**Take-home test for Card Fraud Analyst.**

*Here below you have 3 assignments, please upload the file containing your solutions through the link provided via email.*

*After we have looked at your responses, we will get back to you and let you know how we proceed. Good luck!*

**Assignment I:**

You are in the process of reviewing card Fraud related activity and in particular merchants activity and possible trends, with analysis on transactions at select merchants over the last 30 days shown below. Define and explain the next steps you would take to prevent further losses at the following merchants, and indicate which merchants you would prioritise (rank them!) for preventative measures.

False Positive Ratio = Number of False Positives : Number of True Positives

| Merchant Name | Transaction Type | Fraud Loss ($) | False Positive Ratio | Total Number of Transactions (last 30 days) | Fraud Prevention Action & Reasoning |
| --- | --- | --- | --- | --- | --- |
| Tickedek | ECOM | 15,000 | 89:1 | 1350 |  |
| Sp\* Natilaus | POS | 3,500 | 2:1 | 9 |  |
| Shinet.com | ECOM | 6,000 | 12:1 | 156 |  |
| Bet350 | ECOM | 14,000 | 5:1 | 18 |  |

**Assignment II:**

You will find tables commonly used by our Card Fraud Team in the appendix (**pages 4-6**). The **REPORTS.PLASTIC\_TRANSACTION** table contains information on all card transactions, and the **REPORTS.DISPUTED\_TRANSACTIONS** table contains information on all disputed card transactions.

Please use these tables in your responses to the following questions:

a) You have noticed a wave of valid fraud disputes being reported at the ecommerce merchant **“Choco Life”** over the last week. The transactions are largely being reported on our MasterCard UK cards.

Write a sample SQL query you would use to calculate the fraud density at the merchant, with the focus on reducing false positives and creating a prevention strategy. You are free to decide on an appropriate lookback time frame for calculating the fraud density at this merchant.

b) While you are investigating the fraud density at **Choco Life**, an agent reports that the team has observed that a number of these fraudulent transactions have occurred approximately 5 minutes after zero-dollar card testers were made at merchant “**TokenEx**”.

Write a sample SQL query you would use to calculate the fraud density for transactions at **Choco Life** occurring after zero-dollar card testers were made at **TokenEx**.

**Assignment III**

*You notice that our card fraud prevention alerting system is producing high levels of false positive alerts around a specific rule to prevent card-present fraud, meaning that Customers are unnecessarily inconvenienced with restricted access to their cards until the alert is manually dealt with by an agent. Once you flag this issue, you are asked to provide a Quality Control review of this alert creation procedure.*

What focus areas and possible action items would your investigation suggest in your final write up?

**Appendix: Tables for Assignment II**

| **REPORTS.PLASTIC\_TRANSACTION** | | | |
| --- | --- | --- | --- |
| **Column name** | **Type** | **Description** | **Example** |
| CREATION\_TIME | TIMESTAMP\_NTZ | When the transaction was created | 2020-03-01 18:18:18.473850000 |
| TRANSACTION\_ID | INTEGER | plastic transaction id | 52682368 |
| CARD\_TOKEN | TEXT | the tokenized card | 8ecc3c28-5057-49c4-b2ef-68f26a5f8fc9 |
| MERCHANT\_COUNTRY | TEXT | where the merchant is allocated | GB |
| DETAILS\_TYPE | TEXT | type of transaction | ECOM\_PURCHASE,  POS\_PURCHASE |
| POS\_ENTRY\_MODE | TEXT | how was the entry mode in the purchase | CONTACTLESS |
| DETAILS\_CARD\_OWNERSHIP\_PROOF | TEXT | How the ownership identity was validated | PIN |
| TERMINAL\_ID | TEXT |  | 28897203 |
| CARD\_PRESENCE | TEXT | Info whether it was a card present or a card not present transaction | Present |
| MERCHANT\_NAME | TEXT | Merchant Name | DIGITALOCEAN COM |
| MERCHANT\_ID | TEXT | Merchant ID | 7600016737 |
| MERCHANT\_CITY | TEXT | City where the merchant is | NEW YORK CITY |
| MERCHANT\_ZIP | TEXT | Zipcode | 75018 |
| MCC | TEXT | four-digit number listed in ISO 18245 for retail financial services | 9399 |
| USER\_ID | INTEGER | Users’ user id | 7379887 |
| PROGRAM | TEXT | Program from where the user registered in Wise | MC\_DEBIT\_UK, MC\_DEBIT\_US, MC\_DEBIT\_SG |
| AMOUNT\_CURRENCY | TEXT | authorization info | EUR |
| AMOUNT | INTEGER | authorization info | 6 |
| AMOUNT\_GBP | DECIMAL | authorization info | 5.49959214 |
| DECLINE\_REASON | TEXT | reason why auth transaction was declined | INSUFFICIENT\_FUNDS |
| PAYMENT\_TOKEN | TEXT | PAYMENT\_TOKEN | 2ae46a4d2b4fe3c491475604406e71a355f7ade63179a0fb84f8d330f7740c19 |

| **REPORTS.DISPUTED\_TRANSACTIONS** | | | |
| --- | --- | --- | --- |
| **Column name** | **Type** | **Description** | **Example** |
| TRANSACTION\_ID | INTEGER | Transaction ID | 128619274 |
| DATETIME\_TRANSACTION\_CREATION | TIMESTAMP\_NTZ | When the transaction was created | 2020-03-01 18:18:18.473850000 |
| CARD\_TOKEN | TEXT | Tokenized card | 867b2ab2-007d-4941-aa6d-ab17676ef4b1 |
| USER\_ID | INTEGER | Users’s user id | 5512413 |
| MERCHANT\_NAME | TEXT | Merchant name | Amazon Music |
| MCC | TEXT | four-digit number listed in ISO 18245 for retail financial services | 8211 |
| CASE\_ID | INTEGER | the dispute’s case id | 125898 |
| DATETIME\_DISPUTE\_CREATION | TIMESTAMP\_NTZ | when the transaction was disputed | 2020-03-01 18:18:18.473850000 |
| DISPUTE\_STATE | TEXT | if the dispute is valid or not | VALID, INVALID |
| SAFE\_CATEGORY | TEXT | Type of dispute | 00 Lost Fraud |