

# EDA Report

Experiment: eda

Generated: 2026-01-29 14:26:36

## Overview - Metrics

- rows: 10000
- rows\_original: 200000
- columns: 34
- data\_path: .\data\synthetic\_bank\_aml\_200k.csv
- duplicate\_ratio: 0.0
- numeric\_columns: txn\_amount, account\_age\_days, kyc\_risk\_score, num\_txn\_24h, avg\_amount\_7d, is\_pep,
- sanctions\_match, is\_cross\_border, is\_fintech\_rail, origin\_country\_code, destination\_country\_code,
- ip\_country\_code, currency\_code, txn\_channel\_code, payment\_rail\_code, txn\_type\_code, merchant\_category\_code,
- device\_type\_code, is\_suspicious
- categorical\_columns: currency, origin\_country, destination\_country, txn\_channel, payment\_rail, txn\_type,
- merchant\_category, device\_type, ip\_country
- datetime\_columns:
- text\_columns: txn\_id, txn\_datetime, customer\_id, account\_id, counterparty\_account\_id, device\_id
- boolean\_columns:
- other\_columns:
- unique\_counts.txn\_id: 10000
- unique\_counts.txn\_datetime: 5807
- unique\_counts.customer\_id: 9066
- unique\_counts.account\_id: 9395
- unique\_counts.counterparty\_account\_id: 9630
- unique\_counts.txn\_amount: 8656
- unique\_counts.currency: 14
- unique\_counts.origin\_country: 18
- unique\_counts.destination\_country: 18
- unique\_counts.txn\_channel: 5
- unique\_counts.payment\_rail: 14
- unique\_counts.txn\_type: 8
- unique\_counts.merchant\_category: 10
- unique\_counts.device\_type: 4
- unique\_counts.device\_id: 9756
- unique\_counts.ip\_country: 18
- unique\_counts.account\_age\_days: 3422
- unique\_counts.kyc\_risk\_score: 4881
- unique\_counts.num\_txn\_24h: 78
- unique\_counts.avg\_amount\_7d: 6018
- unique\_counts.is\_pep: 2
- unique\_counts.sanctions\_match: 2
- unique\_counts.is\_cross\_border: 2
- unique\_counts.is\_fintech\_rail: 2
- unique\_counts.origin\_country\_code: 18
- unique\_counts.destination\_country\_code: 18
- unique\_counts.ip\_country\_code: 18
- unique\_counts.currency\_code: 14
- unique\_counts.txn\_channel\_code: 5
- unique\_counts.payment\_rail\_code: 14
- unique\_counts.txn\_type\_code: 8

# Overview - Metrics

- unique\_counts.merchant\_category\_code: 10
- unique\_counts.device\_type\_code: 4
- unique\_counts.is\_suspicious: 2

## Overview - Explanation

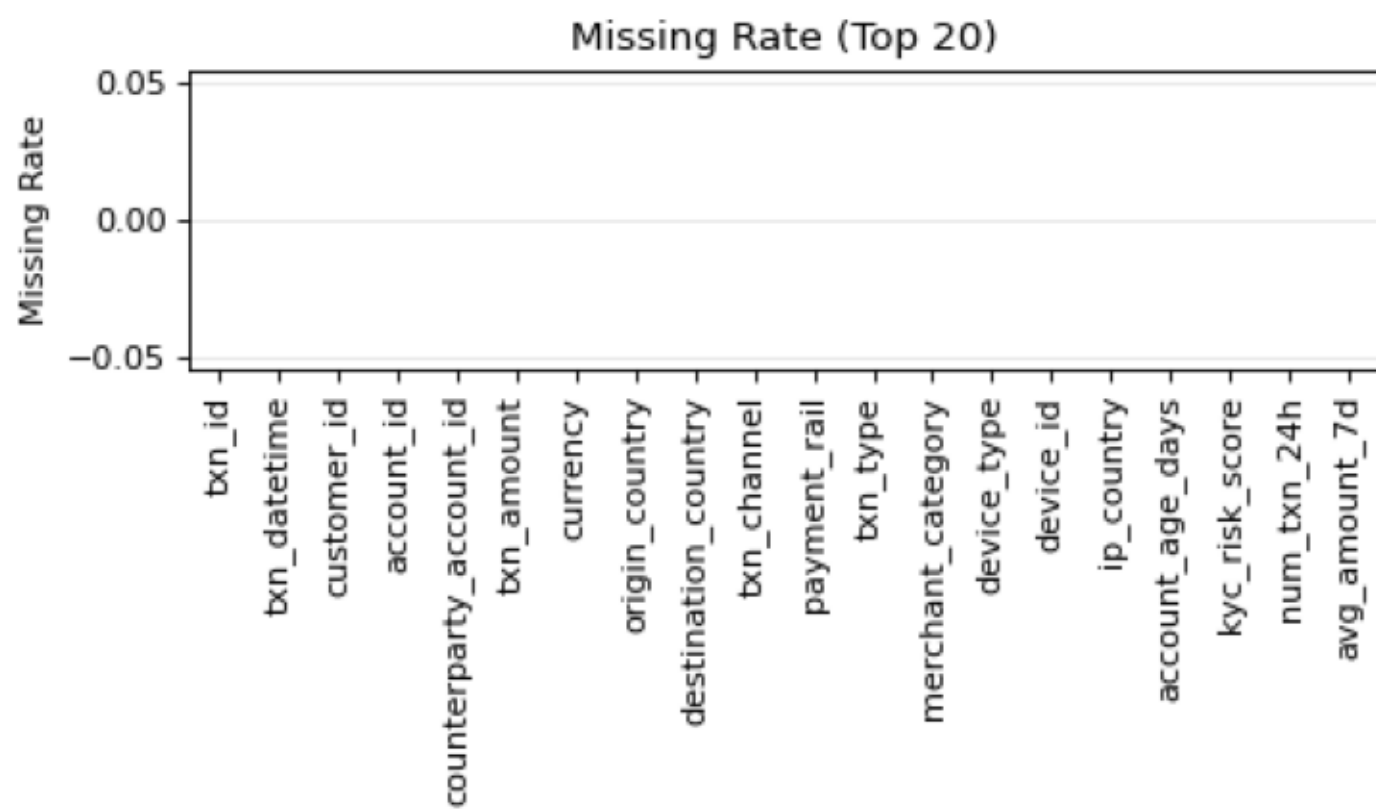
- Dataset has 10000 rows and 34 columns.
- Rows limited to first 10000 of 200000 for analysis.
- Duplicate row ratio is 0.00%.
- Numeric columns: ['txn\_amount', 'account\_age\_days', 'kyc\_risk\_score', 'num\_txn\_24h', 'avg\_amount\_7d',
- 'is\_pep', 'sanctions\_match', 'is\_cross\_border', 'is\_fintech\_rail', 'origin\_country\_code',
- 'destination\_country\_code', 'ip\_country\_code', 'currency\_code', 'txn\_channel\_code', 'payment\_rail\_code',
- 'txn\_type\_code', 'merchant\_category\_code', 'device\_type\_code', 'is\_suspicious'].
- Categorical columns: ['currency', 'origin\_country', 'destination\_country', 'txn\_channel', 'payment\_rail',
- 'txn\_type', 'merchant\_category', 'device\_type', 'ip\_country'].
- Target 'is\_suspicious' distribution: {0: 9434, 1: 566}.

## Missingness - Metrics

- missing\_rate.txn\_id: 0.0
- missing\_rate.txn\_datetime: 0.0
- missing\_rate.customer\_id: 0.0
- missing\_rate.account\_id: 0.0
- missing\_rate.counterparty\_account\_id: 0.0
- missing\_rate.txn\_amount: 0.0
- missing\_rate.currency: 0.0
- missing\_rate.origin\_country: 0.0
- missing\_rate.destination\_country: 0.0
- missing\_rate.txn\_channel: 0.0
- missing\_rate.payment\_rail: 0.0
- missing\_rate.txn\_type: 0.0
- missing\_rate.merchant\_category: 0.0
- missing\_rate.device\_type: 0.0
- missing\_rate.device\_id: 0.0
- missing\_rate.ip\_country: 0.0
- missing\_rate.account\_age\_days: 0.0
- missing\_rate.kyc\_risk\_score: 0.0
- missing\_rate.num\_txn\_24h: 0.0
- missing\_rate.avg\_amount\_7d: 0.0
- missing\_rate.is\_pep: 0.0
- missing\_rate.sanctions\_match: 0.0
- missing\_rate.is\_cross\_border: 0.0
- missing\_rate.is\_fintech\_rail: 0.0
- missing\_rate.origin\_country\_code: 0.0
- missing\_rate.destination\_country\_code: 0.0
- missing\_rate.ip\_country\_code: 0.0
- missing\_rate.currency\_code: 0.0
- missing\_rate.txn\_channel\_code: 0.0
- missing\_rate.payment\_rail\_code: 0.0
- missing\_rate.txn\_type\_code: 0.0
- missing\_rate.merchant\_category\_code: 0.0
- missing\_rate.device\_type\_code: 0.0
- missing\_rate.is\_suspicious: 0.0

## Missingness - Explanation

- Highest missing rate is 0.00% in column 'txn\_id'.



## Numeric - Metrics

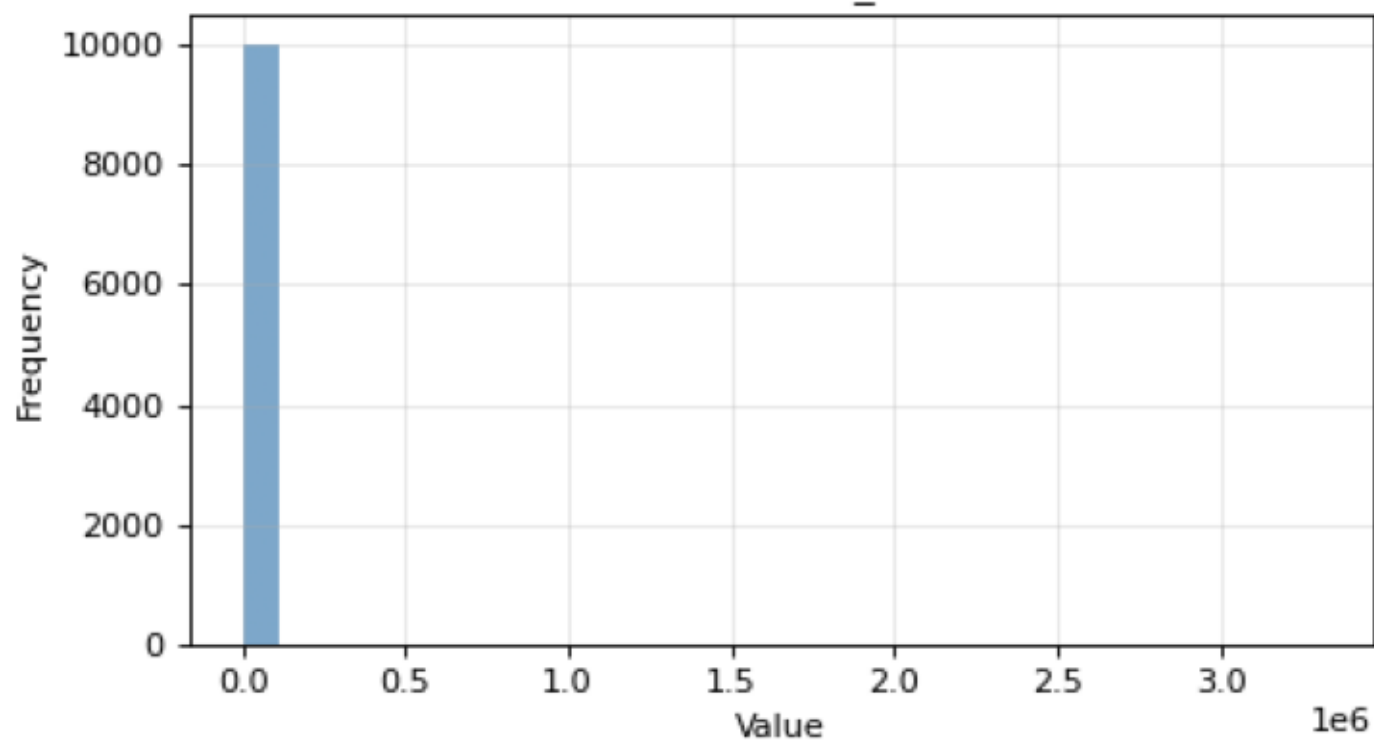
- numeric\_stats.txn\_amount.count: 10000.0
- numeric\_stats.txn\_amount.mean: 1376.221343
- numeric\_stats.txn\_amount.std: 38100.346482
- numeric\_stats.txn\_amount.min: 0.25
- numeric\_stats.txn\_amount.25%: 39.7675
- numeric\_stats.txn\_amount.50%: 101.7
- numeric\_stats.txn\_amount.75%: 326.2725
- numeric\_stats.txn\_amount.max: 3303207.4
- numeric\_stats.account\_age\_days.count: 10000.0
- numeric\_stats.account\_age\_days.mean: 1828.0079
- numeric\_stats.account\_age\_days.std: 1043.588943
- numeric\_stats.account\_age\_days.min: 1.0
- numeric\_stats.account\_age\_days.25%: 925.0
- numeric\_stats.account\_age\_days.50%: 1841.0
- numeric\_stats.account\_age\_days.75%: 2731.0
- numeric\_stats.account\_age\_days.max: 3649.0
- numeric\_stats.avg\_amount\_7d.count: 10000.0
- numeric\_stats.avg\_amount\_7d.mean: 45.83933
- numeric\_stats.avg\_amount\_7d.std: 45.298215
- numeric\_stats.avg\_amount\_7d.min: 1.28
- numeric\_stats.avg\_amount\_7d.25%: 19.3
- numeric\_stats.avg\_amount\_7d.50%: 32.52
- numeric\_stats.avg\_amount\_7d.75%: 55.77
- numeric\_stats.avg\_amount\_7d.max: 962.89
- numeric\_stats.kyc\_risk\_score.count: 10000.0
- numeric\_stats.kyc\_risk\_score.mean: 36.333385
- numeric\_stats.kyc\_risk\_score.std: 16.628474
- numeric\_stats.kyc\_risk\_score.min: 0.0
- numeric\_stats.kyc\_risk\_score.25%: 25.1975
- numeric\_stats.kyc\_risk\_score.50%: 35.69
- numeric\_stats.kyc\_risk\_score.75%: 46.24
- numeric\_stats.kyc\_risk\_score.max: 100.0
- numeric\_stats.num\_txn\_24h.count: 10000.0
- numeric\_stats.num\_txn\_24h.mean: 3.2845
- numeric\_stats.num\_txn\_24h.std: 7.820018
- numeric\_stats.num\_txn\_24h.min: 0.0
- numeric\_stats.num\_txn\_24h.25%: 1.0
- numeric\_stats.num\_txn\_24h.50%: 2.0
- numeric\_stats.num\_txn\_24h.75%: 3.0
- numeric\_stats.num\_txn\_24h.max: 83.0



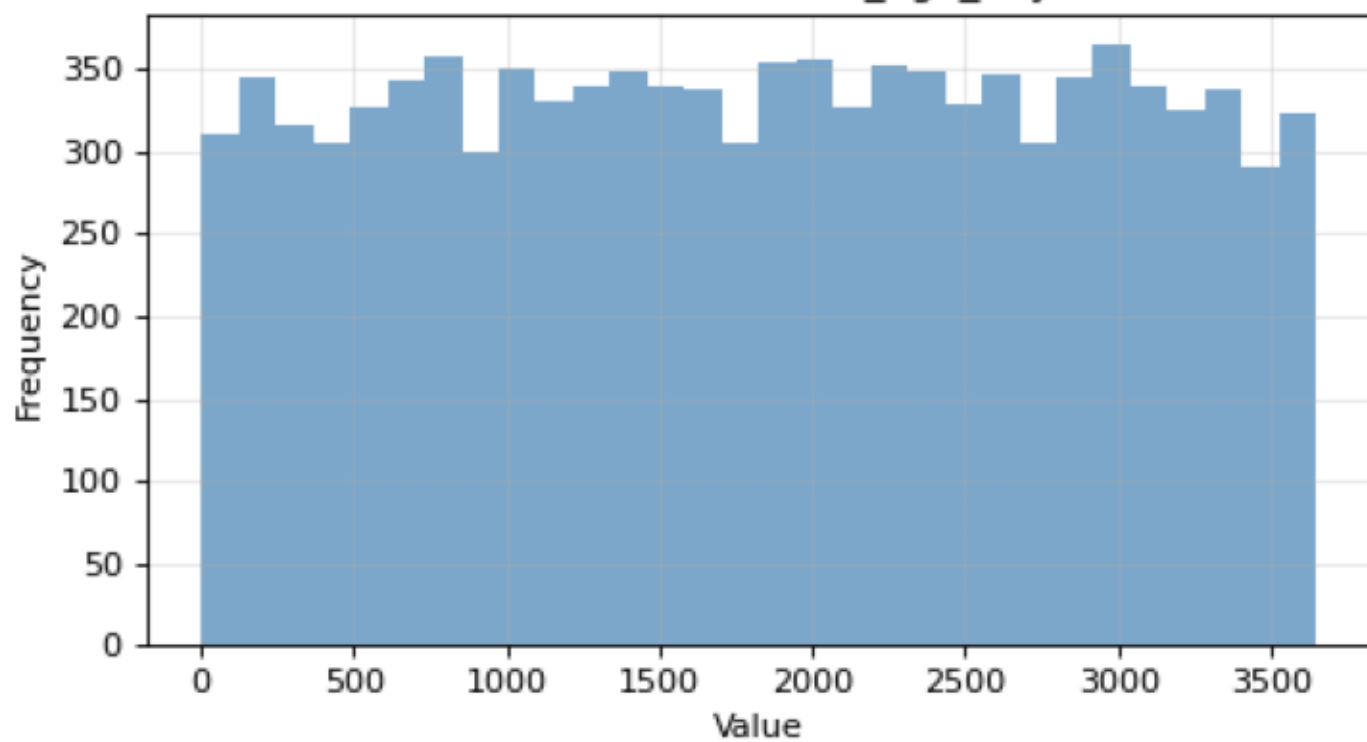
# Numeric - Explanation

- Numeric columns analyzed (top 5 by variance): ['txn\_amount', 'account\_age\_days', 'avg\_amount\_7d',
- 'kyc\_risk\_score', 'num\_txn\_24h'].

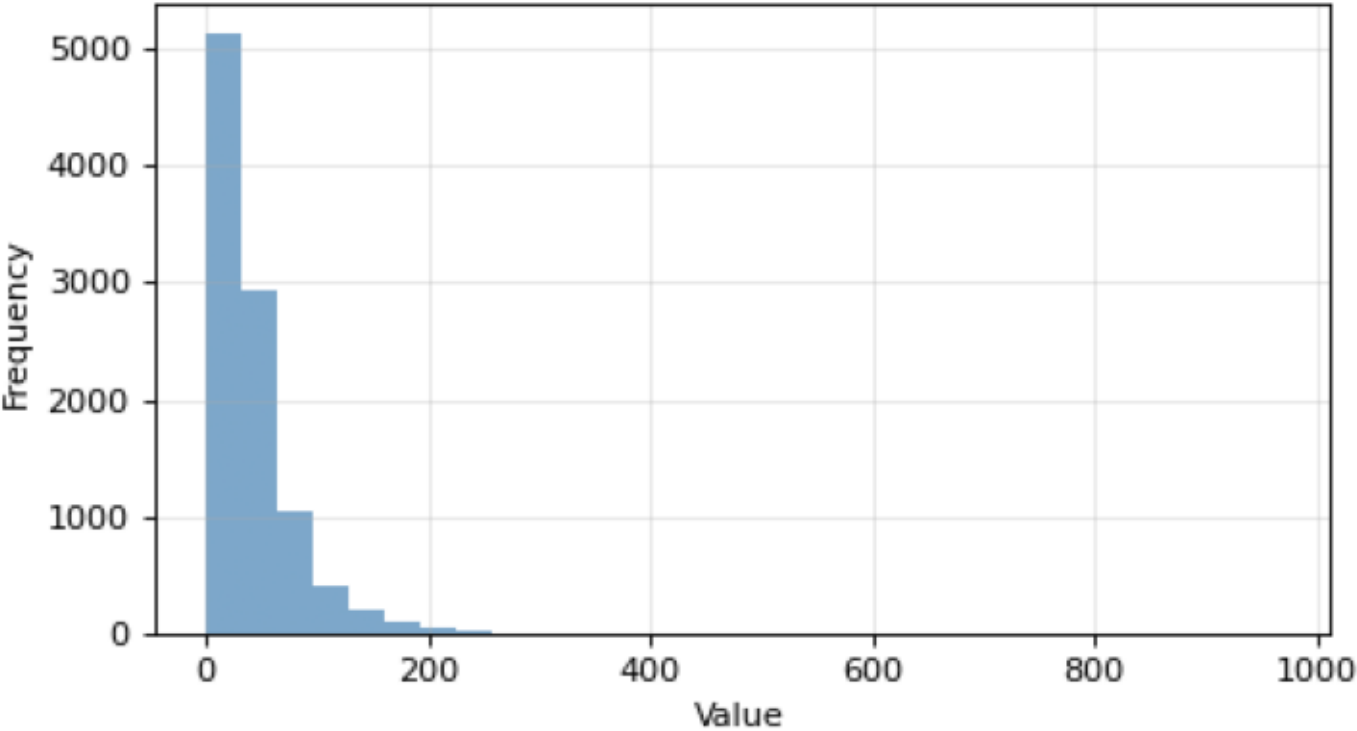
Distribution: txn\_amount



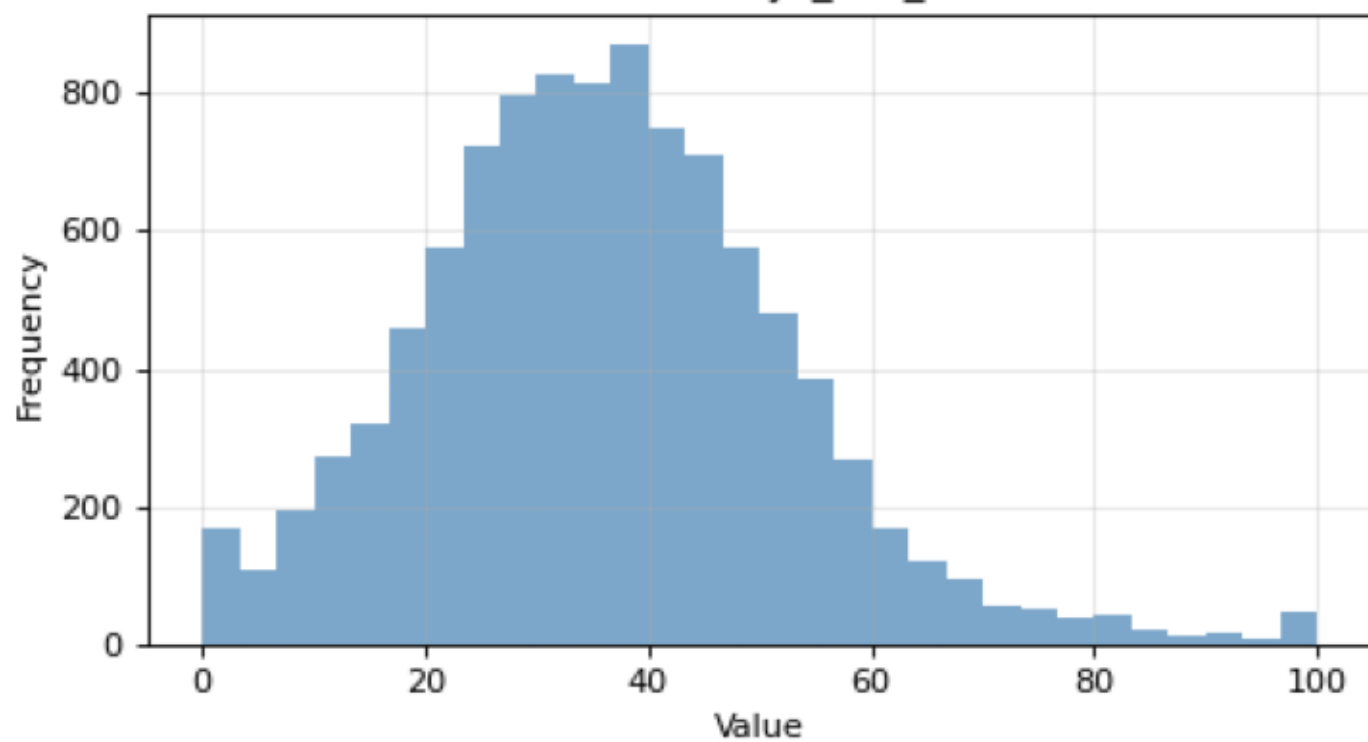
Distribution: account\_age\_days



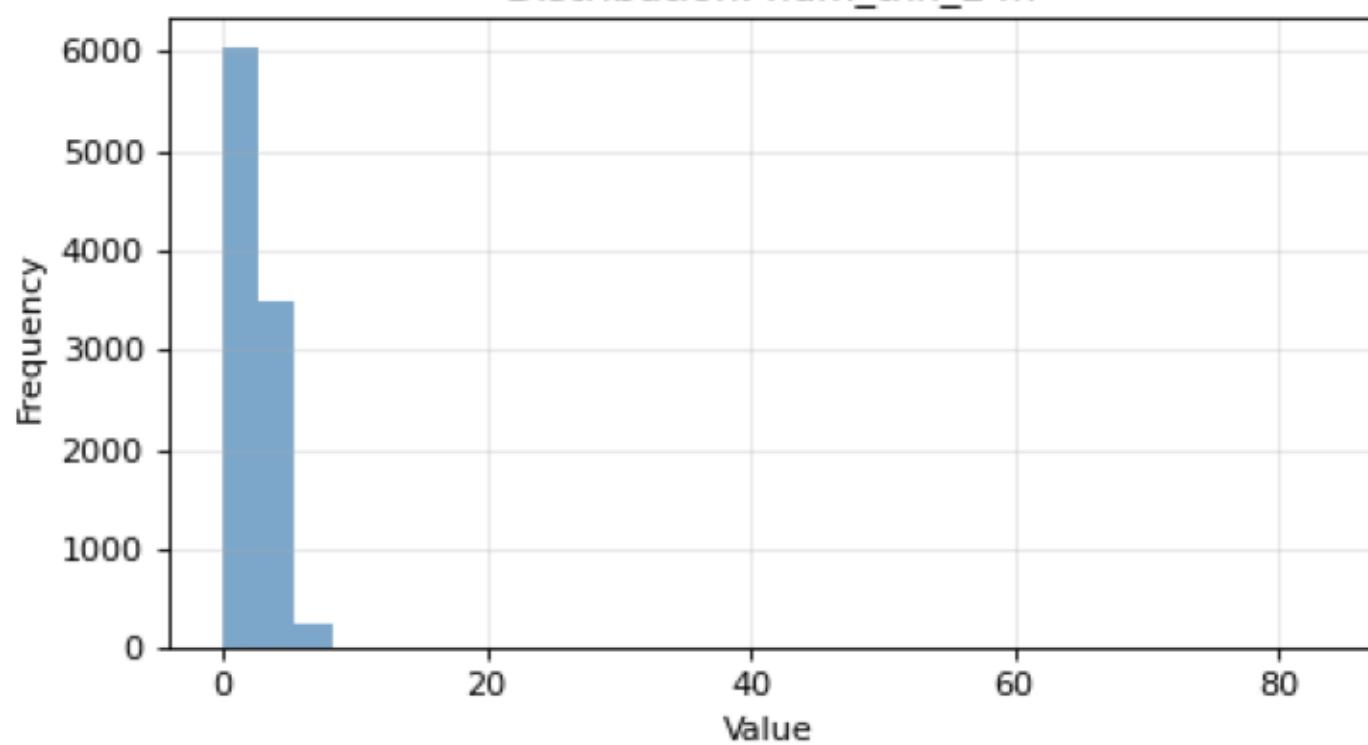
Distribution: avg\_amount\_7d



Distribution: kyc\_risk\_score



Distribution: num\_txn\_24h



## Categorical - Metrics

- top\_categories.txn\_id.4e1a9822-0abb-438b-a848-c57900e521c5: 1
- top\_categories.txn\_id.f52241a2-cd41-4367-b2bb-40c92cab0c8: 1
- top\_categories.txn\_id.ce7bcf00-b8ce-4d14-a71b-c58a927ce4c0: 1
- top\_categories.txn\_id.0a4b48e7-5b31-4ff7-b279-6303d9415ce4: 1
- top\_categories.txn\_id.cd37d77a-99a8-447a-aebc-0ea43b8921e2: 1
- top\_categories.txn\_id.f196d2df-274a-47ac-abdf-f6e22b1289aa: 1
- top\_categories.txn\_id.8999582c-3d00-4055-a7a8-315b47c9b14a: 1
- top\_categories.txn\_id.c9f4e697-eb51-4828-bd4a-aa9126def013: 1
- top\_categories.txn\_id.ef9cf89a-2acd-4320-8ba2-13e98b1d56f9: 1
- top\_categories.txn\_id.5e8920a0-deb7-44c4-b4dd-e762eafd9422: 1
- top\_categories.device\_id.DEV\_102034: 3
- top\_categories.device\_id.DEV\_142530: 3
- top\_categories.device\_id.DEV\_105243: 3
- top\_categories.device\_id.DEV\_077448: 3
- top\_categories.device\_id.DEV\_115986: 3
- top\_categories.device\_id.DEV\_010495: 2
- top\_categories.device\_id.DEV\_075734: 2
- top\_categories.device\_id.DEV\_156525: 2
- top\_categories.device\_id.DEV\_063318: 2
- top\_categories.device\_id.DEV\_053168: 2
- top\_categories.counterparty\_account\_id.CP\_119314: 3
- top\_categories.counterparty\_account\_id.CP\_008418: 3
- top\_categories.counterparty\_account\_id.CP\_030639: 3
- top\_categories.counterparty\_account\_id.CP\_025554: 3
- top\_categories.counterparty\_account\_id.CP\_027101: 3
- top\_categories.counterparty\_account\_id.CP\_033181: 3
- top\_categories.counterparty\_account\_id.CP\_090031: 3
- top\_categories.counterparty\_account\_id.CP\_078965: 3
- top\_categories.counterparty\_account\_id.CP\_077466: 3
- top\_categories.counterparty\_account\_id.CP\_111645: 3
- top\_categories.account\_id.ACCT\_053715: 3
- top\_categories.account\_id.ACCT\_011321: 3
- top\_categories.account\_id.ACCT\_044037: 3
- top\_categories.account\_id.ACCT\_031017: 3
- top\_categories.account\_id.ACCT\_052398: 3
- top\_categories.account\_id.ACCT\_076934: 3
- top\_categories.account\_id.ACCT\_076070: 3
- top\_categories.account\_id.ACCT\_062282: 3
- top\_categories.account\_id.ACCT\_038570: 3
- top\_categories.account\_id.ACCT\_011947: 3
- top\_categories.customer\_id.CUST\_012892: 4
- top\_categories.customer\_id.CUST\_009760: 4
- top\_categories.customer\_id.CUST\_030774: 4
- top\_categories.customer\_id.CUST\_006169: 3
- top\_categories.customer\_id.CUST\_011845: 3
- top\_categories.customer\_id.CUST\_047805: 3

## Categorical - Metrics

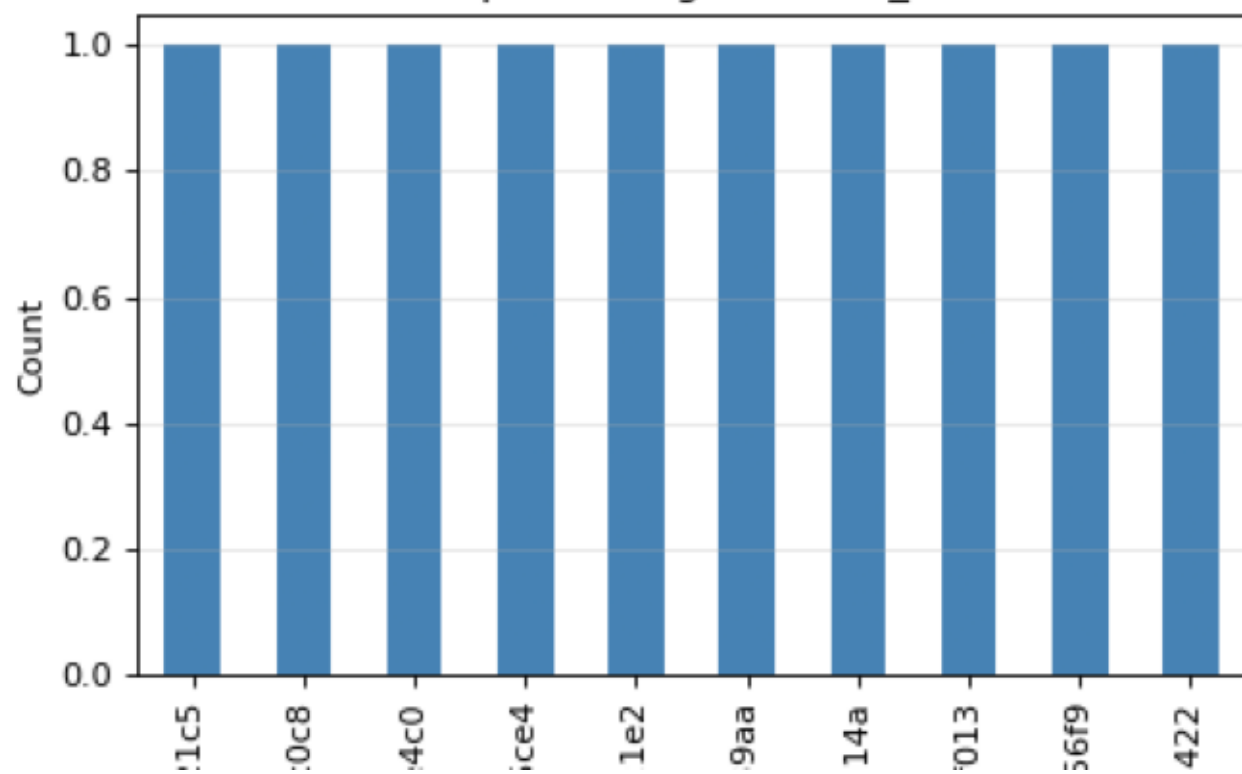
- top\_categories.customer\_id.CUST\_018477: 3
- top\_categories.customer\_id.CUST\_006697: 3
- top\_categories.customer\_id.CUST\_034620: 3
- top\_categories.customer\_id.CUST\_000258: 3

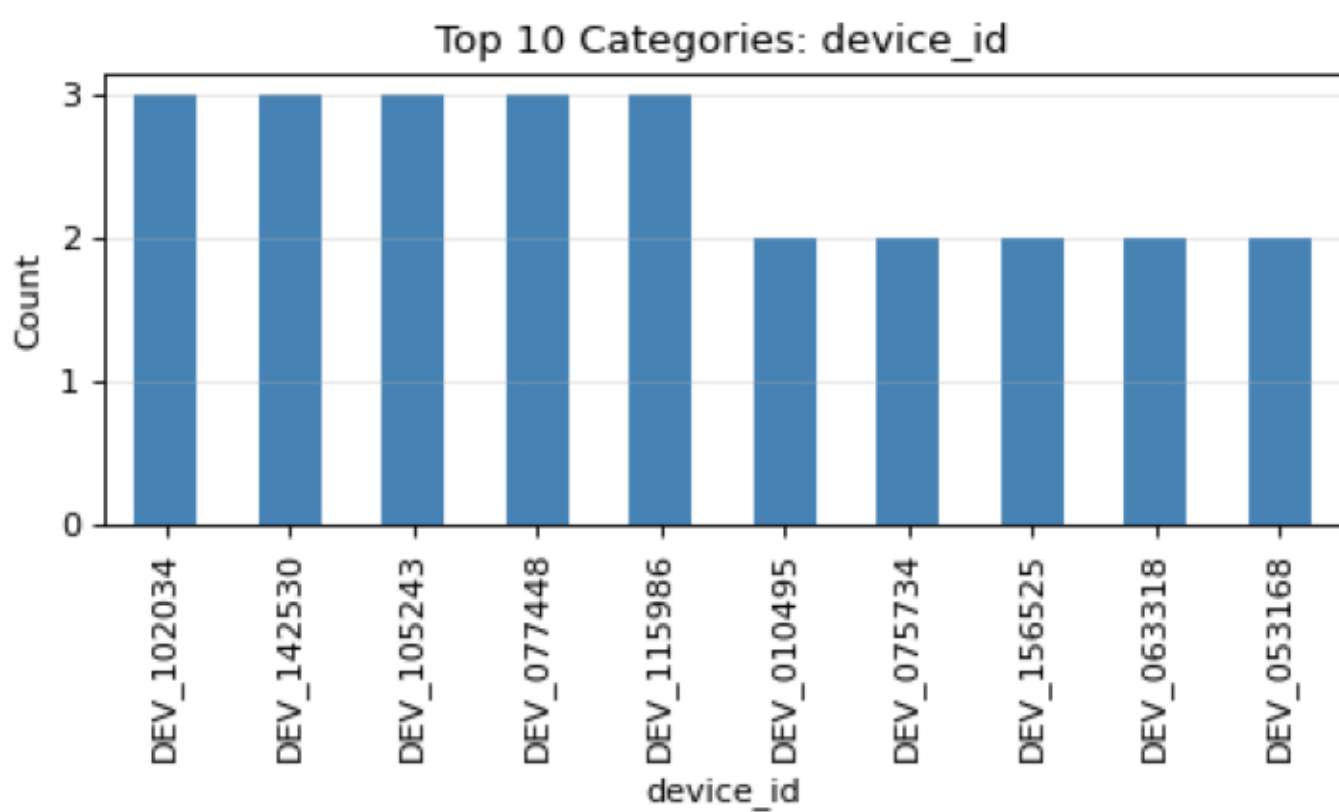


## Categorical - Explanation

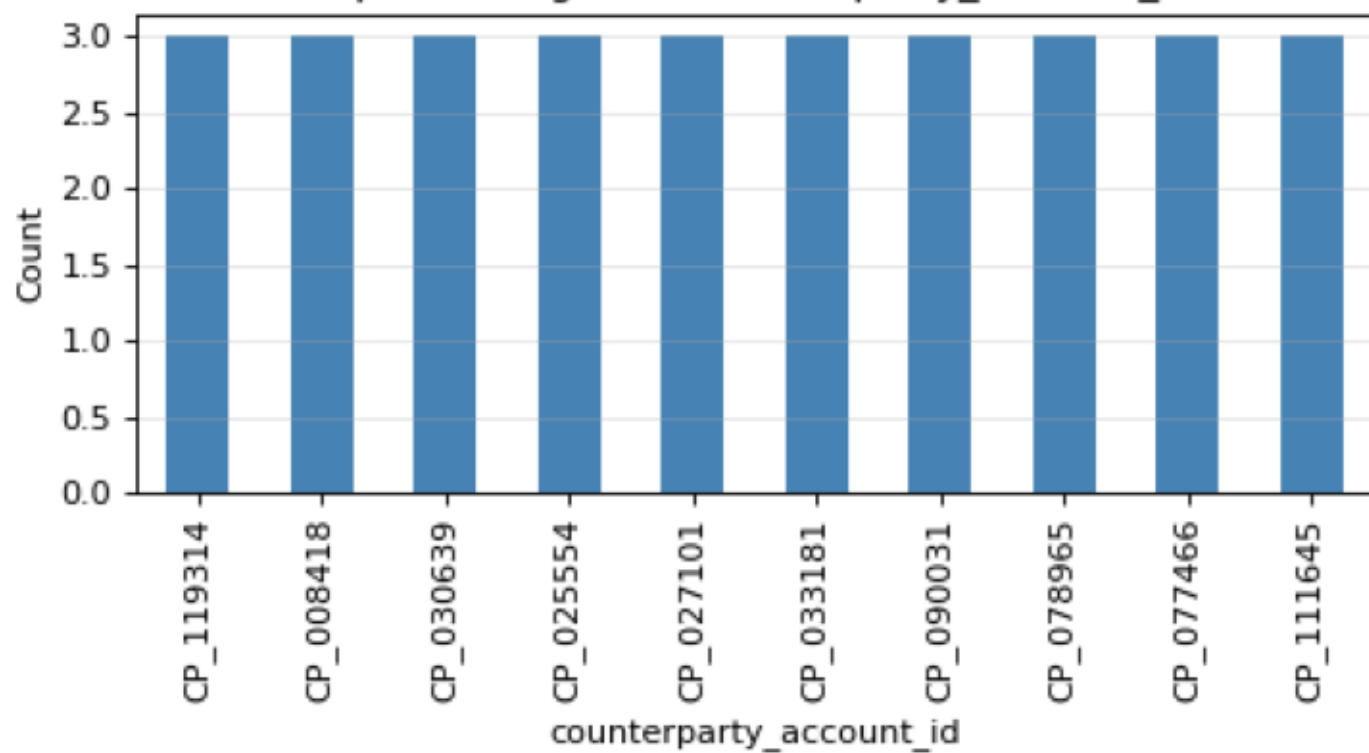
- Categorical columns analyzed (top 5 by unique count): ['txn\_id', 'device\_id', 'counterparty\_account\_id',
- 'account\_id', 'customer\_id'].

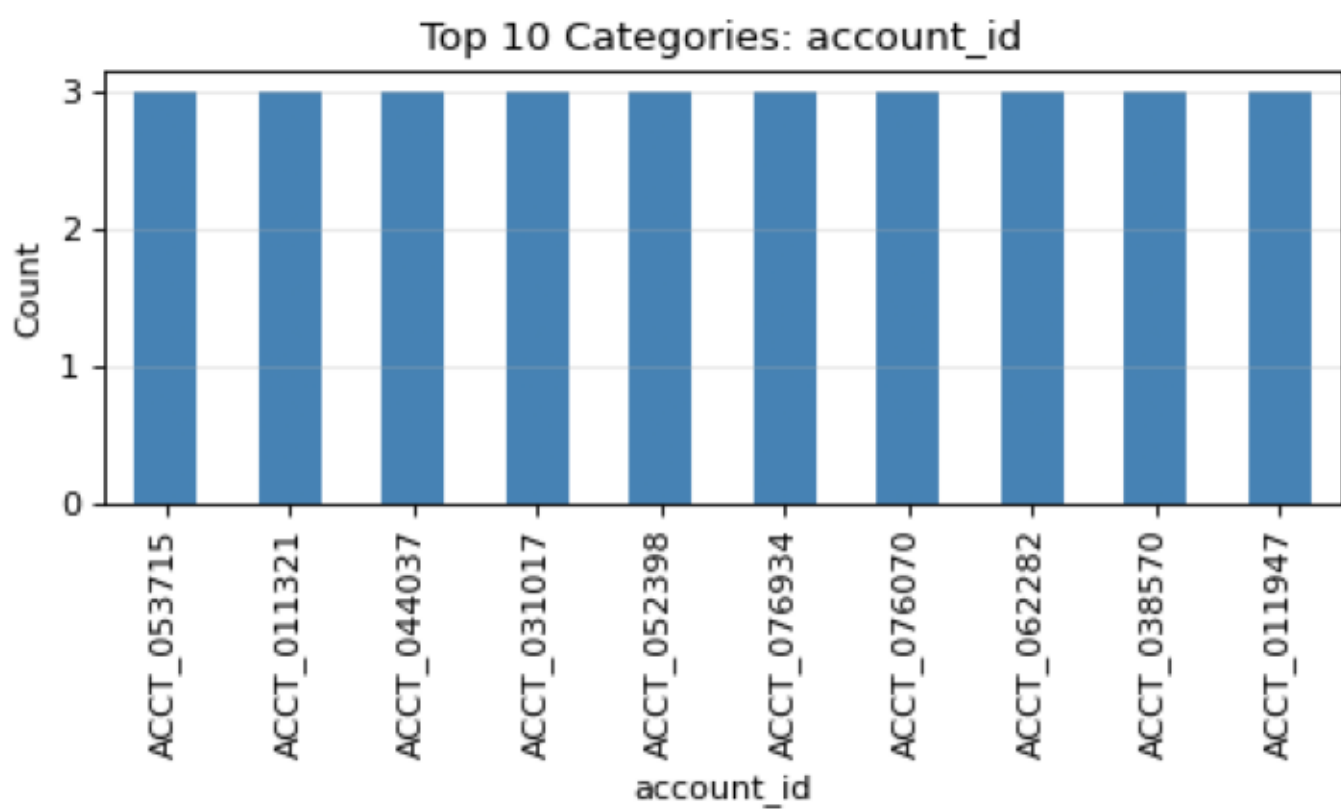
Top 10 Categories: txn\_id



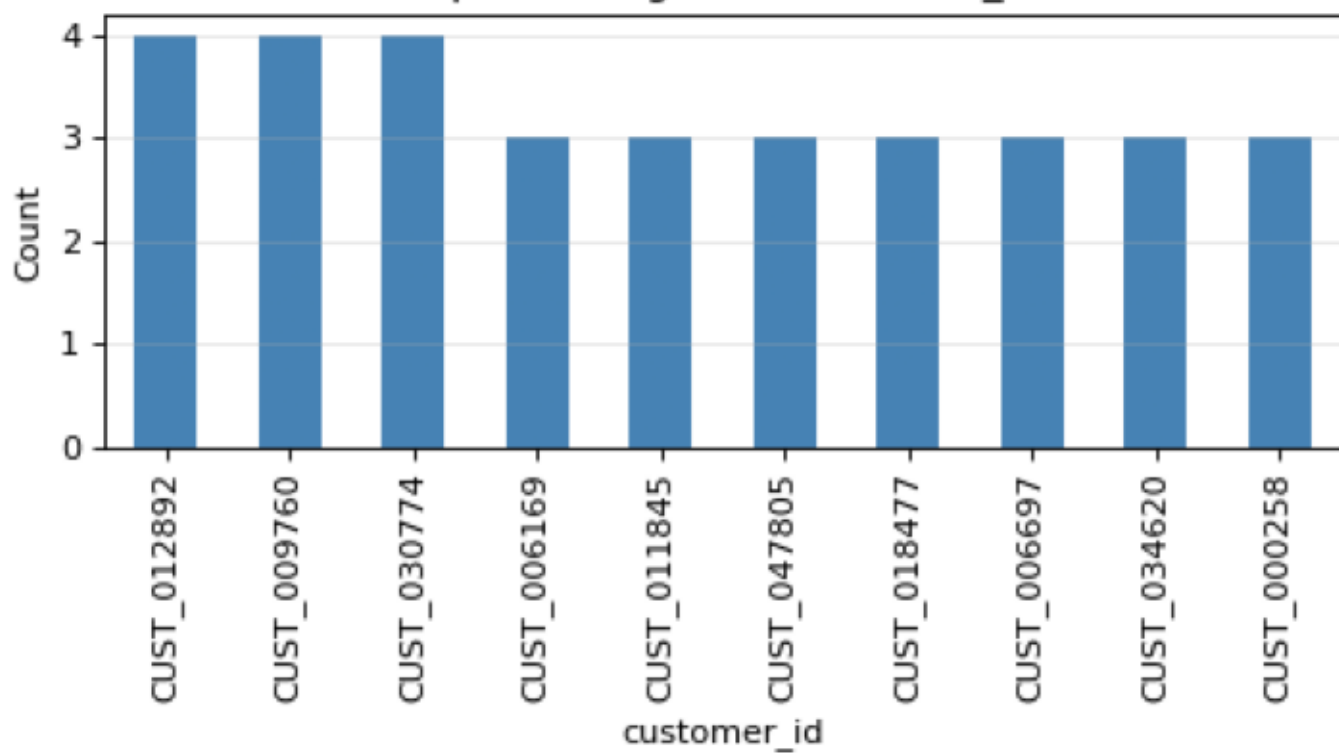


Top 10 Categories: counterparty\_account\_id





Top 10 Categories: customer\_id



## Correlation - Metrics

- correlation.txn\_amount.txn\_amount: 1.0
- correlation.txn\_amount.account\_age\_days: -0.0047
- correlation.txn\_amount.kyc\_risk\_score: 0.061
- correlation.txn\_amount.num\_txn\_24h: 0.1251
- correlation.txn\_amount.avg\_amount\_7d: 0.0181
- correlation.txn\_amount.is\_pep: 0.0291
- correlation.txn\_amount.sanctions\_match: 0.0103
- correlation.txn\_amount.is\_cross\_border: -0.0099
- correlation.txn\_amount.is\_fintech\_rail: -0.0001
- correlation.txn\_amount.origin\_country\_code: 0.0243
- correlation.txn\_amount.destination\_country\_code: 0.022
- correlation.txn\_amount.ip\_country\_code: -0.0066
- correlation.txn\_amount.currency\_code: 0.0223
- correlation.txn\_amount.txn\_channel\_code: -0.0083
- correlation.txn\_amount.payment\_rail\_code: 0.0001
- correlation.txn\_amount.txn\_type\_code: 0.0196
- correlation.txn\_amount.merchant\_category\_code: -0.0039
- correlation.txn\_amount.device\_type\_code: -0.0073
- correlation.txn\_amount.is\_suspicious: 0.085
- correlation.account\_age\_days.txn\_amount: -0.0047
- correlation.account\_age\_days.account\_age\_days: 1.0
- correlation.account\_age\_days.kyc\_risk\_score: 0.0008
- correlation.account\_age\_days.num\_txn\_24h: 0.0003
- correlation.account\_age\_days.avg\_amount\_7d: -0.0153
- correlation.account\_age\_days.is\_pep: -0.0055
- correlation.account\_age\_days.sanctions\_match: 0.0088
- correlation.account\_age\_days.is\_cross\_border: -0.0062
- correlation.account\_age\_days.is\_fintech\_rail: 0.014
- correlation.account\_age\_days.origin\_country\_code: 0.0056
- correlation.account\_age\_days.destination\_country\_code: -0.002
- correlation.account\_age\_days.ip\_country\_code: -0.0192
- correlation.account\_age\_days.currency\_code: -0.0013
- correlation.account\_age\_days.txn\_channel\_code: 0.0091
- correlation.account\_age\_days.payment\_rail\_code: 0.0091
- correlation.account\_age\_days.txn\_type\_code: -0.0005
- correlation.account\_age\_days.merchant\_category\_code: -0.0103
- correlation.account\_age\_days.device\_type\_code: 0.0005
- correlation.account\_age\_days.is\_suspicious: -0.0028
- correlation.kyc\_risk\_score.txn\_amount: 0.061
- correlation.kyc\_risk\_score.account\_age\_days: 0.0008
- correlation.kyc\_risk\_score.kyc\_risk\_score: 1.0
- correlation.kyc\_risk\_score.num\_txn\_24h: 0.3092
- correlation.kyc\_risk\_score.avg\_amount\_7d: 0.0026
- correlation.kyc\_risk\_score.is\_pep: 0.1997
- correlation.kyc\_risk\_score.sanctions\_match: 0.17
- correlation.kyc\_risk\_score.is\_cross\_border: -0.0014

## Correlation - Metrics

- correlation.kyc\_risk\_score.is\_fintech\_rail: 0.0653
- correlation.kyc\_risk\_score.origin\_country\_code: 0.0637
- correlation.kyc\_risk\_score.destination\_country\_code: 0.0481
- correlation.kyc\_risk\_score.ip\_country\_code: 0.0024
- correlation.kyc\_risk\_score.currency\_code: 0.0196
- correlation.kyc\_risk\_score.txn\_channel\_code: 0.0234
- correlation.kyc\_risk\_score.payment\_rail\_code: 0.0659
- correlation.kyc\_risk\_score.txn\_type\_code: 0.0011
- correlation.kyc\_risk\_score.merchant\_category\_code: 0.0066
- correlation.kyc\_risk\_score.device\_type\_code: -0.0029
- correlation.kyc\_risk\_score.is\_suspicious: 0.347
- correlation.num\_txn\_24h.txn\_amount: 0.1251
- correlation.num\_txn\_24h.account\_age\_days: 0.0003
- correlation.num\_txn\_24h.kyc\_risk\_score: 0.3092
- correlation.num\_txn\_24h.num\_txn\_24h: 1.0
- correlation.num\_txn\_24h.avg\_amount\_7d: -0.0031
- correlation.num\_txn\_24h.is\_pep: 0.3485
- correlation.num\_txn\_24h.sanctions\_match: 0.2415
- correlation.num\_txn\_24h.is\_cross\_border: -0.0042
- correlation.num\_txn\_24h.is\_fintech\_rail: 0.096
- correlation.num\_txn\_24h.origin\_country\_code: 0.0865
- correlation.num\_txn\_24h.destination\_country\_code: 0.0922
- correlation.num\_txn\_24h.ip\_country\_code: -0.0035
- correlation.num\_txn\_24h.currency\_code: 0.0162
- correlation.num\_txn\_24h.txn\_channel\_code: 0.0284
- correlation.num\_txn\_24h.payment\_rail\_code: 0.1025
- correlation.num\_txn\_24h.txn\_type\_code: 0.0032
- correlation.num\_txn\_24h.merchant\_category\_code: 0.0174
- correlation.num\_txn\_24h.device\_type\_code: -0.0075
- correlation.num\_txn\_24h.is\_suspicious: 0.5432
- correlation.avg\_amount\_7d.txn\_amount: 0.0181
- correlation.avg\_amount\_7d.account\_age\_days: -0.0153
- correlation.avg\_amount\_7d.kyc\_risk\_score: 0.0026
- correlation.avg\_amount\_7d.num\_txn\_24h: -0.0031
- correlation.avg\_amount\_7d.avg\_amount\_7d: 1.0
- correlation.avg\_amount\_7d.is\_pep: -0.0031
- correlation.avg\_amount\_7d.sanctions\_match: -0.0138
- correlation.avg\_amount\_7d.is\_cross\_border: 0.0037
- correlation.avg\_amount\_7d.is\_fintech\_rail: 0.0093
- correlation.avg\_amount\_7d.origin\_country\_code: -0.0104
- correlation.avg\_amount\_7d.destination\_country\_code: 0.0111
- correlation.avg\_amount\_7d.ip\_country\_code: 0.0038
- correlation.avg\_amount\_7d.currency\_code: 0.0134
- correlation.avg\_amount\_7d.txn\_channel\_code: 0.0141
- correlation.avg\_amount\_7d.payment\_rail\_code: 0.0105
- correlation.avg\_amount\_7d.txn\_type\_code: 0.0063



## Correlation - Metrics

- correlation.avg\_amount\_7d.merchant\_category\_code: 0.0014
- correlation.avg\_amount\_7d.device\_type\_code: 0.0082
- correlation.avg\_amount\_7d.is\_suspicious: -0.0038
- correlation.is\_pep.txn\_amount: 0.0291
- correlation.is\_pep.account\_age\_days: -0.0055
- correlation.is\_pep.kyc\_risk\_score: 0.1997
- correlation.is\_pep.num\_txn\_24h: 0.3485
- correlation.is\_pep.avg\_amount\_7d: -0.0031
- correlation.is\_pep.is\_pep: 1.0
- correlation.is\_pep.sanctions\_match: 0.1893
- correlation.is\_pep.is\_cross\_border: 0.0006
- correlation.is\_pep.is\_fintech\_rail: 0.0772
- correlation.is\_pep.origin\_country\_code: 0.0569
- correlation.is\_pep.destination\_country\_code: 0.0497
- correlation.is\_pep.ip\_country\_code: 0.0076
- correlation.is\_pep.currency\_code: -0.0058
- correlation.is\_pep.txn\_channel\_code: 0.0344
- correlation.is\_pep.payment\_rail\_code: 0.0682
- correlation.is\_pep.txn\_type\_code: 0.0103
- correlation.is\_pep.merchant\_category\_code: 0.008
- correlation.is\_pep.device\_type\_code: 0.014
- correlation.is\_pep.is\_suspicious: 0.4036
- correlation.sanctions\_match.txn\_amount: 0.0103
- correlation.sanctions\_match.account\_age\_days: 0.0088
- correlation.sanctions\_match.kyc\_risk\_score: 0.17
- correlation.sanctions\_match.num\_txn\_24h: 0.2415
- correlation.sanctions\_match.avg\_amount\_7d: -0.0138
- correlation.sanctions\_match.is\_pep: 0.1893
- correlation.sanctions\_match.sanctions\_match: 1.0
- correlation.sanctions\_match.is\_cross\_border: -0.0008
- correlation.sanctions\_match.is\_fintech\_rail: 0.0612
- correlation.sanctions\_match.origin\_country\_code: 0.0377
- correlation.sanctions\_match.destination\_country\_code: 0.0555
- correlation.sanctions\_match.ip\_country\_code: 0.003
- correlation.sanctions\_match.currency\_code: 0.0078
- correlation.sanctions\_match.txn\_channel\_code: 0.0216
- correlation.sanctions\_match.payment\_rail\_code: 0.0682
- correlation.sanctions\_match.txn\_type\_code: -0.0073
- correlation.sanctions\_match.merchant\_category\_code: -0.0027
- correlation.sanctions\_match.device\_type\_code: -0.0256
- correlation.sanctions\_match.is\_suspicious: 0.3118
- correlation.is\_cross\_border.txn\_amount: -0.0099
- correlation.is\_cross\_border.account\_age\_days: -0.0062
- correlation.is\_cross\_border.kyc\_risk\_score: -0.0014
- correlation.is\_cross\_border.num\_txn\_24h: -0.0042
- correlation.is\_cross\_border.avg\_amount\_7d: 0.0037

## Correlation - Metrics

- correlation.is\_cross\_border.is\_pep: 0.0006
- correlation.is\_cross\_border.sanctions\_match: -0.0008
- correlation.is\_cross\_border.is\_cross\_border: 1.0
- correlation.is\_cross\_border.is\_fintech\_rail: -0.0113
- correlation.is\_cross\_border.origin\_country\_code: 0.2201
- correlation.is\_cross\_border.destination\_country\_code: 0.2208
- correlation.is\_cross\_border.ip\_country\_code: -0.0001
- correlation.is\_cross\_border.currency\_code: -0.2399
- correlation.is\_cross\_border.txn\_channel\_code: 0.0128
- correlation.is\_cross\_border.payment\_rail\_code: -0.0107
- correlation.is\_cross\_border.txn\_type\_code: 0.0097
- correlation.is\_cross\_border.merchant\_category\_code: -0.0082
- correlation.is\_cross\_border.device\_type\_code: -0.0099
- correlation.is\_cross\_border.is\_suspicious: -0.0078
- correlation.is\_fintech\_rail.txn\_amount: -0.0001
- correlation.is\_fintech\_rail.account\_age\_days: 0.014
- correlation.is\_fintech\_rail.kyc\_risk\_score: 0.0653
- correlation.is\_fintech\_rail.num\_txn\_24h: 0.096
- correlation.is\_fintech\_rail.avg\_amount\_7d: 0.0093
- correlation.is\_fintech\_rail.is\_pep: 0.0772
- correlation.is\_fintech\_rail.sanctions\_match: 0.0612
- correlation.is\_fintech\_rail.is\_cross\_border: -0.0113
- correlation.is\_fintech\_rail.is\_fintech\_rail: 1.0
- correlation.is\_fintech\_rail.origin\_country\_code: 0.0321
- correlation.is\_fintech\_rail.destination\_country\_code: 0.0166
- correlation.is\_fintech\_rail.ip\_country\_code: -0.0067
- correlation.is\_fintech\_rail.currency\_code: -0.0067
- correlation.is\_fintech\_rail.txn\_channel\_code: 0.0216
- correlation.is\_fintech\_rail.payment\_rail\_code: 0.8657
- correlation.is\_fintech\_rail.txn\_type\_code: 0.0029
- correlation.is\_fintech\_rail.merchant\_category\_code: -0.0019
- correlation.is\_fintech\_rail.device\_type\_code: 0.0164
- correlation.is\_fintech\_rail.is\_suspicious: 0.1175
- correlation.origin\_country\_code.txn\_amount: 0.0243
- correlation.origin\_country\_code.account\_age\_days: 0.0056
- correlation.origin\_country\_code.kyc\_risk\_score: 0.0637
- correlation.origin\_country\_code.num\_txn\_24h: 0.0865
- correlation.origin\_country\_code.avg\_amount\_7d: -0.0104
- correlation.origin\_country\_code.is\_pep: 0.0569
- correlation.origin\_country\_code.sanctions\_match: 0.0377
- correlation.origin\_country\_code.is\_cross\_border: 0.2201
- correlation.origin\_country\_code.is\_fintech\_rail: 0.0321
- correlation.origin\_country\_code.origin\_country\_code: 1.0
- correlation.origin\_country\_code.destination\_country\_code: 0.0189
- correlation.origin\_country\_code.ip\_country\_code: 0.0066
- correlation.origin\_country\_code.currency\_code: -0.3577

## Correlation - Metrics

- correlation.origin\_country\_code.txn\_channel\_code: 0.0005
- correlation.origin\_country\_code.payment\_rail\_code: 0.0273
- correlation.origin\_country\_code.txn\_type\_code: 0.0089
- correlation.origin\_country\_code.merchant\_category\_code: -0.0089
- correlation.origin\_country\_code.device\_type\_code: -0.0058
- correlation.origin\_country\_code.is\_suspicious: 0.1027
- correlation.destination\_country\_code.txn\_amount: 0.022
- correlation.destination\_country\_code.account\_age\_days: -0.002
- correlation.destination\_country\_code.kyc\_risk\_score: 0.0481
- correlation.destination\_country\_code.num\_txn\_24h: 0.0922
- correlation.destination\_country\_code.avg\_amount\_7d: 0.0111
- correlation.destination\_country\_code.is\_pep: 0.0497
- correlation.destination\_country\_code.sanctions\_match: 0.0555
- correlation.destination\_country\_code.is\_cross\_border: 0.2208
- correlation.destination\_country\_code.is\_fintech\_rail: 0.0166
- correlation.destination\_country\_code.origin\_country\_code: 0.0189
- correlation.destination\_country\_code.destination\_country\_code: 1.0
- correlation.destination\_country\_code.ip\_country\_code: -0.0056
- correlation.destination\_country\_code.currency\_code: 0.0023
- correlation.destination\_country\_code.txn\_channel\_code: 0.0097
- correlation.destination\_country\_code.payment\_rail\_code: 0.016
- correlation.destination\_country\_code.txn\_type\_code: 0.0067
- correlation.destination\_country\_code.merchant\_category\_code: -0.0104
- correlation.destination\_country\_code.device\_type\_code: -0.0164
- correlation.destination\_country\_code.is\_suspicious: 0.1092
- correlation.ip\_country\_code.txn\_amount: -0.0066
- correlation.ip\_country\_code.account\_age\_days: -0.0192
- correlation.ip\_country\_code.kyc\_risk\_score: 0.0024
- correlation.ip\_country\_code.num\_txn\_24h: -0.0035
- correlation.ip\_country\_code.avg\_amount\_7d: 0.0038
- correlation.ip\_country\_code.is\_pep: 0.0076
- correlation.ip\_country\_code.sanctions\_match: 0.003
- correlation.ip\_country\_code.is\_cross\_border: -0.0001
- correlation.ip\_country\_code.is\_fintech\_rail: -0.0067
- correlation.ip\_country\_code.origin\_country\_code: 0.0066
- correlation.ip\_country\_code.destination\_country\_code: -0.0056
- correlation.ip\_country\_code.ip\_country\_code: 1.0
- correlation.ip\_country\_code.currency\_code: 0.0009
- correlation.ip\_country\_code.txn\_channel\_code: -0.0156
- correlation.ip\_country\_code.payment\_rail\_code: -0.0124
- correlation.ip\_country\_code.txn\_type\_code: -0.0048
- correlation.ip\_country\_code.merchant\_category\_code: -0.0049
- correlation.ip\_country\_code.device\_type\_code: -0.0118
- correlation.ip\_country\_code.is\_suspicious: 0.0009
- correlation.currency\_code.txn\_amount: 0.0223
- correlation.currency\_code.account\_age\_days: -0.0013

## Correlation - Metrics

- correlation.currency\_code.kyc\_risk\_score: 0.0196
- correlation.currency\_code.num\_txn\_24h: 0.0162
- correlation.currency\_code.avg\_amount\_7d: 0.0134
- correlation.currency\_code.is\_pep: -0.0058
- correlation.currency\_code.sanctions\_match: 0.0078
- correlation.currency\_code.is\_cross\_border: -0.2399
- correlation.currency\_code.is\_fintech\_rail: -0.0067
- correlation.currency\_code.origin\_country\_code: -0.3577
- correlation.currency\_code.destination\_country\_code: 0.0023
- correlation.currency\_code.ip\_country\_code: 0.0009
- correlation.currency\_code.currency\_code: 1.0
- correlation.currency\_code.txn\_channel\_code: -0.0069
- correlation.currency\_code.payment\_rail\_code: -0.0004
- correlation.currency\_code.txn\_type\_code: 0.0009
- correlation.currency\_code.merchant\_category\_code: 0.0001
- correlation.currency\_code.device\_type\_code: 0.0112
- correlation.currency\_code.is\_suspicious: -0.005
- correlation.txn\_channel\_code.txn\_amount: -0.0083
- correlation.txn\_channel\_code.account\_age\_days: 0.0091
- correlation.txn\_channel\_code.kyc\_risk\_score: 0.0234
- correlation.txn\_channel\_code.num\_txn\_24h: 0.0284
- correlation.txn\_channel\_code.avg\_amount\_7d: 0.0141
- correlation.txn\_channel\_code.is\_pep: 0.0344
- correlation.txn\_channel\_code.sanctions\_match: 0.0216
- correlation.txn\_channel\_code.is\_cross\_border: 0.0128
- correlation.txn\_channel\_code.is\_fintech\_rail: 0.0216
- correlation.txn\_channel\_code.origin\_country\_code: 0.0005
- correlation.txn\_channel\_code.destination\_country\_code: 0.0097
- correlation.txn\_channel\_code.ip\_country\_code: -0.0156
- correlation.txn\_channel\_code.currency\_code: -0.0069
- correlation.txn\_channel\_code.txn\_channel\_code: 1.0
- correlation.txn\_channel\_code.payment\_rail\_code: 0.0138
- correlation.txn\_channel\_code.txn\_type\_code: -0.0044
- correlation.txn\_channel\_code.merchant\_category\_code: -0.0019
- correlation.txn\_channel\_code.device\_type\_code: -0.0014
- correlation.txn\_channel\_code.is\_suspicious: 0.0463
- correlation.payment\_rail\_code.txn\_amount: 0.0001
- correlation.payment\_rail\_code.account\_age\_days: 0.0091
- correlation.payment\_rail\_code.kyc\_risk\_score: 0.0659
- correlation.payment\_rail\_code.num\_txn\_24h: 0.1025
- correlation.payment\_rail\_code.avg\_amount\_7d: 0.0105
- correlation.payment\_rail\_code.is\_pep: 0.0682
- correlation.payment\_rail\_code.sanctions\_match: 0.0682
- correlation.payment\_rail\_code.is\_cross\_border: -0.0107
- correlation.payment\_rail\_code.is\_fintech\_rail: 0.8657
- correlation.payment\_rail\_code.origin\_country\_code: 0.0273

## Correlation - Metrics

- correlation.payment\_rail\_code.destination\_country\_code: 0.016
- correlation.payment\_rail\_code.ip\_country\_code: -0.0124
- correlation.payment\_rail\_code.currency\_code: -0.0004
- correlation.payment\_rail\_code.txn\_channel\_code: 0.0138
- correlation.payment\_rail\_code.payment\_rail\_code: 1.0
- correlation.payment\_rail\_code.txn\_type\_code: 0.0078
- correlation.payment\_rail\_code.merchant\_category\_code: 0.0052
- correlation.payment\_rail\_code.device\_type\_code: 0.0023
- correlation.payment\_rail\_code.is\_suspicious: 0.1146
- correlation.txn\_type\_code.txn\_amount: 0.0196
- correlation.txn\_type\_code.account\_age\_days: -0.0005
- correlation.txn\_type\_code.kyc\_risk\_score: 0.0011
- correlation.txn\_type\_code.num\_txn\_24h: 0.0032
- correlation.txn\_type\_code.avg\_amount\_7d: 0.0063
- correlation.txn\_type\_code.is\_pep: 0.0103
- correlation.txn\_type\_code.sanctions\_match: -0.0073
- correlation.txn\_type\_code.is\_cross\_border: 0.0097
- correlation.txn\_type\_code.is\_fintech\_rail: 0.0029
- correlation.txn\_type\_code.origin\_country\_code: 0.0089
- correlation.txn\_type\_code.destination\_country\_code: 0.0067
- correlation.txn\_type\_code.ip\_country\_code: -0.0048
- correlation.txn\_type\_code.currency\_code: 0.0009
- correlation.txn\_type\_code.txn\_channel\_code: -0.0044
- correlation.txn\_type\_code.payment\_rail\_code: 0.0078
- correlation.txn\_type\_code.txn\_type\_code: 1.0
- correlation.txn\_type\_code.merchant\_category\_code: 0.0006
- correlation.txn\_type\_code.device\_type\_code: -0.0003
- correlation.txn\_type\_code.is\_suspicious: 0.0126
- correlation.merchant\_category\_code.txn\_amount: -0.0039
- correlation.merchant\_category\_code.account\_age\_days: -0.0103
- correlation.merchant\_category\_code.kyc\_risk\_score: 0.0066
- correlation.merchant\_category\_code.num\_txn\_24h: 0.0174
- correlation.merchant\_category\_code.avg\_amount\_7d: 0.0014
- correlation.merchant\_category\_code.is\_pep: 0.008
- correlation.merchant\_category\_code.sanctions\_match: -0.0027
- correlation.merchant\_category\_code.is\_cross\_border: -0.0082
- correlation.merchant\_category\_code.is\_fintech\_rail: -0.0019
- correlation.merchant\_category\_code.origin\_country\_code: -0.0089
- correlation.merchant\_category\_code.destination\_country\_code: -0.0104
- correlation.merchant\_category\_code.ip\_country\_code: -0.0049
- correlation.merchant\_category\_code.currency\_code: 0.0001
- correlation.merchant\_category\_code.txn\_channel\_code: -0.0019
- correlation.merchant\_category\_code.payment\_rail\_code: 0.0052
- correlation.merchant\_category\_code.txn\_type\_code: 0.0006
- correlation.merchant\_category\_code.merchant\_category\_code: 1.0
- correlation.merchant\_category\_code.device\_type\_code: -0.0023

## Correlation - Metrics

- correlation.merchant\_category\_code.is\_suspicious: 0.0137
- correlation.device\_type\_code.txn\_amount: -0.0073
- correlation.device\_type\_code.account\_age\_days: 0.0005
- correlation.device\_type\_code.kyc\_risk\_score: -0.0029
- correlation.device\_type\_code.num\_txn\_24h: -0.0075
- correlation.device\_type\_code.avg\_amount\_7d: 0.0082
- correlation.device\_type\_code.is\_pep: 0.014
- correlation.device\_type\_code.sanctions\_match: -0.0256
- correlation.device\_type\_code.is\_cross\_border: -0.0099
- correlation.device\_type\_code.is\_fintech\_rail: 0.0164
- correlation.device\_type\_code.origin\_country\_code: -0.0058
- correlation.device\_type\_code.destination\_country\_code: -0.0164
- correlation.device\_type\_code.ip\_country\_code: -0.0118
- correlation.device\_type\_code.currency\_code: 0.0112
- correlation.device\_type\_code.txn\_channel\_code: -0.0014
- correlation.device\_type\_code.payment\_rail\_code: 0.0023
- correlation.device\_type\_code.txn\_type\_code: -0.0003
- correlation.device\_type\_code.merchant\_category\_code: -0.0023
- correlation.device\_type\_code.device\_type\_code: 1.0
- correlation.device\_type\_code.is\_suspicious: -0.0006
- correlation.is\_suspicious.txn\_amount: 0.085
- correlation.is\_suspicious.account\_age\_days: -0.0028
- correlation.is\_suspicious.kyc\_risk\_score: 0.347
- correlation.is\_suspicious.num\_txn\_24h: 0.5432
- correlation.is\_suspicious.avg\_amount\_7d: -0.0038
- correlation.is\_suspicious.is\_pep: 0.4036
- correlation.is\_suspicious.sanctions\_match: 0.3118
- correlation.is\_suspicious.is\_cross\_border: -0.0078
- correlation.is\_suspicious.is\_fintech\_rail: 0.1175
- correlation.is\_suspicious.origin\_country\_code: 0.1027
- correlation.is\_suspicious.destination\_country\_code: 0.1092
- correlation.is\_suspicious.ip\_country\_code: 0.0009
- correlation.is\_suspicious.currency\_code: -0.005
- correlation.is\_suspicious.txn\_channel\_code: 0.0463
- correlation.is\_suspicious.payment\_rail\_code: 0.1146
- correlation.is\_suspicious.txn\_type\_code: 0.0126
- correlation.is\_suspicious.merchant\_category\_code: 0.0137
- correlation.is\_suspicious.device\_type\_code: -0.0006
- correlation.is\_suspicious.is\_suspicious: 1.0
- target\_correlation.is\_suspicious: 1.0
- target\_correlation.num\_txn\_24h: 0.5432
- target\_correlation.is\_pep: 0.4036
- target\_correlation.kyc\_risk\_score: 0.347
- target\_correlation.sanctions\_match: 0.3118
- target\_correlation.is\_fintech\_rail: 0.1175
- target\_correlation.payment\_rail\_code: 0.1146

## Correlation - Metrics

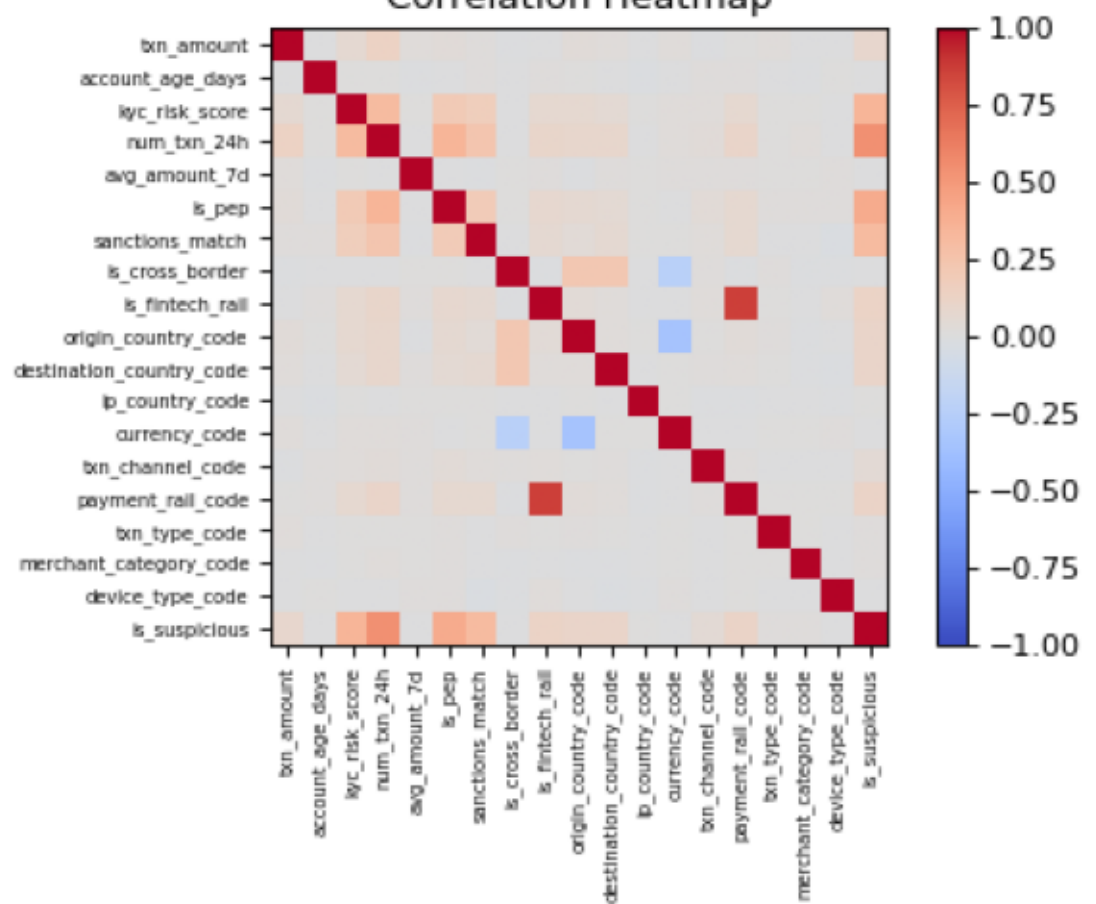
- target\_correlation.destination\_country\_code: 0.1092
- target\_correlation.origin\_country\_code: 0.1027
- target\_correlation.txn\_amount: 0.085
- target\_correlation.txn\_channel\_code: 0.0463
- target\_correlation.merchant\_category\_code: 0.0137
- target\_correlation.txn\_type\_code: 0.0126
- target\_correlation.ip\_country\_code: 0.0009
- target\_correlation.device\_type\_code: -0.0006
- target\_correlation.account\_age\_days: -0.0028
- target\_correlation.avg\_amount\_7d: -0.0038
- target\_correlation.currency\_code: -0.005
- target\_correlation.is\_cross\_border: -0.0078

## Correlation - Explanation

- Correlation heatmap shows linear relationships among numeric features.
- Top correlated features with target 'is\_suspicious': ['is\_suspicious', 'num\_txn\_24h', 'is\_pep', 'kyc\_risk\_score', 'sanctions\_match'].



### Correlation Heatmap



## Outliers - Metrics

- outlier\_ratio.txn\_amount: 0.1313
- outlier\_ratio.account\_age\_days: 0.0
- outlier\_ratio.kyc\_risk\_score: 0.0189
- outlier\_ratio.num\_txn\_24h: 0.03
- outlier\_ratio.avg\_amount\_7d: 0.068
- outlier\_ratio.is\_pep: 0.0
- outlier\_ratio.sanctions\_match: 0.0
- outlier\_ratio.is\_cross\_border: 0.0
- outlier\_ratio.is\_fintech\_rail: 0.0
- outlier\_ratio.origin\_country\_code: 0.0
- outlier\_ratio.destination\_country\_code: 0.0
- outlier\_ratio.ip\_country\_code: 0.0
- outlier\_ratio.currency\_code: 0.0
- outlier\_ratio.txn\_channel\_code: 0.0
- outlier\_ratio.payment\_rail\_code: 0.0
- outlier\_ratio.txn\_type\_code: 0.0
- outlier\_ratio.merchant\_category\_code: 0.0
- outlier\_ratio.device\_type\_code: 0.0
- outlier\_ratio.is\_suspicious: 0.0

## Outliers - Explanation

- Top outlier ratios: [('txn\_amount', 0.1313), ('avg\_amount\_7d', 0.068), ('num\_txn\_24h', 0.03),
- ('kyc\_risk\_score', 0.0189), ('account\_age\_days', 0.0), ('is\_pep', 0.0), ('sanctions\_match', 0.0),
- ('is\_cross\_border', 0.0), ('is\_fintech\_rail', 0.0), ('origin\_country\_code', 0.0)].

Top Outlier Ratios

