# **Credit Risk DA Project**

## **Database Connection**

Download the DBeaver SQL client to connect to the MySQL database:

* <https://dbeaver.io/>

Follow the documentation to set up a connection to the database:

* <https://dbeaver.com/docs/wiki/Create-Connection/>

The database is hosted on AWS, here are the connection details:

* Endpoint: home-credit-default-risk.c7rizeij2t53.ap-southeast-1.rds.amazonaws.com
* Port: 3306
* Database: credit
* Login User: student
* Login Password: student

## **Overview**

Consider you are asked to review a list of loan applications. The given “credit” database contains data on the loan applicant and their historical loan behavior. There are many columns in the database, you **don’t need to use all the columns**, we will provide a list of useful column descriptions for you.

## **Cautions**

### **Missing Values:**

There are columns with missing values. You need to handle them during your analysis. There are multiple ways we can handle missing values: [4 Ways to Replace NULL with a Different Value in MySQL](https://database.guide/4-ways-to-replace-null-with-a-different-value-in-mysql/)

### **Discretization:**

Discretization means we want to convert numbers into bins, for example, age to age groups or income to income groups. There are mainly 2 reasons for this:

* It is easier to see patterns with a group of values. For example, it is better to say people older than 20 are richer than people younger than 20, instead of saying people aged 20 are richer than people aged 21.
* We want to avoid biased statistics. If we apply group by aggregation directly on a number column like age, the average statistics can be biased. For example, if there is only 1 person aged 59, then the average income of people aged 59 only represents that 1 person in the dataset.

We can do it with the CASE Function in MySQL:

[MySQL CASE Function](https://www.w3schools.com/sql/func_mysql_case.asp)

During the analysis, you can consider converting some factors into groups.

## **Task 1 Run SQL via DBeaver**

Follow the documentation to open the “SQL Editor”:

* <https://dbeaver.com/docs/wiki/SQL-Editor/>

Run SQL to examine the number of rows in each table:

|  |  |
| --- | --- |
| **Table** | **Count** |
| application | 307,511 |
| bureau | 1,716,428 |

## **Loan Applications**

The “application” table stores the loan applications. This includes:

* The demographic of the loan applicants
* The loan size or purposes
* The applicant’s credit score
* Is the loan applicant has a payment difficulties with the loan.

|  |  |
| --- | --- |
| SK\_ID\_CURR | ID of the loan in our sample |
| TARGET | Target variable, this is the **future information**.  Will this loan applicant has payment difficulties?    (1: client with payment difficulties: he/she had late payment more than X days, 0: no payment difficulties) |
| CODE\_GENDER | Gender of the client |
| FLAG\_OWN\_CAR | Flag if the client owns a car |
| FLAG\_OWN\_REALTY | Flag if the client owns a house or flat |
| CNT\_CHILDREN | Number of children the client has |
| AMT\_INCOME\_TOTAL | Income of the client |
| AMT\_CREDIT | Credit amount of the loan |
| AMT\_ANNUITY | Loan annuity |
| AMT\_GOODS\_PRICE | For consumer loans it is the price of the goods for which the loan is given |
| NAME\_TYPE\_SUITE | Who was accompanying client when he was applying for the loan |
| NAME\_INCOME\_TYPE | Clients income type (businessman, working, maternity leave,…) |
| NAME\_EDUCATION\_TYPE | Level of highest education the client achieved |
| NAME\_FAMILY\_STATUS | Family status of the client |
| NAME\_HOUSING\_TYPE | What is the housing situation of the client (renting, living with parents, ...) |
| DAYS\_BIRTH | Client's age in days at the time of application |
| DAYS\_EMPLOYED | How many days before the application the person started current employment |
| OCCUPATION\_TYPE | What kind of occupation does the client have |
| EXT\_SOURCE\_1 | Normalized credit score from an external data source |
| EXT\_SOURCE\_2 | Normalized credit score from an external data source |
| EXT\_SOURCE\_3 | Normalized credit score from an external data source |

### **Task 2 What is a Credit Score**

In the “application” table above there are 3 credit score columns. Research online to see what is a credit score and why we need it. (Note that the scores in the database are normalized, which means they are scaled to the 0 to 1 range)

|  |
| --- |
| A **credit score** is a numerical representation of a person's creditworthiness, indicating how likely they are to repay borrowed funds. It is derived from various factors in a person's credit history and helps lenders assess risk when considering a loan application. |

### **Task 3 Understand Credit Amount and Annuity**

What are Credit Amount and Annuity? Fill in your answer below:

|  |  |
| --- | --- |
| Credit Amount | **Credit Amount** refers to the total sum of money that a borrower is authorized to borrow from a lender. It can encompass various types of loans, such as personal loans, mortgages, or credit lines. The credit amount can be influenced by factors like the borrower’s credit score, income, and repayment history. Lenders evaluate these factors to determine how much credit they are willing to extend to the borrower. |
| Annuity | **An annuity** is a financial product that provides a series of payments made at equal intervals. Annuities are commonly used for retirement planning, where individuals can invest a lump sum of money and receive periodic payments over time. |

### **Task 4 Deduce the Loan Duration**

Given the information from Task 4, we should be able to deduce the Loan Duration for each application. Loan duration describes how many periods (months) the applicant will need to pay back their loans.

Paste the SQL and part of the results below:

|  |
| --- |
| **SELECT**  SK\_ID\_CURR,  TARGET,  AMT\_CREDIT,  AMT\_ANNUITY,  **CASE**  **WHEN** AMT\_ANNUITY > 0 **AND** AMT\_CREDIT > 0 **THEN** **ROUND**(AMT\_CREDIT / AMT\_ANNUITY, 2)  **ELSE** **NULL**  **END** **AS** *Loan\_Duration\_Months*  **FROM**  application  **WHERE**  AMT\_CREDIT **IS** **NOT** **NULL**  **AND** AMT\_ANNUITY **IS** **NOT** **NULL**; |

### **Task 5 Are there any factors in the application table affecting the Credit Scores?**

In the “application” table try to explore if there are any columns affecting the credit score. For example, is gender a factor?

**Do the analysis of at least 3 factors for 3 different credit scores**, it is expected to see different results for different credit scores, for example, a factor might affect EXT\_SOURCE\_1 but not EXT\_SOURCE\_3.

Please explain your findings with SQL statements and results:

|  |
| --- |
| 1. **Impact of Gender on Credit Scores**   **SELECT**  **CASE**  **WHEN** CODE\_GENDER = **'F'** **THEN** **'Female'**  **WHEN** CODE\_GENDER = **'M'** **THEN** **'Male'**  **ELSE** **'Other/Unknown'**  **END** **AS** *Gender*,  **COUNT**(\*) **AS** *Total\_Applicants*,  **SUM**(**CASE** **WHEN** EXT\_SOURCE\_1 **IS** **NULL** **THEN** 1 **ELSE** 0 **END**) **AS** *Total\_Null\_Ext\_Source\_1*,  **SUM**(**CASE** **WHEN** EXT\_SOURCE\_2 **IS** **NULL** **THEN** 1 **ELSE** 0 **END**) **AS** *Total\_Null\_Ext\_Source\_2*,  **SUM**(**CASE** **WHEN** EXT\_SOURCE\_3 **IS** **NULL** **THEN** 1 **ELSE** 0 **END**) **AS** *Total\_Null\_Ext\_Source\_3*,  **ROUND**(**AVG**(**COALESCE**(EXT\_SOURCE\_1, 0)), 4) **AS** *Avg\_Ext\_Source\_1*,  **ROUND**(**AVG**(**COALESCE**(EXT\_SOURCE\_2, 0)), 4) **AS** *Avg\_Ext\_Source\_2*,  **ROUND**(**AVG**(**COALESCE**(EXT\_SOURCE\_3, 0)), 4) **AS** *Avg\_Ext\_Source\_3*  **FROM**  application  **WHERE**  CODE\_GENDER **IS** **NOT** **NULL**  **GROUP** **BY**  **CASE**  **WHEN** CODE\_GENDER = **'F'** **THEN** **'Female'**  **WHEN** CODE\_GENDER = **'M'** **THEN** **'Male'**  **ELSE** **'Other/Unknown'**  **END**;  **Output:**     1. **Impact of Income Type on Credit Scores**   **SELECT**  NAME\_FAMILY\_STATUS **AS** *Family\_Status*,  **COUNT**(\*) **AS** *Total\_Applicants*,  **SUM**(**CASE** **WHEN** EXT\_SOURCE\_1 **IS** **NULL** **THEN** 1 **ELSE** 0 **END**) **AS** *Total\_Null\_Ext\_Source\_1*,  **SUM**(**CASE** **WHEN** EXT\_SOURCE\_2 **IS** **NULL** **THEN** 1 **ELSE** 0 **END**) **AS** *Total\_Null\_Ext\_Source\_2*,  **SUM**(**CASE** **WHEN** EXT\_SOURCE\_3 **IS** **NULL** **THEN** 1 **ELSE** 0 **END**) **AS** *Total\_Null\_Ext\_Source\_3*,  **ROUND**(**AVG**(**COALESCE**(EXT\_SOURCE\_1, 0)), 4) **AS** *Avg\_Ext\_Source\_1*,  **ROUND**(**AVG**(**COALESCE**(EXT\_SOURCE\_2, 0)), 4) **AS** *Avg\_Ext\_Source\_2*,  **ROUND**(**AVG**(**COALESCE**(EXT\_SOURCE\_3, 0)), 4) **AS** *Avg\_Ext\_Source\_3*  **FROM**  application  **WHERE**  NAME\_FAMILY\_STATUS **IS** **NOT** **NULL**  **GROUP** **BY**  *Family\_Status*  **ORDER** **BY**  *Total\_Applicants* **DESC**;  **Output:**     1. **Impact of Family Status on Credit Scores**   **SELECT**  NAME\_FAMILY\_STATUS **AS** *Family\_Status*,  **COUNT**(\*) **AS** *Total\_Applicants*,  **SUM**(**CASE** **WHEN** EXT\_SOURCE\_1 **IS** **NULL** **THEN** 1 **ELSE** 0 **END**) **AS** *Total\_Null\_Ext\_Source\_1*,  **SUM**(**CASE** **WHEN** EXT\_SOURCE\_2 **IS** **NULL** **THEN** 1 **ELSE** 0 **END**) **AS** *Total\_Null\_Ext\_Source\_2*,  **SUM**(**CASE** **WHEN** EXT\_SOURCE\_3 **IS** **NULL** **THEN** 1 **ELSE** 0 **END**) **AS** *Total\_Null\_Ext\_Source\_3*,  **ROUND**(**AVG**(**COALESCE**(EXT\_SOURCE\_1, 0)), 4) **AS** *Avg\_Ext\_Source\_1*,  **ROUND**(**AVG**(**COALESCE**(EXT\_SOURCE\_2, 0)), 4) **AS** *Avg\_Ext\_Source\_2*,  **ROUND**(**AVG**(**COALESCE**(EXT\_SOURCE\_3, 0)), 4) **AS** *Avg\_Ext\_Source\_3*  **FROM**  application  **WHERE**  NAME\_FAMILY\_STATUS **IS** **NOT** **NULL**  **GROUP** **BY**  *Family\_Status*  **ORDER** **BY**  *Total\_Applicants* **DESC**;  **Output:** |

### **Task 6 Are there any factors in the application table affecting the Credit Amount?**

Who is going to lend more money than others? In this task, we want to see are there any factors affecting the credit amount. **Do the analysis of at least 3 factors**

Please explain your findings with SQL statements and results:

|  |
| --- |
| 1. **Analysis by Income Level**   **SELECT**  **CASE**  **WHEN** AMT\_INCOME\_TOTAL **IS** **NULL** **OR** AMT\_INCOME\_TOTAL < 0 **THEN** **'Invalid Income'**  **WHEN** AMT\_INCOME\_TOTAL **BETWEEN** 0 **AND** 9999 **THEN** **'0 - 9,999'**  **WHEN** AMT\_INCOME\_TOTAL **BETWEEN** 10000 **AND** 19999 **THEN** **'10,000 - 19,999'**  **WHEN** AMT\_INCOME\_TOTAL **BETWEEN** 20000 **AND** 29999 **THEN** **'20,000 - 29,999'**  **WHEN** AMT\_INCOME\_TOTAL **BETWEEN** 30000 **AND** 39999 **THEN** **'30,000 - 39,999'**  **WHEN** AMT\_INCOME\_TOTAL **BETWEEN** 40000 **AND** 49999 **THEN** **'40,000 - 49,999'**  **WHEN** AMT\_INCOME\_TOTAL **BETWEEN** 50000 **AND** 59999 **THEN** **'50,000 - 59,999'**  **WHEN** AMT\_INCOME\_TOTAL **BETWEEN** 60000 **AND** 69999 **THEN** **'60,000 - 69,999'**  **WHEN** AMT\_INCOME\_TOTAL **BETWEEN** 70000 **AND** 79999 **THEN** **'70,000 - 79,999'**  **WHEN** AMT\_INCOME\_TOTAL **BETWEEN** 80000 **AND** 89999 **THEN** **'80,000 - 89,999'**  **WHEN** AMT\_INCOME\_TOTAL **BETWEEN** 90000 **AND** 99999 **THEN** **'90,000 - 99,999'**  **ELSE** **'100,000 and above'**  **END** **AS** *Income\_Level*,  **COUNT**(\*) **AS** *Total\_Applicants*,  **ROUND**(**AVG**(**COALESCE**(AMT\_CREDIT, 0)), 4) **AS** *Average\_Amount\_Credit*,  **ROUND**(**MAX**(**COALESCE**(AMT\_CREDIT, 0)), 4) **AS** *Max\_Amount\_Credit*,  **ROUND**(**MIN**(**COALESCE**(AMT\_CREDIT, 0)), 4) **AS** *Min\_Amount\_Credit*,  **ROUND**(STDDEV(**COALESCE**(AMT\_CREDIT, 0)), 4) **AS** *Std\_Dev\_Amount\_Credit*  **FROM**  application  **WHERE**  AMT\_INCOME\_TOTAL **IS** **NOT** **NULL** **AND** AMT\_INCOME\_TOTAL >= 0  **GROUP** **BY**  *Income\_Level*  **ORDER** **BY**  **MIN**(AMT\_INCOME\_TOTAL);  **Output**     1. **Analysis by Car Ownership**   **SELECT**  **COALESCE**(FLAG\_OWN\_CAR, **'Unknown'**) **AS** *Car\_Own*,  **COUNT**(\*) **AS** *Total\_Applicants*,  **ROUND**(**AVG**(**COALESCE**(AMT\_CREDIT, 0)), 4) **AS** *Avg\_Amount\_Credit*,  **ROUND**(STDDEV(**COALESCE**(AMT\_CREDIT, 0)), 4) **AS** *Std\_Dev\_Amount\_Credit*,  **ROUND**(**MIN**(**COALESCE**(AMT\_CREDIT, 0)), 4) **AS** *Min\_Amount\_Credit*,  **ROUND**(**MAX**(**COALESCE**(AMT\_CREDIT, 0)), 4) **AS** *Max\_Amount\_Credit*  **FROM**  application  **GROUP** **BY**  *Car\_Own*  **ORDER** **BY**  *Car\_Own*;  **Output**     1. **Analysis by Family Status**   **SELECT**  NAME\_FAMILY\_STATUS **AS** *Family\_Status*,  **COUNT**(\*) **AS** *Total\_Applicants*,  **ROUND**(**AVG**(**COALESCE**(AMT\_CREDIT, 0)), 4) **AS** *Avg\_Amt\_Credit*,  **ROUND**(**MAX**(**COALESCE**(AMT\_CREDIT, 0)), 4) **AS** *Max\_Amt\_Credit*,  **ROUND**(**MIN**(**COALESCE**(AMT\_CREDIT, 0)), 4) **AS** *Min\_Amt\_Credit*,  **ROUND**(STDDEV(**COALESCE**(AMT\_CREDIT, 0)), 4) **AS** *Std\_Dev\_Amt\_Credit*  **FROM**  application  **GROUP** **BY**  NAME\_FAMILY\_STATUS -- Removed extra comma here  **ORDER** **BY**  *Avg\_Amt\_Credit* **DESC**;  **Output** |

### Task 7 Are there any factors in the application table affecting the Payment Difficulties?

In the database, the TARGET column describes will there be a payment difficulty for a loan. We want to see if there are any factors in the application table that can be used to predict this future information. **Do the analysis of at least 3 factors**

Please explain your findings with SQL statements and results:

|  |
| --- |
| 1. **Analysis by Employment Length**   **SELECT**  **CASE**  **WHEN** DAYS\_EMPLOYED **IS** **NULL** **THEN** **'Unknown'**  **WHEN** DAYS\_EMPLOYED < -1000 **THEN** **'Unemployed'**  **WHEN** DAYS\_EMPLOYED **BETWEEN** -1000 **AND** -730 **THEN** **'Short-Term Employment (1-2 years)'**  **WHEN** DAYS\_EMPLOYED **BETWEEN** -729 **AND** -365 **THEN** **'Short-Term Employment (Less than 1 year)'**  **WHEN** DAYS\_EMPLOYED **BETWEEN** -364 **AND** -183 **THEN** **'Currently Employed (6 months - 1 year)'**  **WHEN** DAYS\_EMPLOYED **BETWEEN** -182 **AND** 0 **THEN** **'Currently Employed (Less than 6 months)'**  **WHEN** DAYS\_EMPLOYED **BETWEEN** 1 **AND** 183 **THEN** **'New Employment (Less than 6 months)'**  **ELSE** **'Long-Term Employment (More than 1 year)'**  **END** **AS** *Employment\_Status*,  **COUNT**(\*) **AS** *Total\_Applicants*,  **SUM**(TARGET) **AS** *Total\_Payment\_Difficulties*,  **ROUND**(**AVG**(TARGET), 2) **AS** *Avg\_Payment\_Difficulty*,  **ROUND**(**AVG**(TARGET) \* 100, 2) **AS** *Percentage\_Payment\_Difficulties*  **FROM**  application  **WHERE**  TARGET **IS** **NOT** **NULL**  **GROUP** **BY**  *Employment\_Status*  **ORDER** **BY**  *Avg\_Payment\_Difficulty* **DESC**;  **Output**     1. **Analysis by Family Status**   **SELECT**  NAME\_FAMILY\_STATUS **AS** *Family\_Status*,  **COUNT**(\*) **AS** *Total\_Applicants*,  **ROUND**(**SUM**(TARGET), 2) **AS** *Total\_Payment\_Difficulties*,  **ROUND**(**AVG**(TARGET), 2) **AS** *Avg\_Payment\_Difficulty*,  **ROUND**(**AVG**(TARGET) \* 100, 2) **AS** *Percentage\_Payment\_Difficulties*  **FROM**  application  **WHERE**  TARGET **IS** **NOT** **NULL**  **GROUP** **BY**  *Family\_Status*  **ORDER** **BY**  *Percentage\_Payment\_Difficulties* **DESC**;  **Output**     1. **Analysis by Income Level**   **SELECT**  **CASE**  **WHEN** AMT\_INCOME\_TOTAL **IS** **NULL** **OR** AMT\_INCOME\_TOTAL < 0 **THEN** **'Invalid Income'**  **WHEN** AMT\_INCOME\_TOTAL **BETWEEN** 0 **AND** 9999 **THEN** **'0 - 9,999'**  **WHEN** AMT\_INCOME\_TOTAL **BETWEEN** 10000 **AND** 19999 **THEN** **'10,000 - 19,999'**  **WHEN** AMT\_INCOME\_TOTAL **BETWEEN** 20000 **AND** 29999 **THEN** **'20,000 - 29,999'**  **WHEN** AMT\_INCOME\_TOTAL **BETWEEN** 30000 **AND** 39999 **THEN** **'30,000 - 39,999'**  **WHEN** AMT\_INCOME\_TOTAL **BETWEEN** 40000 **AND** 49999 **THEN** **'40,000 - 49,999'**  **WHEN** AMT\_INCOME\_TOTAL **BETWEEN** 50000 **AND** 59999 **THEN** **'50,000 - 59,999'**  **WHEN** AMT\_INCOME\_TOTAL **BETWEEN** 60000 **AND** 69999 **THEN** **'60,000 - 69,999'**  **WHEN** AMT\_INCOME\_TOTAL **BETWEEN** 70000 **AND** 79999 **THEN** **'70,000 - 79,999'**  **WHEN** AMT\_INCOME\_TOTAL **BETWEEN** 80000 **AND** 89999 **THEN** **'80,000 - 89,999'**  **WHEN** AMT\_INCOME\_TOTAL **BETWEEN** 90000 **AND** 99999 **THEN** **'90,000 - 99,999'**  **ELSE** **'100,000 and above'**  **END** **AS** *Income\_Level*,  **COUNT**(\*) **AS** *Total\_Applicants*,  **ROUND**(**AVG**(AMT\_INCOME\_TOTAL), 2) **AS** *Avg\_Income*,  **MIN**(AMT\_INCOME\_TOTAL) **AS** *Min\_Income*,  **MAX**(AMT\_INCOME\_TOTAL) **AS** *Max\_Income*,  **SUM**(TARGET) **AS** *Total\_Payment\_Difficulties*,  **ROUND**(**SUM**(TARGET) \* 100.0 / **COUNT**(\*), 2) **AS** *Percentage\_Payment\_Difficulties*,  **ROUND**(**AVG**(TARGET), 2) **AS** *Avg\_Payment\_Difficulty*  **FROM**  application  **GROUP** **BY**  *Income\_Level*  **ORDER** **BY**  **MIN**(AMT\_INCOME\_TOTAL);  **Output** |

## **Previous/Other Loan Applications**

In the previous section, we explored if the demographic data related to payment difficulties, this section we want to see if **historical loan behavior** affecting the payment difficulties.

The “bureau” table stores the other loans of the applicants from the other lenders.

“bureau” table:

|  |  |
| --- | --- |
| SK\_ID\_CURR | ID of loan in our sample - one loan in our sample can have 0,1,2 or more related previous credits in credit bureau |
| SK\_BUREAU\_ID | Recoded ID of previous Credit Bureau credit related to our loan (unique coding for each loan application), The IDs of the “other loans” |
| CREDIT\_DAY\_OVERDUE | Number of days past due on CB credit at the time of application for related loan in our sample |
| AMT\_CREDIT\_MAX\_OVERDUE | Maximal amount overdue on the Credit Bureau credit so far (at application date of loan in our sample) |
| CNT\_CREDIT\_PROLONG | How many times was the Credit Bureau credit prolonged |
| AMT\_CREDIT\_SUM | Current credit amount for the Credit Bureau credit |
| AMT\_CREDIT\_SUM\_DEBT | Current debt on Credit Bureau credit |
| AMT\_CREDIT\_SUM\_LIMIT | Current credit limit of credit card reported in Credit Bureau |
| AMT\_CREDIT\_SUM\_OVERDUE | Current amount overdue on Credit Bureau credit |
| CREDIT\_TYPE | Type of Credit Bureau credit (Car, cash,...) |
| DAYS\_CREDIT\_UPDATE | How many days before loan application did last information about the Credit Bureau credit come |
| AMT\_ANNUITY | Annuity of the Credit Bureau credit |

### 

### Task 7 Is the number of other loans affecting the payment difficulties?

We want to see if loan applicants have other historical loans affecting their payment abilities. Hints:

* You will need to count the number of loans for each SK\_ID\_CURR in the “bureau” table.
* Transform the counts into count groups (Discretization).
* Compute the relation between average other loan count to the TARGET

Paste the SQL and part of the results below:

|  |
| --- |
| **SELECT**  **CASE**  **WHEN** *Total\_Loan* = 0 **THEN** **'0 Loans'**  **WHEN** *Total\_Loan* **BETWEEN** 1 **AND** 2 **THEN** **'1-2 Loans'**  **WHEN** *Total\_Loan* **BETWEEN** 3 **AND** 4 **THEN** **'3-4 Loans'**  **WHEN** *Total\_Loan* **BETWEEN** 5 **AND** 6 **THEN** **'5-6 Loans'**  **ELSE** **'7+ Loans'**  **END** **AS** *Loan\_Group*,  **AVG**(*a*.TARGET) \* 100 **AS** *Average\_Payment\_Difficulty\_Percent*,  **COUNT**(*a*.SK\_ID\_CURR) **AS** *Number\_of\_Applicants*  **FROM** (  **SELECT**  SK\_ID\_CURR,  **COUNT**(\*) **AS** *Total\_Loan*  **FROM**  bureau  **GROUP** **BY**  SK\_ID\_CURR  ) **AS** *Total\_Loans*  **JOIN**  application *a* **ON** *Total\_Loans*.SK\_ID\_CURR = *a*.SK\_ID\_CURR  **GROUP** **BY**  *Loan\_Group*  **ORDER** **BY**  *Loan\_Group*;  **Output:** |

## Task 8 FreeStyle

Now, conduct your own research and analysis to see what factors from the “application” and the “bureau” tables are affecting

* The Credit Scores
* The Payment Difficulty