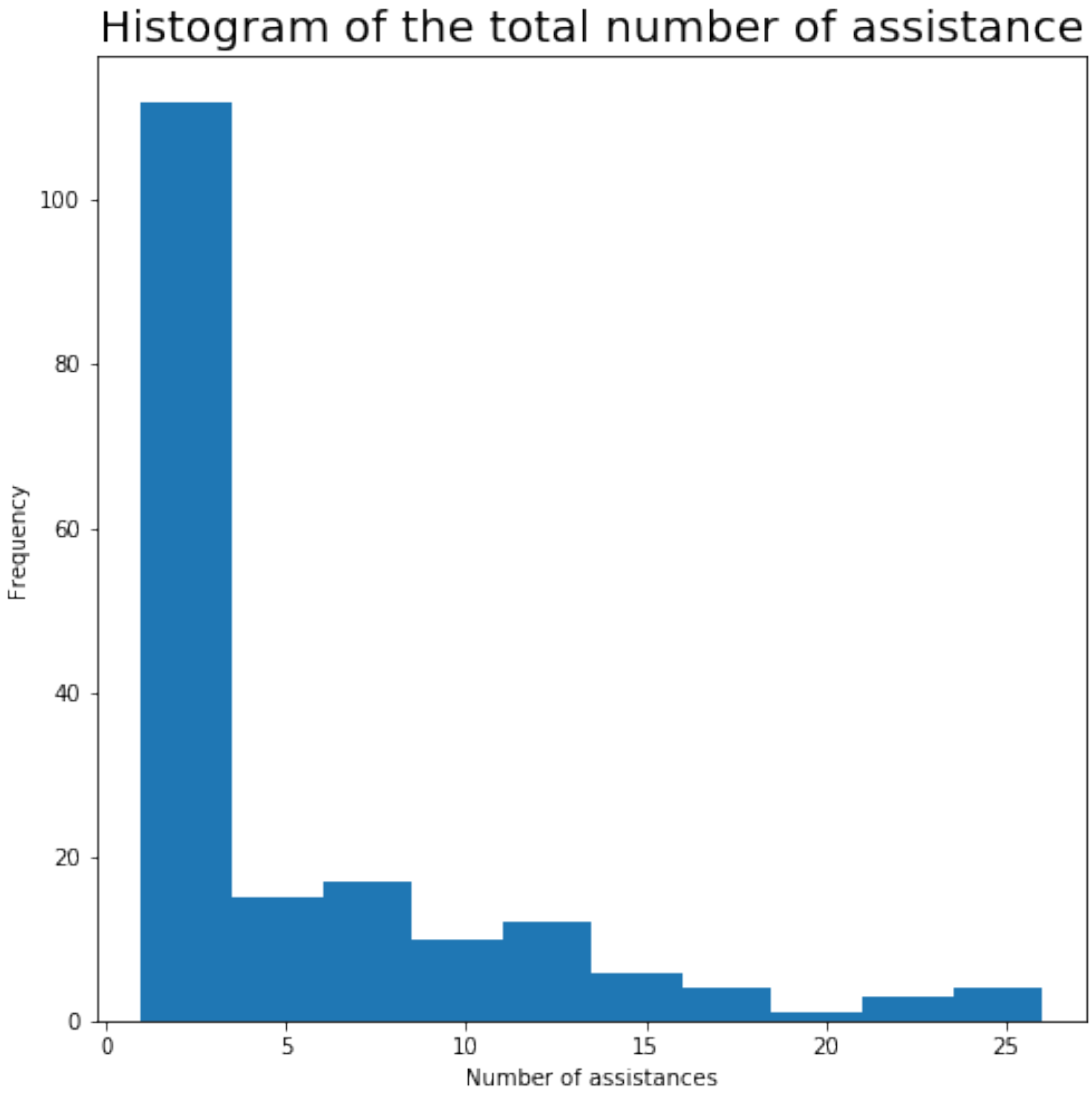
Out[90]:

	OneTime	TwoTimes	ThreeTimes	FourTimes	FiveTimes
Number of Assistance	78	20	14	6	9

```
                          SixTimes  SevenTimes  EightTimes  Greater8Times
Number of Assistance             7           7           3             40
```

In [32]:
```
fig=plt.gcf().set_size_inches(8, 8)
plt.hist(x=df_filter.Total, bins=10)
plt.title('Histogram of the total number of assistance', fontsize=20)
plt.xlabel('Number of assistances')
plt.ylabel('Frequency')
```

Out[32]:
```
<matplotlib.text.Text at 0x7f636d93edd0>
```



6 Criterion to create groups

This is taken under personal criterion based on the distribution of the data in the Histogram: 1. Group 1 (the faithful): People who came 8 or more times during the 6 months period. 2. Group 2 (the irregular): People who came between 3 and 7 times during the 6 months period. 3. Group 3 (the indecisive): People who came less or equal than 2 times during the 6 months period.

```
In [95]: group1cnt=df_filter['Total'][df_filter['Total']>=8].count()
         group2cnt=df_filter['Total'][(df_filter['Total']>=3) &
                                      (df_filter['Total']<=7)].count()
         group3cnt=df_filter['Total'][df_filter['Total']<=2].count()
```

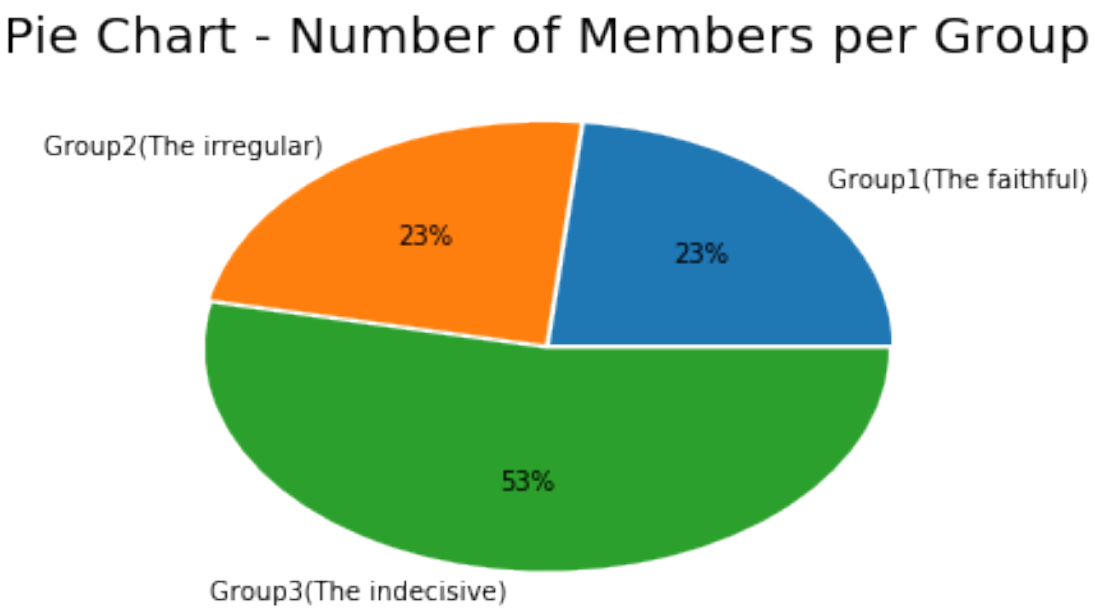
```
In [89]: groupsCount=DataFrame(OrderedDict([('Group1(the faithful)', group1cnt),
                                            ('Group2(the irregular)', group2cnt),
                                            ('Group3(the indecisive)', group3cnt)]),
                                            index=['Number of Members'])
```

```
In [65]: groupsCount
```

```
Out[65]:                    Group1(the faithful)  Group2(the irregular)  \
         Number of Members                    43                     43

                            Group3(the indecisive)
         Number of Members                      98
```

```
In [96]: x=groupsCount.loc['Number of Members']
         labels = ['Group1(The faithful)','Group2(The irregular)','Group3(The indecisive)']
         explode = (0.01, 0.01, 0.01)
         plt.pie(x, labels=labels, explode=explode, autopct='%.0f%%')
         plt.title('Pie Chart - Number of Members per Group', fontsize=20)
```

```
Out[96]: <matplotlib.text.Text at 0x7f636ced2750>
```



6.1 GROUP 1 - The faithful

```
In [51]: group1=df_filter[df_filter['Total']>=8]

In [55]: group1.head(5)
```

Out[55]:

	Nombre	Juli	August	September	Oktober	November	Dezember	Januar	Total
7	Ana Pascual	0	0	2	2	3	1	2	10
9	Anastasia M Butschek	0	0	2	5	5	2	0	14
16	Anne Burghartz	0	1	2	3	2	2	2	12
17	Anni Lopez	0	0	2	2	2	2	0	8
29	Carlos Ruiz	0	2	3	3	1	2	1	12

6.2 GROUP 2 - The irregular

```
In [56]: group2=df_filter[(df_filter['Total']>=3) & (df_filter['Total']<=7)]

In [58]: #print(group2.to_string())
         group2.head(5)
```

Out[58]:

	Nombre	Juli	August	September	Oktober	November	Dezember	Januar	Total
0	Alex Pimentel	1	0	2	0	0	0	0	3
2	Alexander Meier	0	4	0	0	0	0	0	4
3	Alina Wagner	1	0	2	0	0	0	0	3
10	Andres Acosta	0	1	2	1	0	0	0	4
12	Angelika Mucha	4	1	2	0	0	0	0	7

6.3 GROUP 3 - The indecisive

```
In [61]: group3=df_filter[df_filter['Total']<=2]

In [62]: group3.head(5)
```

Out[62]:

	Nombre	Juli	August	September	Oktober	November	Dezember	Januar	Total
1	Alex Weidner	1	0	0	1	0	0	0	2
4	Alonso Renard	0	0	0	1	0	0	0	1
5	Anais	0	0	0	0	0	0	1	1
6	Analie	0	0	0	0	1	0	0	1
8	Ana Perez	0	0	2	0	0	0	0	2