```
import numpy  as np
import pandas as pd
import math

import matplotlib.pyplot as plt


# Read data from gdrive first
from google.colab import drive
drive.mount('/content/drive')
```

```
     Mounted at /content/drive
```

```
# Task 1
data = pd.read_csv( '/content/drive/My Drive/data/data.csv', delimiter=',' )


# Task 2
print( data.describe() )
```

```
                    Id  ...  NumberOfDependents
     count  1350.000000  ...         1307.000000
     mean    675.500000  ...            0.737567
     std     389.855743  ...            1.086949
     min       1.000000  ...            0.000000
     25%     338.250000  ...            0.000000
     50%     675.500000  ...            0.000000
     75%    1012.750000  ...            1.000000
     max    1350.000000  ...            8.000000

     [8 rows x 12 columns]
```

```
# Task 3
print( data.head() )
```

```
        Id  ...  NumberOfDependents
     0   1  ...                 2.0
     1   2  ...                 1.0
     2   3  ...                 0.0
     3   4  ...                 0.0
     4   5  ...                 0.0

     [5 rows x 12 columns]
```

```
print( data.tail() )
```

```
             Id  ...  NumberOfDependents
     1345  1346  ...                 0.0
     1346  1347  ...                 1.0
     1347  1348  ...                 1.0
     1348  1349  ...                 2.0
     1349  1350  ...                 0.0

     [5 rows x 12 columns]
```

```
# Task 6
data.rename( columns = { 'DebtRatio' : 'Debt' }, inplace = True )


# Task 5
data.loc[data['MonthlyIncome'].notnull(), "Debt"] = data.loc[data['MonthlyIncome'].notnull
print(data[["Debt", "Id"]])
```

```
                Debt    Id
     0     7323.197016     1
     1      316.878123     2
     2      258.914887     3
     3      118.963951     4
     4     1584.975094     5
     ...           ...   ...
     1345   232.944085  1346
     1346  1200.699824  1347
     1347  3230.676930  1348
     1348  2407.712069  1349
     1349  1463.000000  1350

     [1350 rows x 2 columns]
```

```
# Task 7
mean = data.loc[data['MonthlyIncome'].notnull(), "MonthlyIncome"].mean()
data.loc[data['MonthlyIncome'].isnull(), "MonthlyIncome"] = mean


# Task 8
print(data['SeriousDlqin2yrs'].groupby(data['NumberOfDependents']).mean())
print('--------------------------------')
print(data['SeriousDlqin2yrs'].groupby(data['NumberRealEstateLoansOrLines']).mean())
```

```
     NumberOfDependents
     0.0    0.041397
     1.0    0.089844
     2.0    0.110465
     3.0    0.057143
     4.0    0.033333
     5.0    0.000000
     6.0    0.000000
     8.0    0.000000
     Name: SeriousDlqin2yrs, dtype: float64
     --------------------------------
     NumberRealEstateLoansOrLines
     0    0.056863
     1    0.048729
     2    0.063158
     3    0.145455
     4    0.105263
     5    0.000000
     6    1.000000
     8    0.000000
     Name: SeriousDlqin2yrs, dtype: float64
```

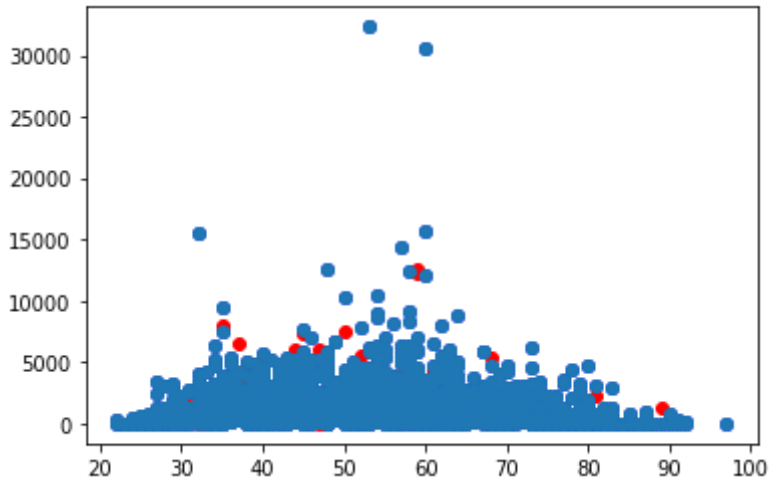
```
fig, ax = plt.subplots()

zeroDebts = data.loc[data["SeriousDlqin2yrs"] == 0]
```

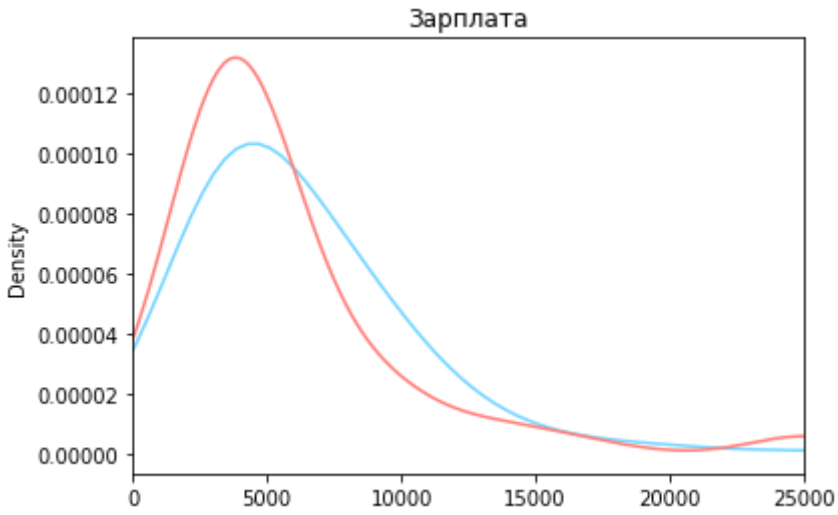
```
zeroDebts = zeroDebts.loc[zeroDebts["MonthlyIncome"] != mean]

moreThanZeroDebts = data.loc[data["SeriousDlqin2yrs"] > 0]
moreThanZeroDebts = moreThanZeroDebts.loc[moreThanZeroDebts["MonthlyIncome"] != mean]

ax.scatter(zeroDebts['age'], zeroDebts["Debt"], c="blue")
ax.scatter(moreThanZeroDebts['age'], moreThanZeroDebts["Debt"], c="red")
plt.scatter(zeroDebts['age'], zeroDebts['Debt'])
plt.show()
```




```
fig, ax = plt.subplots()
plt.xlim([0, 25000])
plt.title('Зарплата')
zeroDebts['MonthlyIncome'].plot.kde(ax=ax, label="Без серьезных задолжностей", color="#76D
moreThanZeroDebts['MonthlyIncome'].plot.kde(ax=ax, label="С серьезными задолжностями", col
plt.show()
```




```
incomeNoMoreThan25K = data.loc[data["MonthlyIncome"] <= 25000]
incomeNoMoreThan25K = data.loc[data["MonthlyIncome"] != mean]


plt.title("Возраст и зарплата")

plt.xlim([16, 100])
plt.ylim([0, 25000])
```

```
plt.ylim([0, 25000])
plt.plot(incomeNoMoreThan25K['age'],incomeNoMoreThan25K['MonthlyIncome'], 'o')
plt.show()
```


```
plt.title("Возраст и число детей")

plt.xlim([16, 100])
plt.ylim([0, 20])
yint = range(int(incomeNoMoreThan25K['NumberOfDependents'].min()), int(incomeNoMoreThan25K
plt.yticks(yint)
plt.plot(incomeNoMoreThan25K['age'],incomeNoMoreThan25K['NumberOfDependents'], 'o')
plt.show()
```


```
plt.title("Взаимосвязь зарплат и числа детей")

plt.xlim([0, 25000])
plt.ylim([0, 20])
yint = range(int(incomeNoMoreThan25K['NumberOfDependents'].min()), int(incomeNoMoreThan25K
plt.yticks(yint)
plt.plot(incomeNoMoreThan25K['MonthlyIncome'],incomeNoMoreThan25K['NumberOfDependents'], '
plt.show()
```


Взаимосвязь зарплаты и числа иждивенцев
0
5000
10000
15000
20000
25000