Investigate_a_Dataset-zh

April 19, 2018

1 :

1.1

##

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

##

1.1.1

```
In [2]: df=pd.read_csv('noshowappointments.csv')
```

```
In [3]: df.head(3)
```

```
Out[3]:       PatientId  AppointmentID Gender          ScheduledDay  \
        0  2.987250e+13        5642903      F  2016-04-29T18:38:08Z
        1  5.589978e+14        5642503      M  2016-04-29T16:08:27Z
        2  4.262962e+12        5642549      F  2016-04-29T16:19:04Z

                 AppointmentDay  Age    Neighbourhood  Scholarship  Hipertension  \
        0  2016-04-29T00:00:00Z   62  JARDIM DA PENHA            0             1
        1  2016-04-29T00:00:00Z   56  JARDIM DA PENHA            0             0
        2  2016-04-29T00:00:00Z   62    MATA DA PRAIA            0             0

           Diabetes  Alcoholism  Handcap  SMS_received No-show
        0         0           0        0             0      No
        1         0           0        0             0      No
        2         0           0        0             0      No
```

```
In [4]: df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 110527 entries, 0 to 110526
Data columns (total 14 columns):
PatientId         110527 non-null float64
AppointmentID     110527 non-null int64
Gender            110527 non-null object
ScheduledDay      110527 non-null object
AppointmentDay    110527 non-null object
Age               110527 non-null int64
Neighbourhood     110527 non-null object
Scholarship       110527 non-null int64
Hipertension      110527 non-null int64
Diabetes          110527 non-null int64
Alcoholism        110527 non-null int64
Handcap           110527 non-null int64
SMS_received      110527 non-null int64
No-show           110527 non-null object
dtypes: float64(1), int64(8), object(5)
memory usage: 11.8+ MB
```

~1.PatientId float64->int64 2.ScheduledDay object(String)->datetime 3.AppointmentDay object(String)->datetime

~No-show->no_show and each name of the columns should be lowercase

```
In [5]: np.sum(df.isnull())
```

```
Out[5]: PatientId         0
        AppointmentID     0
        Gender            0
        ScheduledDay      0
        AppointmentDay    0
        Age               0
        Neighbourhood     0
        Scholarship       0
        Hipertension      0
        Diabetes          0
        Alcoholism        0
        Handcap           0
        SMS_received      0
        No-show           0
        dtype: int64
```

~There is no missing value in the whole dataframe

```
In [6]: np.sum(df.duplicated())
```

```
Out[6]: 0
```

~There is no duplicated rows in the dataframe

1.1.2 /

1.PatientId float64->int64 2.ScheduledDay object(String)->datetime 3.AppointmentDay object(String)->datetime

```
In [7]: df['PatientId']=df['PatientId'].astype('int64')
        df['ScheduledDay']=pd.to_datetime(df['ScheduledDay'])
        df['AppointmentDay']=pd.to_datetime(df['AppointmentDay'])
```

```
In [8]: df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 110527 entries, 0 to 110526
Data columns (total 14 columns):
PatientId         110527 non-null int64
AppointmentID     110527 non-null int64
Gender            110527 non-null object
ScheduledDay      110527 non-null datetime64[ns]
AppointmentDay    110527 non-null datetime64[ns]
Age               110527 non-null int64
Neighbourhood     110527 non-null object
Scholarship       110527 non-null int64
Hipertension      110527 non-null int64
Diabetes          110527 non-null int64
Alcoholism        110527 non-null int64
Handcap           110527 non-null int64
SMS_received      110527 non-null int64
No-show           110527 non-null object
dtypes: datetime64[ns](2), int64(9), object(3)
memory usage: 11.8+ MB
```

~1.PatientId float64->int64 2.ScheduledDay object(String)->datetime 3.AppointmentDay object(String)->datetime (DONE)

No-show->no_show and each name of the columns should be lowercase

```
In [9]: df.rename(columns=lambda x:x.lower(),inplace=True)
```

```
In [10]: df.rename(columns={'no-show':'no_show'},inplace=True)
```

```
In [11]: df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 110527 entries, 0 to 110526
Data columns (total 14 columns):
patientid         110527 non-null int64
appointmentid     110527 non-null int64
gender            110527 non-null object
scheduledday      110527 non-null datetime64[ns]
```

```
appointmentday    110527 non-null datetime64[ns]
age               110527 non-null int64
neighbourhood     110527 non-null object
scholarship       110527 non-null int64
hipertension      110527 non-null int64
diabetes          110527 non-null int64
alcoholism        110527 non-null int64
handcap           110527 non-null int64
sms_received      110527 non-null int64
no_show           110527 non-null object
dtypes: datetime64[ns](2), int64(9), object(3)
memory usage: 11.8+ MB
```

```
In [12]: df.head(1)
```

```
Out[12]:         patientid  appointmentid gender        scheduledday appointmentday  \
         0  29872499824296        5642903      F 2016-04-29 18:38:08     2016-04-29

            age    neighbourhood  scholarship  hipertension  diabetes  alcoholism  \
         0   62  JARDIM DA PENHA            0             1         0           0

            handcap  sms_received no_show
         0        0             0      No
```

No-show->no_show and each name of the columns should be lowercaseDONE)

```
In [13]: df_copy=df.copy()
```

create a photocopy for futher exploratory research
##

1.1.3 1

```
In [14]: df.head(1)
```

```
Out[14]:         patientid  appointmentid gender        scheduledday appointmentday  \
         0  29872499824296        5642903      F 2016-04-29 18:38:08     2016-04-29

            age    neighbourhood  scholarship  hipertension  diabetes  alcoholism  \
         0   62  JARDIM DA PENHA            0             1         0           0

            handcap  sms_received no_show
         0        0             0      No
```

patientid,appointmentid,scheduledday,appointmentday seem to have nearly little effect on no_show decision.So for exploratory discussion,I drop them.

```
In [15]: df.drop(['patientid','appointmentid','scheduledday','appointmentday'],axis=1,inplace=Tr
In [16]: df.describe()
```

```
Out[16]:                  age    scholarship   hipertension       diabetes  \
         count  110527.000000  110527.000000  110527.000000  110527.000000
         mean       37.088874       0.098266       0.197246       0.071865
         std        23.110205       0.297675       0.397921       0.258265
         min        -1.000000       0.000000       0.000000       0.000000
         25%        18.000000       0.000000       0.000000       0.000000
         50%        37.000000       0.000000       0.000000       0.000000
         75%        55.000000       0.000000       0.000000       0.000000
         max       115.000000       1.000000       1.000000       1.000000

                  alcoholism        handcap   sms_received
         count  110527.000000  110527.000000  110527.000000
         mean        0.030400       0.022248       0.321026
         std         0.171686       0.161543       0.466873
         min         0.000000       0.000000       0.000000
         25%         0.000000       0.000000       0.000000
         50%         0.000000       0.000000       0.000000
         75%         0.000000       0.000000       1.000000
         max         1.000000       4.000000       1.000000
```

```
In [17]: df.loc[df['no_show']=='No','no_show']=0
```

```
In [18]: df.loc[df['no_show']=='Yes','no_show']=1
```

```
In [19]: df['no_show']=df['no_show'].astype('int')
```

use 0 to represent No and 1 to represent Yes

```
In [20]: df.head(1)
```

```
Out[20]:   gender  age    neighbourhood  scholarship  hipertension  diabetes  \
         0      F   62  JARDIM DA PENHA            0             1         0

            alcoholism  handcap  sms_received  no_show
         0           0        0             0        0
```

```
In [21]: df['no_show'].value_counts()/np.sum(df['no_show'].value_counts())
```

```
Out[21]: 0    0.798067
         1    0.201933
         Name: no_show, dtype: float64
```

neighbourhood->no_show ?

```
In [22]: s=df.groupby('neighbourhood').mean()['no_show']
```

```
In [23]: s[s==s.max()]
```

```
Out[23]: neighbourhood
         ILHAS OCEÂNICAS DE TRINDADE    1.0
         Name: no_show, dtype: float64
```

```
In [24]: df.loc[df['neighbourhood']=='ILHAS OCEÂNICAS DE TRINDADE']
```

```
Out[24]:       gender  age                neighbourhood  scholarship  hipertension  \
         48754      F   51  ILHAS OCEÂNICAS DE TRINDADE            0             0
         48765      F   58  ILHAS OCEÂNICAS DE TRINDADE            0             0

                diabetes  alcoholism  handcap  sms_received  no_show
         48754         0           0        0             0        1
         48765         0           0        0             0        1
```

The amount of this sample is too small that it can not illustrate that some neighbourhood leads to more patients to attend.

```
In [25]: np.sum(df.groupby('neighbourhood').mean()['no_show']>=0.25)
```

```
Out[25]: 5
```

```
In [26]: s[df.groupby('neighbourhood').mean()['no_show']>=0.25]
```

```
Out[26]: neighbourhood
         ILHAS OCEÂNICAS DE TRINDADE    1.000000
         ITARARÉ                        0.262664
         SANTA CECÍLIA                  0.274554
         SANTA CLARA                    0.264822
         SANTOS DUMONT                  0.289185
         Name: no_show, dtype: float64
```

Guess:these five neighborhoods(hospital location)may provide better aid

```
In [27]: np.sum((df.groupby('neighbourhood').mean()['no_show']>=0) &(df.groupby('neighbourhood')
```

```
Out[27]: 2
```

```
In [28]: s[(df.groupby('neighbourhood').mean()['no_show']>=0) &(df.groupby('neighbourhood').mean
```

```
Out[28]: neighbourhood
         ILHA DO BOI          0.085714
         PARQUE INDUSTRIAL    0.000000
         Name: no_show, dtype: float64
```

```
In [29]: len(df[df['neighbourhood']=='ILHA DO BOI'])
```

```
Out[29]: 35
```

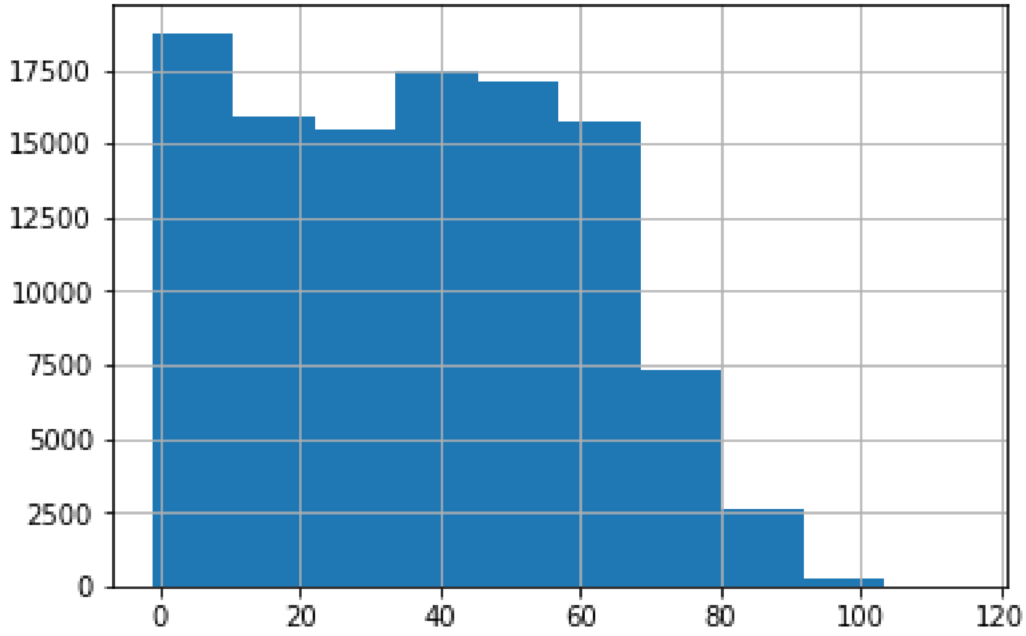
’no_show<0.1’may indicates that the hospital is not welcomed or the mount of sample is small. neighbourhood:ILHA DO BOI is not welcomed while SANTA CECÍLIA,SANTA CLARA,SANTOS DUMONT etc.. are welcomed

There are only 5 neighbourhoods(hospital location) which have more than 1/4 patients to attend their appointments.The sample is too small and the mean of no_show is almost ranging from 0.1 to 0.3.So neighbourhood plays a nonsignificant role in no_show decision.

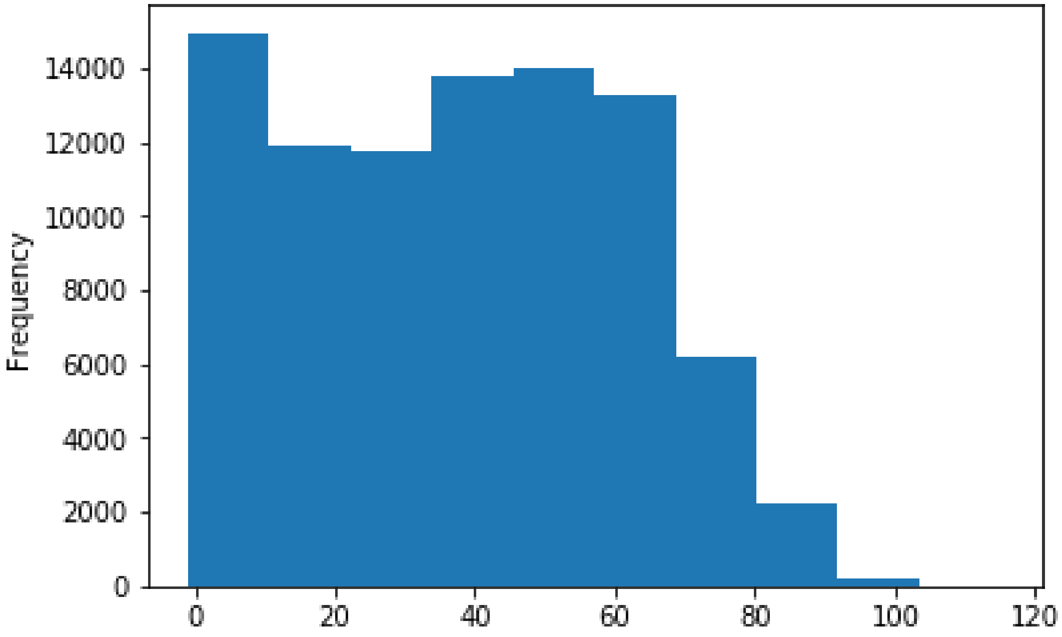
```
In [30]: df=df.drop('neighbourhood',axis=1)
```

AGE

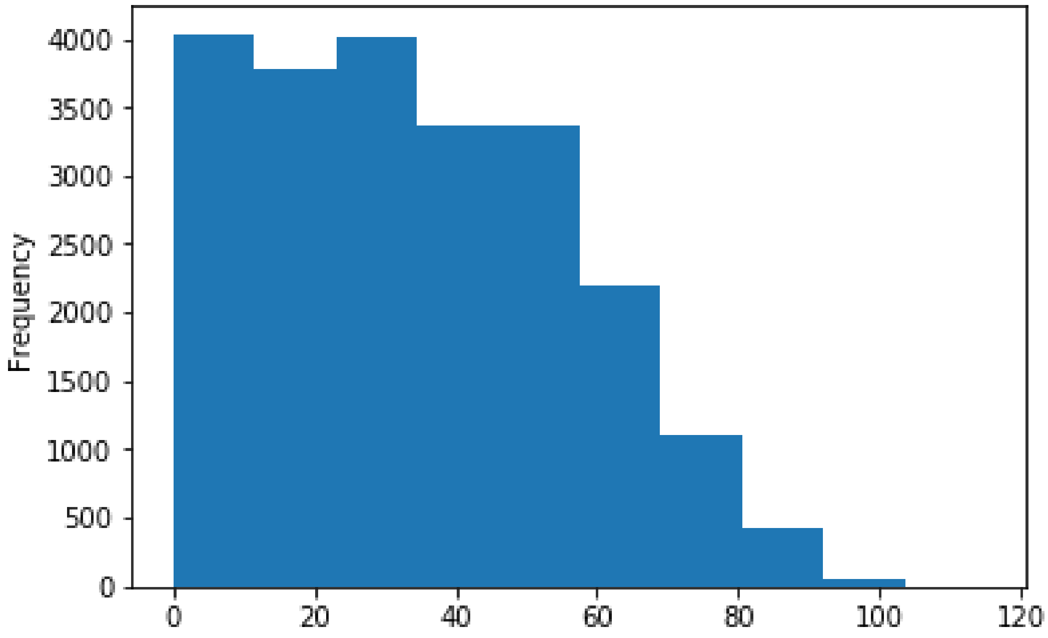
```
In [31]: df['age'].hist()

Out[31]: <matplotlib.axes._subplots.AxesSubplot at 0x7f8e4da5ccf8>
```



```
In [32]: df0=df.loc[df['no_show']==0]
         df1=df.loc[df['no_show']==1]

In [33]: df0['age'].plot(kind='hist')

Out[33]: <matplotlib.axes._subplots.AxesSubplot at 0x7f8e4d5a59b0>
```



```
In [34]: df1['age'].plot(kind='hist')

Out[34]: <matplotlib.axes._subplots.AxesSubplot at 0x7f8e4d45a0f0>
```

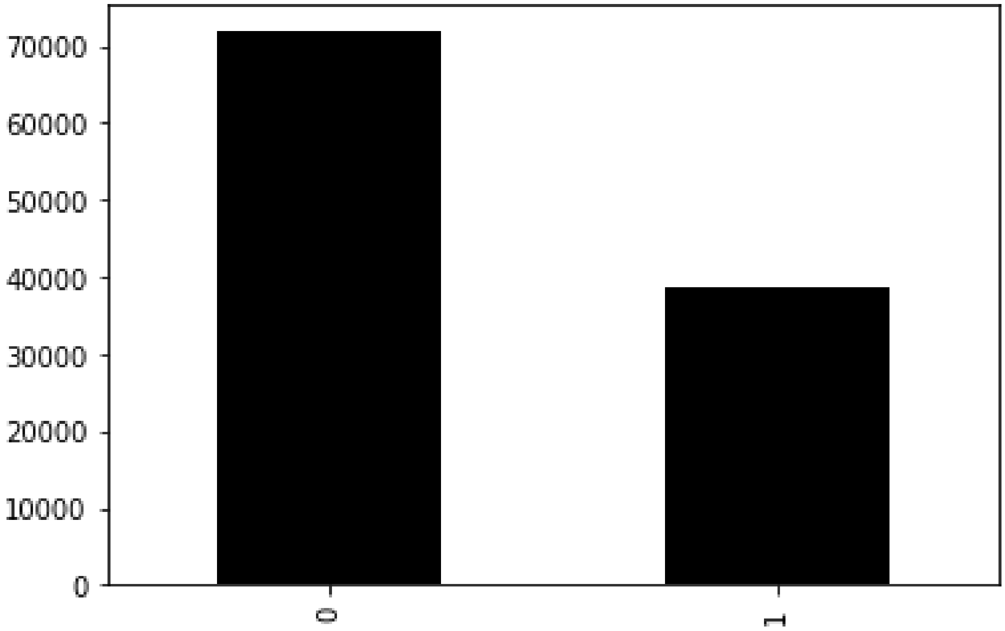


df0 indicates “no” appointments and df1 indicates “yes” appointments.As you can see,these is almost no difference between df0,df1 and df descendant age between 60-70 from df1 and df2 and ascendant from 10-30 may illustrate some.I’ll talk about age later by using ‘cut’ function.

```
In [35]: df.drop('age',axis=1,inplace=True)

In [36]: df.head(1)

Out[36]:   gender  scholarship  hipertension  diabetes  alcoholism  handcap  \
       0      F            0             1         0           0        0

          sms_received  no_show
       0             0        0
```

Famale:0 Male:1 convert gender(F,M) to 1,0

```
In [37]: df.loc[df['gender']=='F','gender']=0
         df.loc[df['gender']=='M','gender']=1

In [41]: df['gender'].value_counts().plot(kind='bar',color='black')

Out[41]: <matplotlib.axes._subplots.AxesSubplot at 0x7f8e4d35f630>
```



```
In [42]: df.groupby(['gender','no_show']).describe().iloc[:,0]/df.groupby('gender').count().iloc
```

```
Out[42]: gender  no_show
         0       0          0.796854
                 1          0.203146
         1       0          0.800321
                 1          0.199679
         dtype: float64
```

Gender has little correlation with no_show attribute.

```
In [43]: df.drop('gender',axis=1,inplace=True)
```

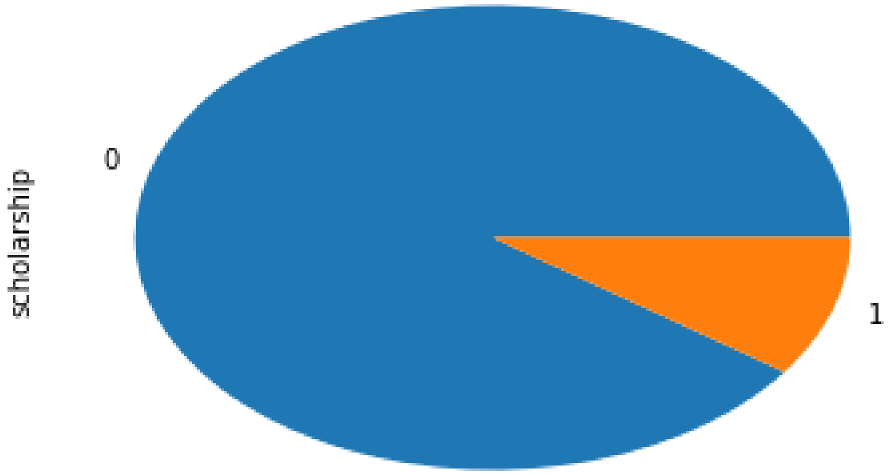
scholarship guess:1 tend to see the doc and 0 not

```
In [44]: df['scholarship'].value_counts()
```

```
Out[44]: 0    99666
         1    10861
         Name: scholarship, dtype: int64
```

```
In [45]: df['scholarship'].value_counts().plot(kind='pie')
```

```
Out[45]: <matplotlib.axes._subplots.AxesSubplot at 0x7f8e4ce90588>
```



```
In [46]: df.groupby('scholarship').mean()
```

```
Out[46]:              hipertension  diabetes  alcoholism   handcap  sms_received  \
         scholarship
         0                0.199837  0.073987    0.028415  0.022706      0.320842
```

```
1                0.173465  0.052389    0.048614  0.018046      0.322714

              no_show
scholarship
0            0.198072
1            0.237363
```

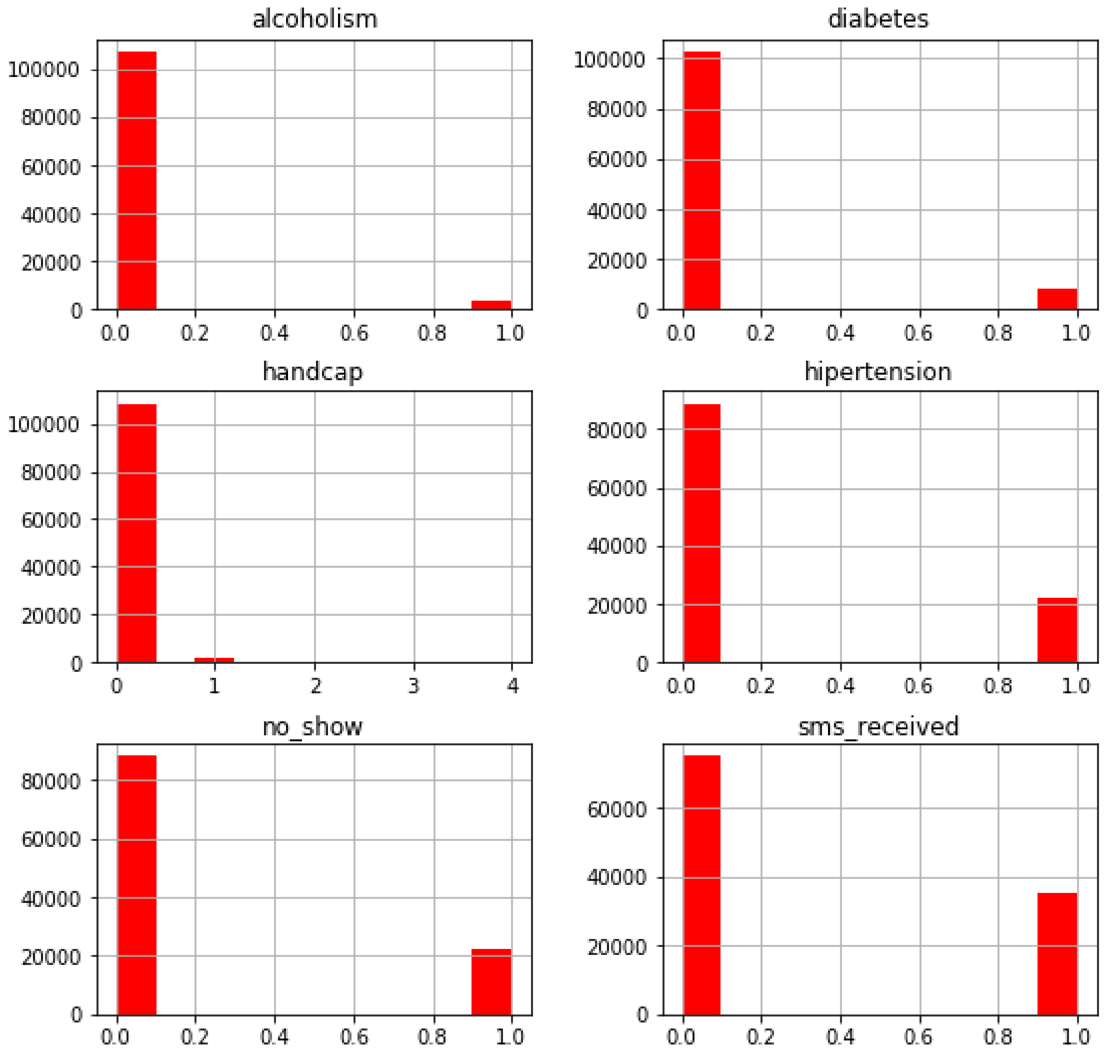
Surely,when the scholarship value=1,individual tends to see the doctor than 0

```
In [47]: df.drop('scholarship',axis=1,inplace=True)
         df.head(1)
```

```
Out[47]:    hipertension  diabetes  alcoholism  handcap  sms_received  no_show
         0             1         0           0        0             0        0
```

```
In [48]: df.hist(figsize=(9,9),color='r')
```

```
Out[48]: array([[<matplotlib.axes._subplots.AxesSubplot object at 0x7f8e4cd39f98>,
                 <matplotlib.axes._subplots.AxesSubplot object at 0x7f8e4ccf9048>],
                [<matplotlib.axes._subplots.AxesSubplot object at 0x7f8e4a31fb38>,
                 <matplotlib.axes._subplots.AxesSubplot object at 0x7f8e4a2dc7b8>],
                [<matplotlib.axes._subplots.AxesSubplot object at 0x7f8e4a2984a8>,
                 <matplotlib.axes._subplots.AxesSubplot object at 0x7f8e4d2f59b0>]], dtype=objec
```



hipertension,diabetes,alcoholism and handcap indicate that most of people are healthy so that people tend not to see doctor. hipertension,diabetes,alcoholism and are three differents disease.I add them up as one attribute:disease

```
In [53]: df['disease']=df['hipertension']+df['diabetes']+df['alcoholism']
```

```
In [54]: df['disease'].value_counts()
```

```
Out[54]: 0    85312
         1    17582
         2     7377
         3      256
         Name: disease, dtype: int64
```

I take the sample of 0 disease and 3 diseases for learning

```
In [55]: df_0=df[df['disease']==0]
         df_3=df[df['disease']==3]
```

```
In [56]: df['no_show'].value_counts()/np.sum(df['no_show'].value_counts())
```

```
Out[56]: 0    0.798067
         1    0.201933
         Name: no_show, dtype: float64
```

The whole proportion of this dataframe on no_show

```
In [57]: df_0['no_show'].value_counts()/np.sum(df.loc[df['disease']==0,'no_show'].value_counts()
```

```
Out[57]: 0    0.790909
         1    0.209091
         Name: no_show, dtype: float64
```

The proportion on no_show when the sum of disease is 0

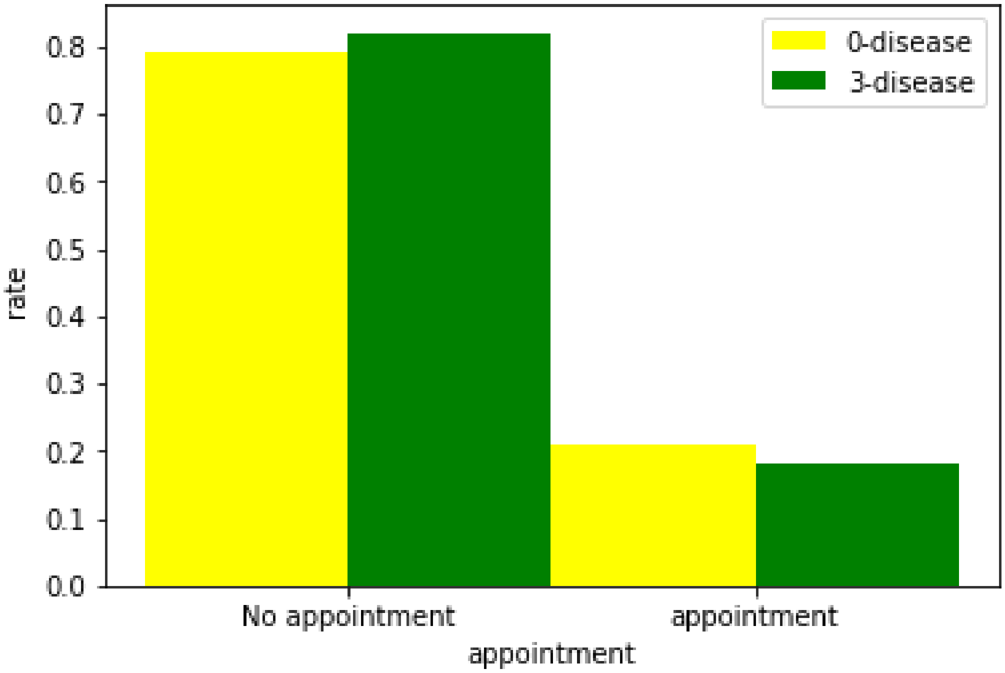
```
In [58]: df_3['no_show'].value_counts()/np.sum(df.loc[df['disease']==3,'no_show'].value_counts()
```

```
Out[58]: 0    0.820312
         1    0.179688
         Name: no_show, dtype: float64
```

```
In [59]: df_p_0=df_0['no_show'].value_counts()/np.sum(df.loc[df['disease']==0,'no_show'].value_c
         df_p_3=df_3['no_show'].value_counts()/np.sum(df.loc[df['disease']==3,'no_show'].value_c
```

```
In [60]: ind = np.arange(2)
         width = 0.5
         plt.bar(ind,df_p_0.values,width,color = 'yellow',label = '0-disease')
         plt.bar(ind+width,df_p_3.values,width,color = 'g',label = '3-disease') # ind+width adju
         plt.xticks(np.arange(2) + width/2, ('No appointment','appointment'))
         plt.legend()
         plt.xlabel('appointment')
         plt.ylabel(' rate')
```

```
Out[60]: Text(0,0.5,' rate')
```



The proportion on no_show when the sum of disease is 3

AS you can see,the amount of people tending to see the doctor increases when the sum of diseases decreases,strange

```
In [61]: df.drop(['hipertension','diabetes','alcoholism'],axis=1,inplace=True)
```

```
In [62]: df.drop('disease',axis=1,inplace=True)
```

```
In [66]: df.corr()
```

```
Out[66]:                handcap  sms_received   no_show
         handcap       1.000000     -0.024161 -0.006076
         sms_received -0.024161      1.000000  0.126431
         no_show      -0.006076      0.126431  1.000000
```

no significant correaltion

HandCAP

```
In [67]: df['handcap'].value_counts()
```

```
Out[67]: 0    108286
         1      2042
         2       183
         3        13
         4         3
         Name: handcap, dtype: int64
```

```
In [68]: df.groupby('handcap').mean()['no_show']
```

```
Out[68]: handcap
         0    0.202353
         1    0.179236
         2    0.202186
         3    0.230769
         4    0.333333
         Name: no_show, dtype: float64
```

As you can see from statistical data,bigger handcap standard(more serious)leads to higher posibility on seeing a doctoc.Some people who are not handcapped tend to be more careful about their health.

```
In [69]: df.drop('handcap',axis=1,inplace=True)
```

sms_received message receive

```
In [70]: df['sms_received'].value_counts()
```

```
Out[70]: 0    75045
         1    35482
         Name: sms_received, dtype: int64
```

```
In [71]: df['no_show_st']=df['no_show']
```

```
In [72]: (df.groupby(['sms_received','no_show']).count()/df.groupby(['sms_received']).count()).l
```

```
Out[72]: sms_received  no_show
         0             0          0.832967
                       1          0.167033
         1             0          0.724255
                       1          0.275745
         Name: no_show_st, dtype: float64
```

It can inferred that someone who received message would have bigger posibility to see the doctor.

From what has been discussed above,I can indicate that there are at least six attributes contributing the choice to see the doc or not 1.sms_received 2.handcap 3.sum of diseases 4.scholarship 5.age has slight effect on no_show 6.neighboorhood

1.1.4 2

```
In [73]: #use photocopy
         df=df_copy
```

```
In [74]: df.head(1)
```

```
Out[74]:         patientid  appointmentid gender        scheduledday appointmentday  \
         0  29872499824296        5642903      F 2016-04-29 18:38:08     2016-04-29

            age    neighbourhood  scholarship  hipertension  diabetes  alcoholism  \
         0   62  JARDIM DA PENHA            0             1         0           0

            handcap  sms_received no_show
         0        0             0      No
```

```
In [75]: df.drop(['patientid','appointmentid','scheduledday','appointmentday','neighbourhood','s
```

```
In [76]: df.head(1)
```

```
Out[76]:   gender  age  hipertension  diabetes  alcoholism  handcap
         0      F   62             1         0           0        0
```

```
In [77]: df.loc[df['gender']=='F','gender']=0
         df.loc[df['gender']=='M','gender']=1
```

```
In [78]: df['gender']=df['gender'].astype('int64')
```

```
In [79]: df.describe()
```

```
Out[79]:               gender            age   hipertension       diabetes  \
         count  110527.000000  110527.000000  110527.000000  110527.000000
         mean        0.350023      37.088874       0.197246       0.071865
         std         0.476979      23.110205       0.397921       0.258265
         min         0.000000      -1.000000       0.000000       0.000000
         25%         0.000000      18.000000       0.000000       0.000000
         50%         0.000000      37.000000       0.000000       0.000000
         75%         1.000000      55.000000       0.000000       0.000000
         max         1.000000     115.000000       1.000000       1.000000

                   alcoholism        handcap
         count  110527.000000  110527.000000
         mean        0.030400       0.022248
         std         0.171686       0.161543
         min         0.000000       0.000000
         25%         0.000000       0.000000
         50%         0.000000       0.000000
         75%         0.000000       0.000000
         max         1.000000       4.000000
```

```
In [80]: df.corr()
```

```
Out[80]:                 gender       age  hipertension  diabetes  alcoholism   handcap
         gender        1.000000 -0.106440     -0.055718 -0.032554    0.106167  0.022814
         age          -0.106440  1.000000      0.504586  0.292391    0.095811  0.078033
         hipertension -0.055718  0.504586      1.000000  0.433086    0.087971  0.080083
         diabetes     -0.032554  0.292391      0.433086  1.000000    0.018474  0.057530
         alcoholism    0.106167  0.095811      0.087971  0.018474    1.000000  0.004648
         handcap       0.022814  0.078033      0.080083  0.057530    0.004648  1.000000
```

```
In [81]: df['age_new']=pd.qcut(df['age'],7,labels=[1,2,3,4,5,6,7]) #3,5,7,9 try
```

```
In [82]: df['age_new']=df['age_new'].astype('int64')
```

```
In [83]: df.corr()
```

```
Out[83]:                gender       age  hipertension  diabetes  alcoholism  \
         gender        1.000000 -0.106440     -0.055718 -0.032554    0.106167
         age          -0.106440  1.000000      0.504586  0.292391    0.095811
         hipertension -0.055718  0.504586      1.000000  0.433086    0.087971
         diabetes     -0.032554  0.292391      0.433086  1.000000    0.018474
         alcoholism    0.106167  0.095811      0.087971  0.018474    1.000000
         handcap       0.022814  0.078033      0.080083  0.057530    0.004648
         age_new      -0.103286  0.983825      0.500696  0.293484    0.102996

                        handcap   age_new
         gender        0.022814 -0.103286
         age           0.078033  0.983825
         hipertension  0.080083  0.500696
         diabetes      0.057530  0.293484
         alcoholism    0.004648  0.102996
         handcap       1.000000  0.070179
         age_new       0.070179  1.000000
```

Age has relatively strong correlation with hipertension and diabetes than the other diseases and it does not work when you cut 'age' into 3,5,7 or 9 pieces

hipertension has a relatively strong correlation with diabetes than the others,that is,hipertension may lead to diabetes.

```
In [84]: df['disease']=df['hipertension']+df['diabetes']
```

```
In [85]: df.drop(['hipertension','diabetes'],axis=1,inplace=True)
```

```
In [86]: df.drop(['age'],axis=1,inplace=True)
```

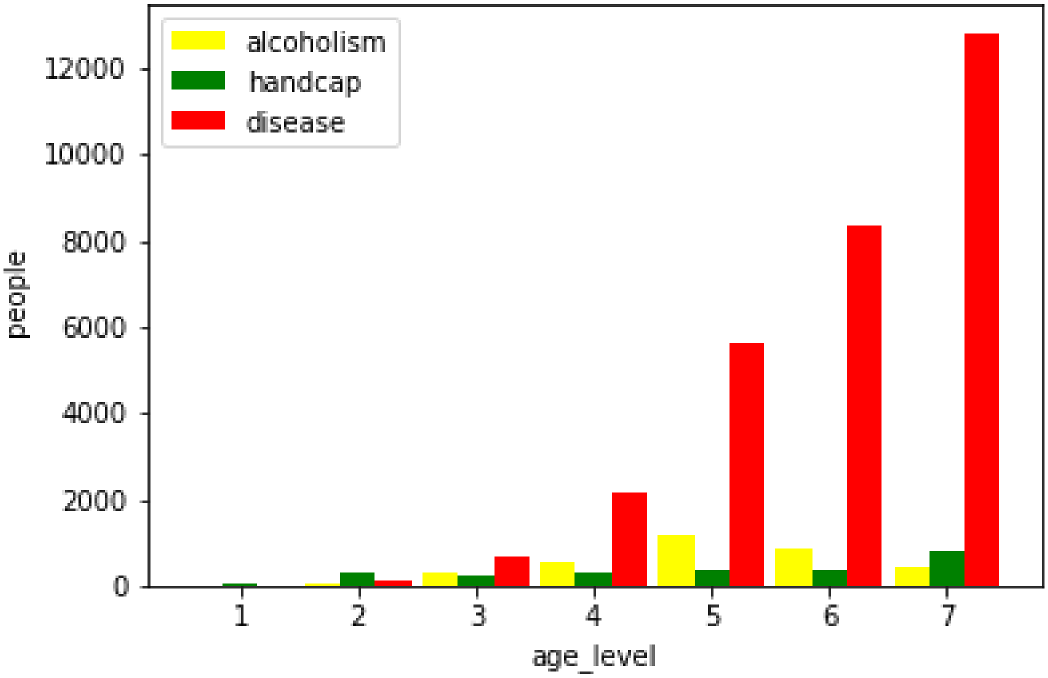
```
In [87]: df.head(1)
```

```
Out[87]:    gender  alcoholism  handcap  age_new  disease
         0       0           0        0        6        1
```

```
In [88]: df_=df.groupby('age_new').sum()
```

```
In [89]: ind = np.arange(7)
         width = 0.3
         plt.bar(ind,df_['alcoholism'].values,width,color = 'yellow',label = 'alcoholism')
         plt.bar(ind+width,df_['handcap'].values,width,color = 'g',label = 'handcap')
         plt.bar(ind+2*width,df_['disease'].values,width,color = 'r',label = 'disease')# ind+wid
         plt.xticks(np.arange(7) + width, ('1','2','3','4','5','6','7'))
         plt.legend()
         plt.xlabel('age_level')
         plt.ylabel(' people')
```

```
Out[89]: Text(0,0.5,' people')
```



Unlike alcoholism and handcap,disease grows fast when people get old

```
In [90]: df.groupby('gender').mean()
```

```
Out[90]:         alcoholism   handcap   age_new   disease
         gender
         0         0.017024  0.019543  4.123385  0.291551
         1         0.055238  0.027270  3.690439  0.227441
```

Famale tends to get more diseases than male but male has bigger probability to be addicted to alcoholism

```
In [91]: df.groupby('alcoholism').mean()
```

```
Out[91]:               gender   handcap   age_new   disease
         alcoholism
         0           0.341056  0.022115  3.935381  0.262068
         1           0.636012  0.026488  5.134821  0.493750
```

elder people tend tp be addicted to alcoholism than young people and alcoholism may lead to more diseases and also, male has bigger probability to be addicted to alcoholism than female.

```
In [92]: df.groupby('handcap').mean()
```

```
Out[92]:           gender  alcoholism   age_new   disease
         handcap
         0       0.348485    0.030309  3.949947  0.262056
         1       0.421645    0.034280  5.069050  0.606758
         2       0.426230    0.027322  4.633880  0.693989
         3       0.769231    0.230769  5.153846  0.076923
         4       0.666667    0.000000  2.000000  0.000000
```

no obvious finding about handcap

```
In [115]: (df.groupby(['gender','disease']).sum()/df.groupby('gender').count()).loc[:,'alcoholis
```

```
Out[115]: gender  disease
          0       0          0.010175
                  1          0.005554
                  2          0.001295
          1       0          0.031690
                  1          0.019335
                  2          0.004213
          Name: alcoholism, dtype: float64
```

As you can see,I can infer from this statistical data that female with healthy body tend to care about a healthier livestyle (no alcohol)than male.

Indication:All the conclusion is contemporary and not concrete because of the small amount of dataset and no significantly strong corraltion between no_show and the other attributes or within all the attributes.SO,I can just find some regular patterns within this dataset and all the conclusion is based on inferrence.

```
1.From what has been discussed above in the first question,I can indicate that there are at leas
1.sms_received 2.handcap 3.the sum of diseases 4.scholarship 5.age has slight effect on no_show

Detailed information:
1.sms_received(0/1) when people received message,they tended to see the doctor.
2.handcap:bigger handcap standard(more serious)leads to higher posibility on seeing a doctoc
3.the sum of diseases:people tend not to see the doctor when they got more diseases.strange.
4.scholarship:people who received scholarship from government tend to see the doctor.
5.age:slight effect on decision.not obvious.
6.neighborhood(hospital location)contribute to the decision.


2.From question 2:
1.Age has relatively strong correlation with hipertension and diabetes than the other diseases a
2.hipertension has a relatively strong correlation with diabetes than the others,that is,hiperte
3.Unlike alcoholism and handcap,disease grows fast when people get old
4.Famale tends to get more diseases than male but male has bigger probability to be addicted to
5.elder people tend to be addicted to alcoholism than young people and alcoholism may lead to mo
6.female with healthy body tend to care about a healthier livestyle (no alcohol)than male
```