1. How do you ensure that customers can/will pay their loans?
   There's not algorithm that can predict if a customer will pay or not their loans, but it's possible to estimate the probability of a group with similar behavior (age, education, gender, marital status, amount of the given credit) to default or not.

2. Can we approve customers with high certainty?
   You can approve the customers with higher level of education meaning university or graduate school and with a high score rate. The higher the score the lower the risk.

3. Which attributes in the data can we deem to be statistically significant to the problem at hand?
   Education: The most educated people tend to pay their loans.
   History of past payment: Pay past credit accounts on time could increase your chances of getting credit and late payments can hurt your payment history by pushing your credit scores down and making you look like a higher-risk borrower.

4. What concrete information can we derive from the data we have?

   ▪ The age, gender and marital status are not determinant factors to get in default. For those categories around 20%-25% of the population are in default and from 70-75% are not.

| Age	# Loans	Default	No Default	% Default	% No Default
20's	9,618	2,197	7,421	22,84	77,16
30's	11,238	2,276	8,962	20,25	79,75
40's	6,464	1,586	4,878	24,54	75,46
50's	2,341	582	1,59	24,86	75,14
60's	314	89	225	28,34	71,66
70's	25	7	18	28,00	72,00
Marital Status	# Loans	Default	No Default	% Default	% No Default
Single	15,964	3,341	12,623	20,93	79,07
Married	13,659	3,206	10,453	23,47	76,53
Divorce	323	84	239	26,01	73,99
Others	54	5	49	9,26	90,74
Gender	# Loans	Default	No Default	% Default	% No Default
Male	11,888	2,873	9,015	24,17	75,83
Female	18,112	3,763	14,349	20,78	79,22

   ▪ Most of the loans are requested by the highest level of scholarity and is the segment that pays the more.
   ▪ Almost 70% of high school population are in default.

Education	# Loans	Default	No Default	% Default	% No Default
Graduate School	10,585	2,036	8,549	19,23	80,77
University	14,030	1,237	12,793	8,82	91,18
High School	4,917	3,330	1,587	67,72	32,28
Others	468	33	435	7,05	92,95

Insights

- Credit scores offers snapshot of the customers debt repayment history at a single point in time, letting to know what type of risk will be taken to lend them money.
- The higher the credit score, the more confident CreditOne can be of the customer's creditworthiness.
- The lower level of education, the higher risk to default.
- History of past payment reveals what customers are more likely to pay and what are the ones to default.
- Customer that get delay on their payment since the first month are likely to continue like that from next monthly payment.

Visualizations
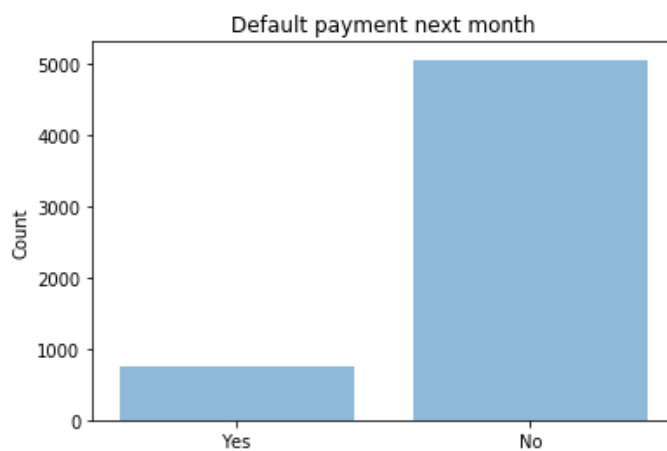

```
===== Accuracy ======
0.8067067927773001
===== Confusion Matrix =====
 [[4243  299]
 [ 825  448]]
```

Taking a sample of 20% of the data, meaning from 5,815 customers: 5,068 (87%) will pay and 747 (13%) will default.

Individuals with low incomes, or those that did not regularly pay down credit card balances, might be deemed less creditworthy, whereas those with higher incomes and strong track records of repayment might be deemed more creditworthy.

Recommendations

Besides the information analyze before, is strongly recommended to start collecting next data to create a more robust credit score calculation and be more accurate to predict the default:

Ability to repay: Borrower's total current income and existing debt, to make sure that the existing debt plus the potential loan debt and related expenses do not exceed a stated percentage of the borrower's income.

Credit history: It is a roadmap of a consumer's ability to handle borrowing money and demonstrate responsibility in repaying debts:

- Number and types of credit accounts
- How long each account has been open
- Amounts owed
- Amount of available credit used
- Whether bills are paid on time
- Number of recent credit inquiries

Employment status: Active employed / Unemployed.

Income: Monthly earnings.

Current liabilities: Any outstanding debts that they are still paying, as well as child support and other monthly payments.