

DATA ANALYST

Tech Challenger

Anderson Cruz

28.10.2022



SWISSBORG – DATA ANALYST RESOURCES



Google Drive: [Link](#)



Visual Studio: [Link](#)



Power BI: [Link](#)

Data Analyst Tech Challenge

Anderson Cruz | Edinburg-UK | [Linkedin](#) | October 27th, 2022

```
[66] #install pandassql  
      #pip install -U pandassql  
      ✓ 0.2s
```

```
[67] import pandas as pd  
      import matplotlib.pyplot as plt  
      import seaborn as sns  
      from datetime import date  
  
      #read csv files  
      acquisition_cost = pd.read_csv(r'acquisition_cost_data.csv')  
      identity_data = pd.read_csv(r'identity_data.csv')  
      transaction_data = pd.read_csv(r'transaction_data.csv')  
      pd.set_option('float_format', '{:,.0f}'.format)
```

```
... c:\Users\ander\anaconda3\lib\site-packages\IPython\core\interactiv  
on import or set low_memory=False.  
      exec(code_obj, self.user_global_ns, self.user_ns)
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL JUPYTER

No problems have been detected in the workspace.



SWISSBORG – DATA ANALYST

DATASETS

user_identity table ([download here](#), ~159MB)

This table contains key events related to the registration/onboarding process of our users. If you have tried out the Swissborg app, you already know that users need to answer some questions and submit some documents to verify their identity. This table contains events related to these steps, starting from the initial phone registration until their account is verified. Note that the table contains events from users who started their registration between July 1 2021 and December 31 2021.

transaction_summary table ([download here](#), ~63MB)

This table contains daily aggregation of deposits/withdrawal amounts; exchange volume; yield subscriptions / redemptions; various fees that the user generated; and finally their [premium tier](#). It contains entries only from users who started their registration between July 1 2021 and December 31 2021.

acquisition_cost table ([download here](#), ~8.3MB)

This table contains the acquisition cost for each user who started their registration between July 1 2021 and December 31 2021.



We are diverse

Composed of individuals from more than 20 countries and many backgrounds. We believe embracing our differences makes us a better company.



We are different

We have a flat structure where every person is encouraged to share their ideas, knowledge and experience. We trust you to know what best suits you and your team.















We are passionate

SwissBorg is here to disrupt. We believe in an investment world where technology and finance merge to raise trust, inclusiveness and financial freedom.



SWISSBORG – DATA ANALYST

PREMIUM TIER

	 Standard	 Explorer	 Community	 Pioneer	 Generation	 Genesis
 Availability	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Closed
 Staking Period	0	1 year	1 year	1 year	1 year	1 year
 CHSB Staking	0	500	2,000	7,000	20,000	50,000
 Yield Boost Show rates	1X	1.25X	1.5X	1.75X	2X	2X
 Exchange Fees Show fees	1.0%	1.0%	0.75%	0.75%	0.5%	0–0.25%
 Thematics View details	2.0%	2.0%	1.5%	1.5%	1.0%	1.0%

Unlock unique benefits with Premium

Boost your yield and lower your fees for just 500 CHSB

[How to upgrade](#)



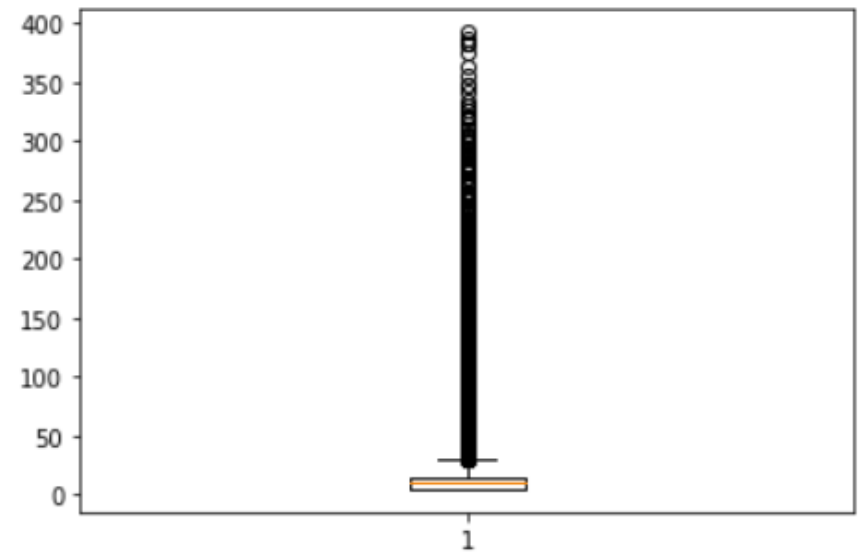
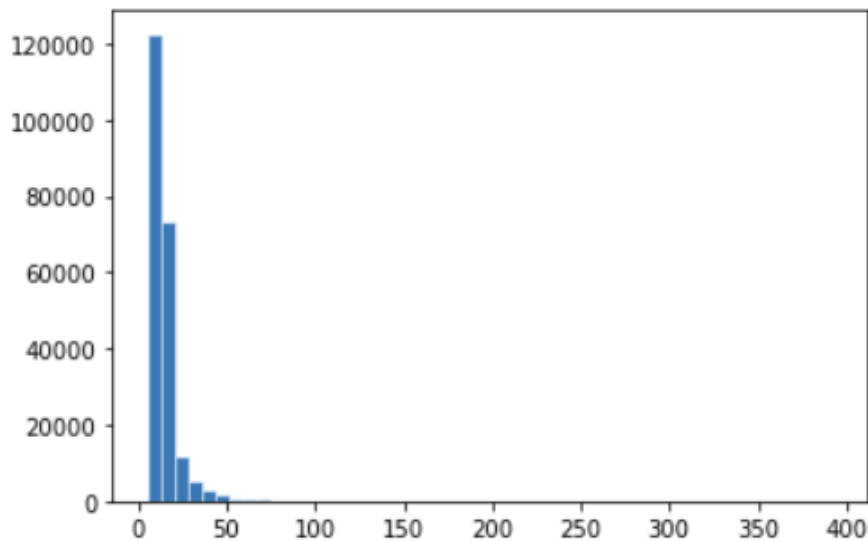


SWISSBORG – DATA ANALYST

ACQUISITION COST DATA

Total Users H2 2021: 219.734

acquisition_cost_usd	
count	219,734
mean	13
std	13
min	5
25%	5
50%	10
75%	15
max	393



- Concentrated between 5 – 15
- Few outliers from 15 - 393



SWISSBORG – DATA ANALYST

IDENTITY DATA

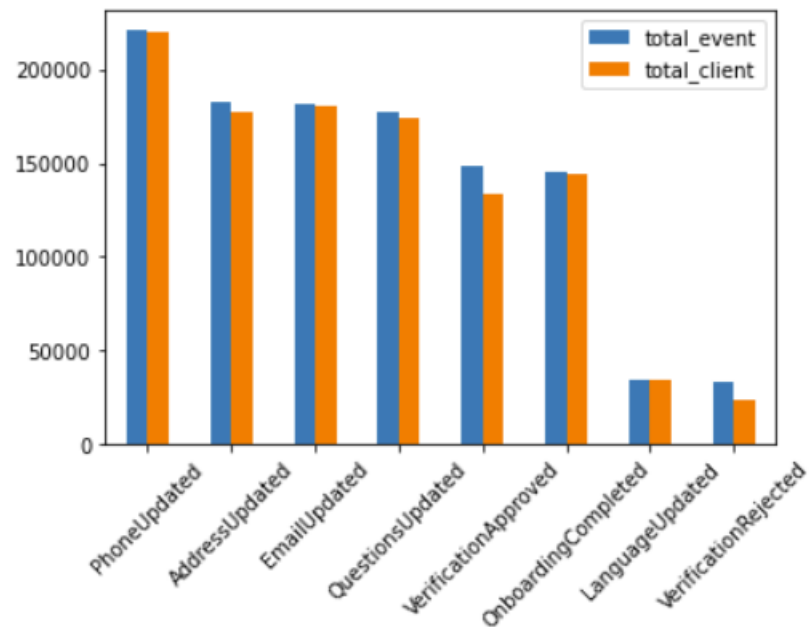
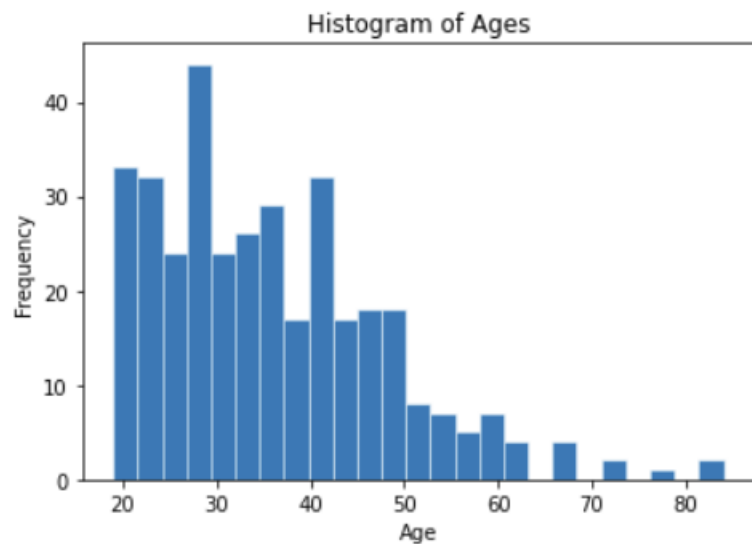
Total Users H2 2021: 219.734

```
investment_profile_level
no_experience      69249
novice             60008
advanced           25334
expert             19888
Name: user_id, dtype: int64
```

```
origin_funds
salary      96179
savings     40937
investments 23609
family_financial_support 5916
mining       3370
Name: user_id, dtype: int64
```

```
phone_country
FR      48539
GB      43614
CH      24975
VN      10632
DE       7707
Name: user_id, dtype: int64
```

```
total_wealth_usd
0_to_50k      139118
50k_to_200k   22396
200k_to_1m    9328
1m_to_5m      2298
5m_or_more    1253
Name: user_id, dtype: int64
```





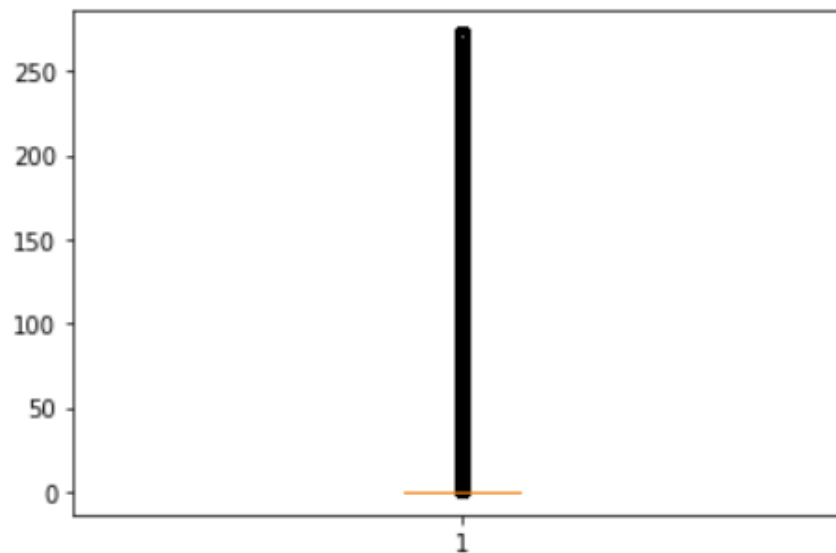
SWISSBORG – DATA ANALYST

IDENTITY DATA

Verification Approved

```
year  month
2021   7      18175
      8      23900
      9      22063
     10      21967
     11      31176
     12      24512
2022   1       3162
      2       1834
      3       1567
Name: event_name, dtype: int64
```

Days between Phone and Approved



days	
count	1,033,896
mean	11
std	33
min	0
25%	0
50%	0
75%	0
max	272



SWISSBORG – DATA ANALYST

TRANSACTION DATA - CLIENT

SUM()

deposit_usd 1,042,682,375
withdrawal_usd -489,313,145
trade_volume_usd 1,842,656,376
yield_subscription_usd 396,030,122
yield_redemption_usd -72,065,383
total_client 323,964,739
dtype: float64

	deposit_usd	withdrawal_usd	trade_volume_usd	yield_subscription_usd	yield_redemption_usd	total_client
count	493,711	493,711	493,711	493,711	493,711	493,711
mean	2,112	-991	3,732	802	-146	656
std	23,227	12,051	77,937	21,214	7,498	22,404
min	0	-2,923,778	0	0	-3,275,795	-3,275,795
25%	0	0	31	0	0	0
50%	21	0	221	0	0	0
75%	545	0	1,090	0	0	0
max	5,826,211	0	23,743,588	6,352,583	0	6,352,583

user_id
32f23402478aa363d46e7bf9135b2f2d 12,606,721
3f3379ebc64bbded932f7f23483753d9 8,212,391
adc4a2a69fe357418ef358a1d1162073 5,849,583
156e8f9435078ece1a9293699fcc1268 5,463,833
9aa76fcdd1f17b36ae9c61f335a14ab6 5,100,151
1eaf130273b085b1c746fa63eafd7c64 5,009,384
c7df73a940f8ed2fbdafdab4ff8cc7da5 4,323,938
193f6a07e9b1a3f22afa7ad05d10e270 4,019,140
9d83a9939c99318e61fbdd5aa4a8f490 3,325,923
596a36bb1b29fd503f60b9ce3c3eb9fd 2,815,578
Name: total_client, dtype: float64

		deposit_usd	withdrawal_usd	trade_volume_usd	yield_subscription_usd	yield_redemption_usd	total_client
year	month						
2021	7	47,268,331	-11,118,312	30,142,910	23,037,579	-1,714,402	21,323,177
	8	129,623,247	-45,472,721	187,466,918	54,018,816	-8,949,474	45,069,341
	9	125,390,280	-59,997,383	262,660,122	37,935,103	-7,033,153	30,901,950
	10	163,892,348	-78,565,905	305,756,825	60,074,266	-11,403,128	48,671,138
	11	192,938,447	-96,026,054	312,275,378	63,681,367	-11,302,345	52,379,022
	12	157,522,158	-72,895,079	256,969,049	50,234,543	-8,677,224	41,557,319
2022	1	117,371,184	-56,013,797	209,601,937	52,892,912	-12,187,820	40,705,092
	2	63,122,637	-37,584,336	159,266,504	30,949,744	-7,315,761	23,633,983
	3	45,553,743	-31,639,559	118,516,733	23,205,791	-3,482,075	19,723,717



SWISSBORG – DATA ANALYST

TRANSACTION DATA

	deposit_usd	withdrawal_usd	trade_volume_usd	yield_subscription_usd	yield_redemption_usd	total_client
premium_tier						
community	254,948,682	-91,483,621	371,483,216	174,768,234	-34,648,365	140,119,869
standard	674,470,682	-365,627,203	818,062,633	111,274,126	-14,899,236	96,374,889
genesis	105,827,997	-30,765,122	646,414,886	103,846,476	-22,377,688	81,468,788
generation	7,435,014	-1,437,200	6,695,641	6,141,287	-140,095	6,001,192

	deposit_usd	withdrawal_usd	trade_volume_usd	yield_subscription_usd	yield_redemption_usd	total_client
phone_country						
FR	137,735,965	-37,144,019	435,140,895	92,638,971	-13,170,205	79,468,765
GB	414,379,861	-253,727,206	564,554,962	93,133,678	-18,758,561	74,375,116
CH	188,658,429	-59,118,169	401,727,575	85,600,035	-15,626,933	69,973,102
BE	31,781,111	-10,485,615	92,337,338	23,300,879	-8,203,073	15,097,806
DE	65,887,096	-36,654,372	75,567,658	13,562,953	-1,835,967	11,726,986

	deposit_usd	withdrawal_usd	trade_volume_usd	yield_subscription_usd	yield_redemption_usd	total_client
investment_profile_level						
expert	405,136,002	-170,573,679	650,554,502	192,038,487	-32,189,339	159,849,148
novice	263,322,496	-142,788,412	506,972,874	83,097,272	-17,816,032	65,281,239
advanced	200,160,753	-101,599,649	396,992,443	68,369,836	-11,067,701	57,302,135
no_experience	174,063,124	-74,351,405	288,136,556	52,524,527	-10,992,310	41,532,217



SWISSBORG – DATA ANALYST

TRANSACTION DATA

	deposit_usd	withdrawal_usd	trade_volume_usd	yield_subscription_usd	yield_redemption_usd	total_client
origin_funds						
salary	415,985,770	-190,544,445	595,854,516	159,624,425	-30,787,951	128,836,474
investments	259,356,990	-126,607,866	472,462,110	102,329,013	-15,562,384	86,766,629
savings	301,839,605	-143,866,482	585,061,945	95,633,523	-16,690,711	78,942,812
family_financial_support	18,099,107	-5,859,114	128,987,705	19,285,185	-4,534,687	14,750,498
inheritance	24,408,783	-8,598,011	25,964,035	11,098,278	-1,254,300	9,843,978
pension	19,320,320	-11,905,951	30,414,920	6,949,962	-3,067,711	3,882,251
mining	3,671,801	-1,931,277	3,911,145	1,109,737	-167,640	942,097

	deposit_usd	withdrawal_usd	trade_volume_usd	yield_subscription_usd	yield_redemption_usd	total_client
total_wealth_usd						
0_to_50k	385,426,085	-190,625,798	564,272,806	127,409,210	-25,396,566	102,012,644
200k_to_1m	221,262,613	-97,648,752	540,724,576	91,544,725	-16,840,523	74,704,202
50k_to_200k	224,568,591	-108,785,334	329,479,775	82,685,072	-16,474,739	66,210,333
1m_to_5m	136,757,639	-69,118,871	293,671,142	65,284,704	-11,665,261	53,619,443
5m_or_more	74,667,448	-23,134,390	114,508,077	29,106,411	-1,688,295	27,418,117



SWISSBORG – DATA ANALYST

TRANSACTION DATA - SWISSBORG

```
exchange_fees_usd    11,415,162
yield_fees_usd        48,051
withdrawal_fees_usd   2,648,784
acquisition_cost_usd  10,819,949
total_company         14,111,997
dtype: float64
```

	exchange_fees_usd	yield_fees_usd	withdrawal_fees_usd	acquisition_cost_usd	total_company
count	493,711	493,711	493,711	493,711	493,711
mean	23	0	5	22	29
std	149	1	22	21	155
min	-0	-0	-0	5	-0
25%	0	-0	-0	10	0
50%	2	0	0	18	3
75%	10	0	-0	24	15
max	21,934	189	1,194	393	21,934

```
user_id
d92e59568ae11a6404e02a001676dcc3    157,500,050
32f23402478aa363d46e7bf9135b2f2d    110,965,483
c420c572ac33575ca35fdbaf7f2cdc925    95,981,785
c49f028bb4e3a2497a704d7e892836b5     61,713,559
48b3a04b428c30d0ff454718e45bad64     20,379,781
5f6603def8f46a27a4280f8dec709a01     17,904,384
596a36bb1b29fd503f60b9ce3c3eb9fd     16,403,576
ed7034ae1ae292e3706d1cb0dd4ebaaa     15,570,615
16a2da0a599887095142eadb575ff5f8     15,062,536
eeacd62ec771d3738c36ea8a3e74ec50     13,857,988
Name: trade_volume_usd, dtype: float64
```

		exchange_fees_usd	yield_fees_usd	withdrawal_fees_usd	acquisition_cost_usd	total_company
year	month					
2021	7	266,888	857	72,566	568,191	340,311
	8	1,025,783	2,932	188,368	941,568	1,217,084
	9	1,337,211	3,816	311,447	1,097,512	1,652,474
	10	1,827,622	7,943	444,625	1,377,067	2,280,190
	11	2,289,322	9,661	566,816	1,918,557	2,865,799
	12	1,807,741	8,360	420,557	1,868,028	2,236,657
2022	1	1,305,304	6,845	286,767	1,354,022	1,598,916
	2	846,517	4,345	210,596	882,756	1,061,458
	3	708,775	3,293	147,041	812,248	859,109



SWISSBORG – DATA ANALYST

TRANSACTION DATA - SWISSBORG

	exchange_fees_usd	yield_fees_usd	withdrawal_fees_usd	acquisition_cost_usd	total_company
premium_tier					
standard	8,181,561	16,707	2,339,814	9,253,700	10,538,083
community	2,831,738	30,425	275,066	1,480,412	3,137,229
genesis	366,651	99	31,921	77,603	398,671
generation	35,211	821	1,983	8,235	38,015

	exchange_fees_usd	yield_fees_usd	withdrawal_fees_usd	acquisition_cost_usd	total_company
phone_country					
GB	4,480,678	15,374	1,385,964	2,972,425	5,882,015
CH	2,300,918	9,253	307,532	2,647,725	2,617,703
FR	1,373,797	8,892	291,877	2,877,947	1,674,566
DE	591,449	2,446	159,412	423,228	753,307
BE	533,261	1,714	64,039	585,922	599,015

	exchange_fees_usd	yield_fees_usd	withdrawal_fees_usd	acquisition_cost_usd	total_company
investment_profile_level					
novice	3,495,695	14,360	951,506	3,736,606	4,461,560
expert	3,340,969	16,262	515,944	1,554,448	3,873,174
no_experience	2,523,206	8,629	665,344	3,844,815	3,197,179
advanced	2,055,292	8,800	515,991	1,684,079	2,580,083

```
user_id
8d17923cb0b2f15f08e1f21ce566feb9 137,358
ed7034ae1ae292e3706d1cb0dd4ebaaa 130,547
f2c695ee68f0a8c499208e460d388465 68,989
69070bebcdb3422e96b3f44adfc925e 65,627
08aea0153a8252bade9cdc761e1e7ed1 65,294
eeacd62ec771d3738c36ea8a3e74ec50 64,365
e9199cd66c6f865ad3075e7dec6c1463 64,029
adc4a2a69fe357418ef358a1d1162073 55,618
d92e59568ae11a6404e02a001676dcc3 54,479
69b57278c0186c0cb465da93c53de797 53,599
Name: total_company, dtype: float64
```



SWISSBORG – DATA ANALYST

TRANSACTION DATA - SWISSBORG

	exchange_fees_usd	yield_fees_usd	withdrawal_fees_usd	acquisition_cost_usd	total_company
origin_funds					
salary	4,694,504	23,826	1,249,078	6,188,512	5,967,408
savings	3,716,505	13,181	802,869	2,941,491	4,532,555
investments	2,307,640	6,443	449,214	1,166,593	2,763,297
pension	279,777	2,973	49,918	158,086	332,669
inheritance	215,009	1,206	35,561	116,554	251,776
family_financial_support	165,929	218	48,275	191,687	214,422
mining	35,797	204	13,869	57,025	49,870

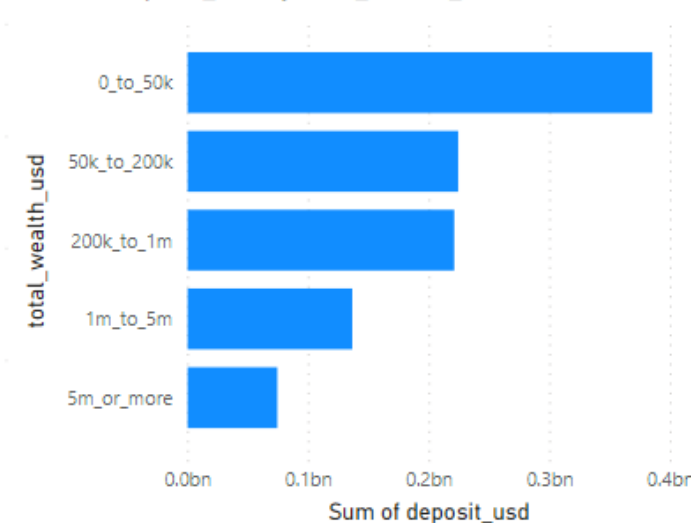
	exchange_fees_usd	yield_fees_usd	withdrawal_fees_usd	acquisition_cost_usd	total_company
total_wealth_usd					
0_to_50k	5,013,848	18,285	1,600,470	7,961,398	6,632,603
50k_to_200k	2,692,026	15,667	539,723	1,844,092	3,247,416
200k_to_1m	2,275,992	9,396	339,281	791,085	2,624,668
1m_to_5m	1,029,042	4,027	134,318	169,973	1,167,388
5m_or_more	404,254	676	34,992	53,402	439,923



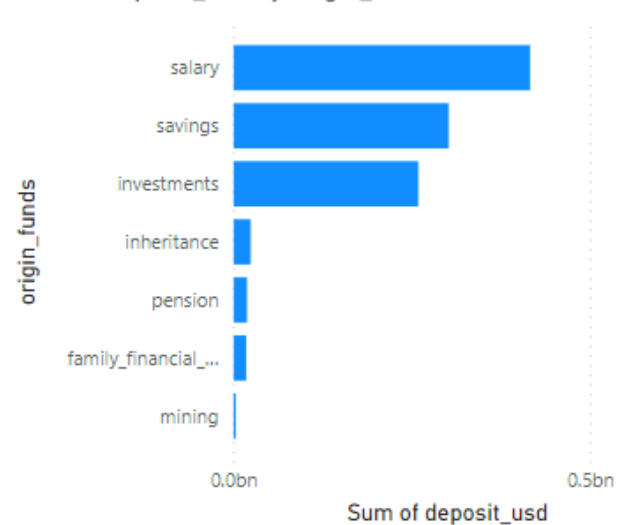
SWISSBORG – DATA ANALYST

TRANSACTION DATA - DEPOSIT

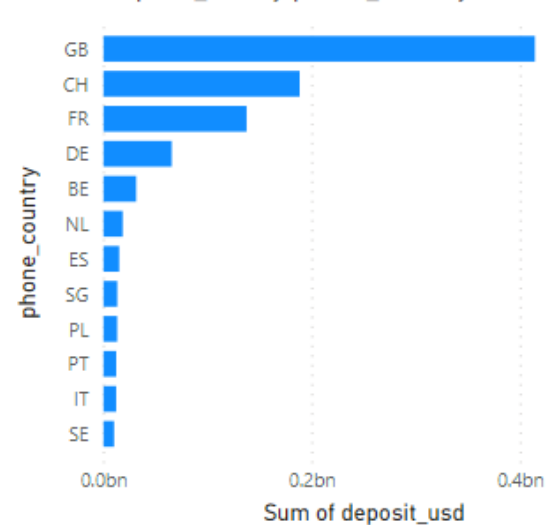
Sum of deposit_usd by total_wealth_usd



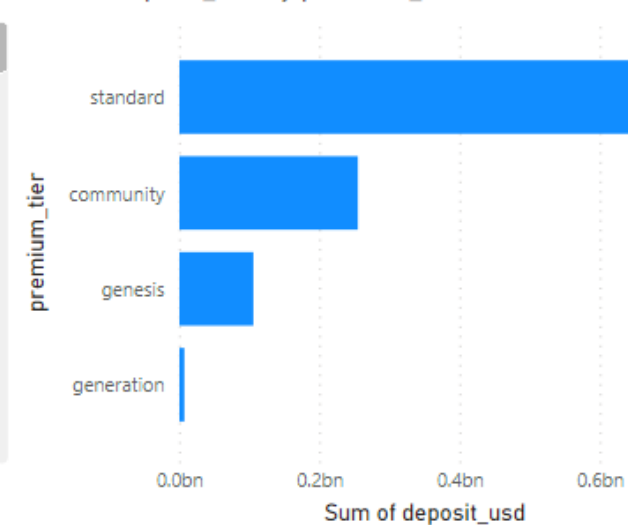
Sum of deposit_usd by origin_funds



Sum of deposit_usd by phone_country



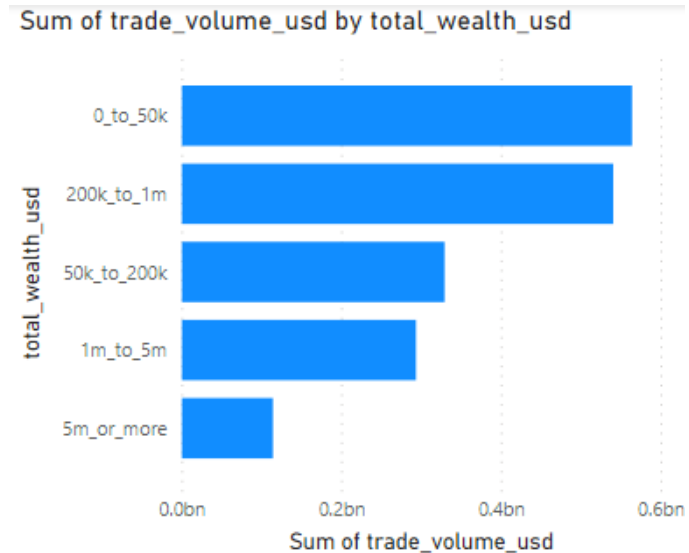
Sum of deposit_usd by premium_tier





SWISSBORG – DATA ANALYST

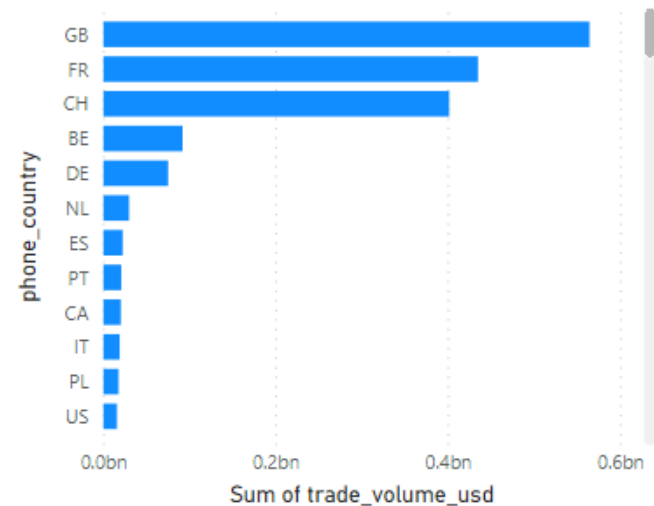
TRANSACTION DATA - TRADE VOLUME



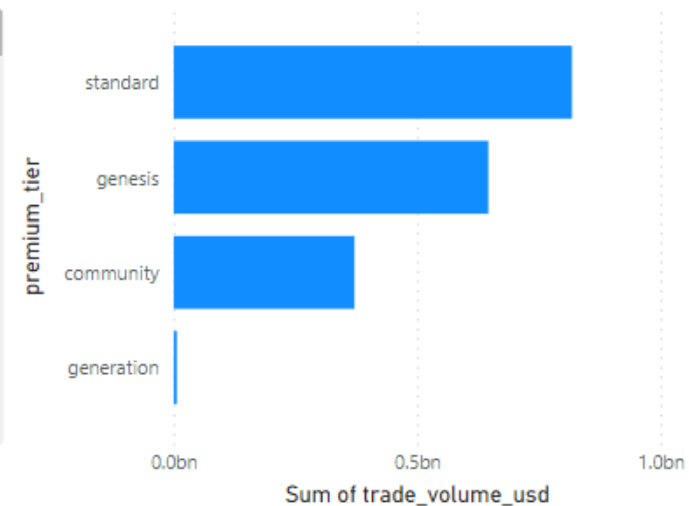
Sum of trade_volume_usd by origin_funds



Sum of trade_volume_usd by phone_country



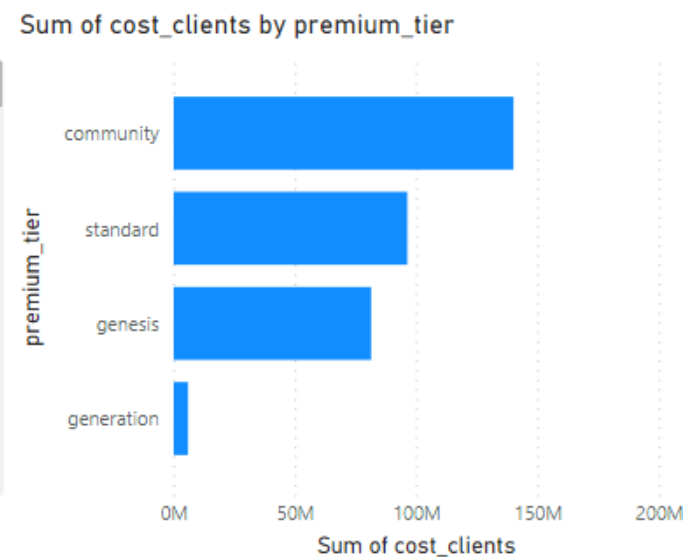
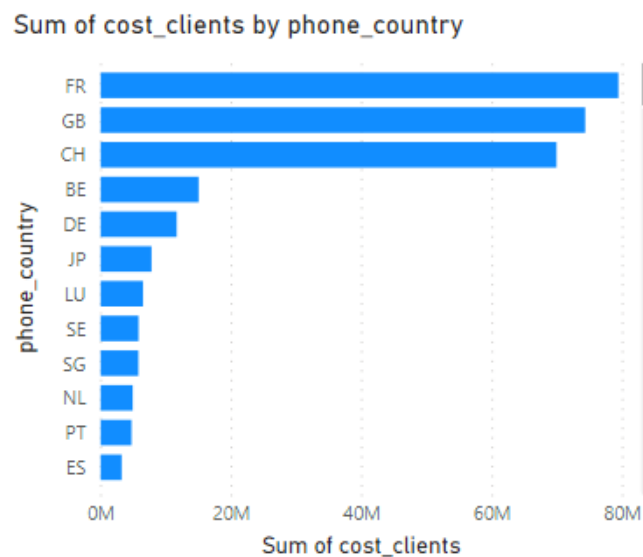
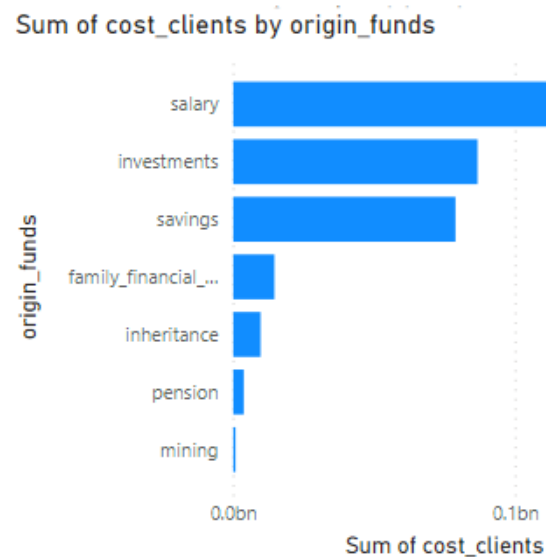
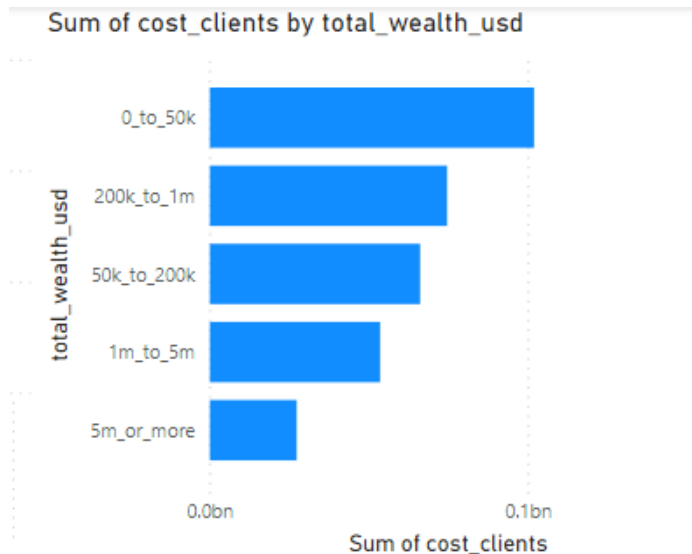
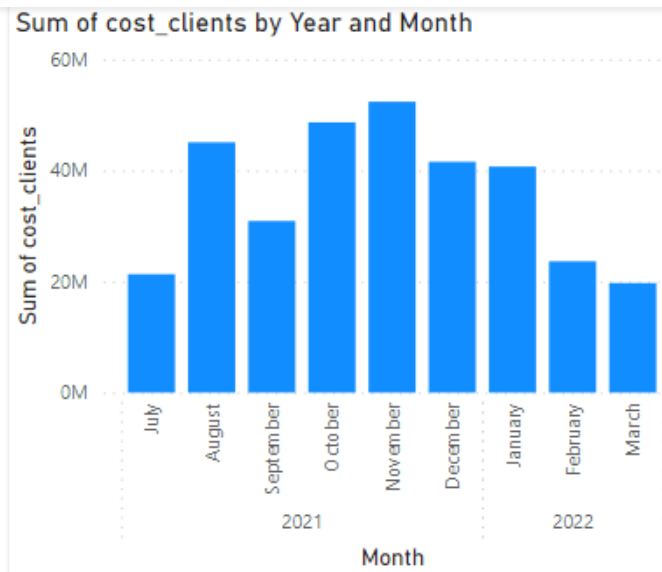
Sum of trade_volume_usd by premium_tier





SWISSBORG – DATA ANALYST

TRANSACTION DATA – COST OF CLIENTS

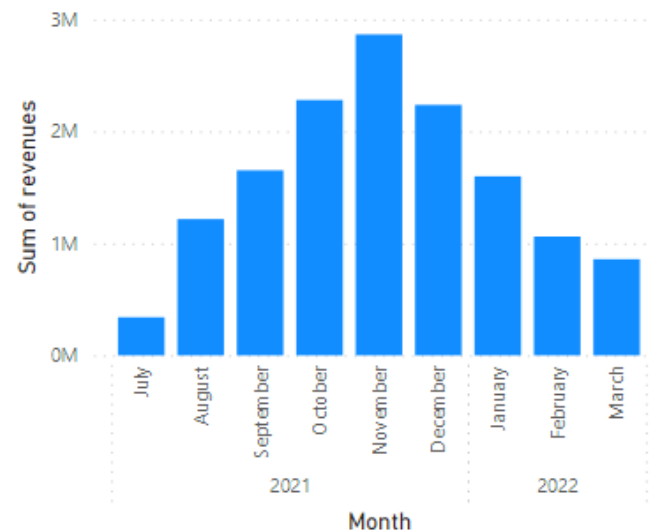




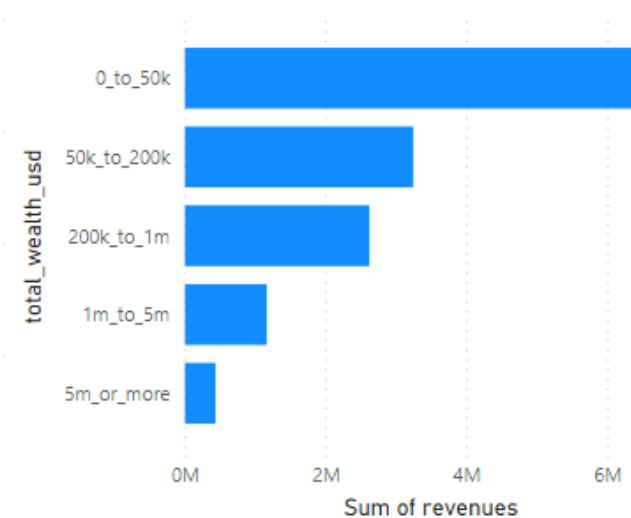
SWISSBORG – DATA ANALYST

TRANSACTION DATA - REVENUES

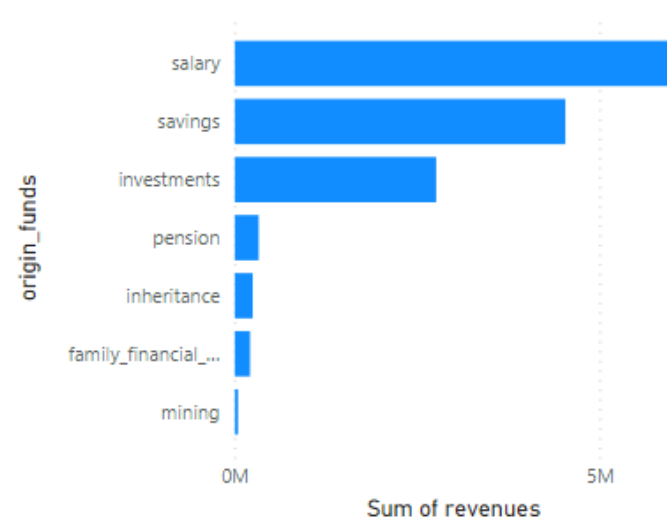
Sum of revenues by Year and Month



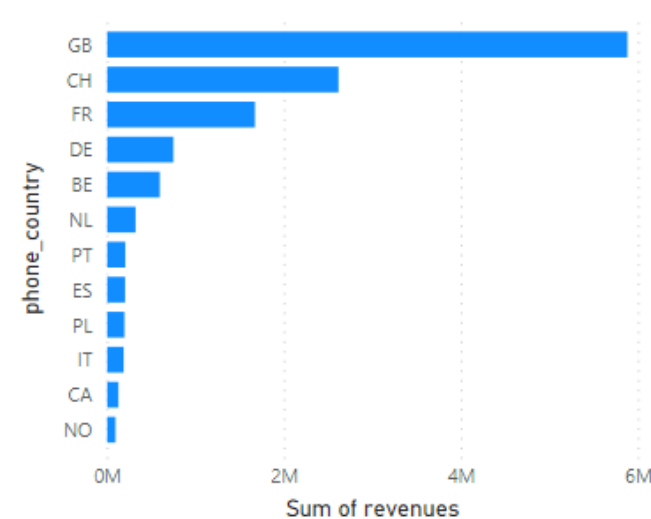
Sum of revenues by total_wealth_usd



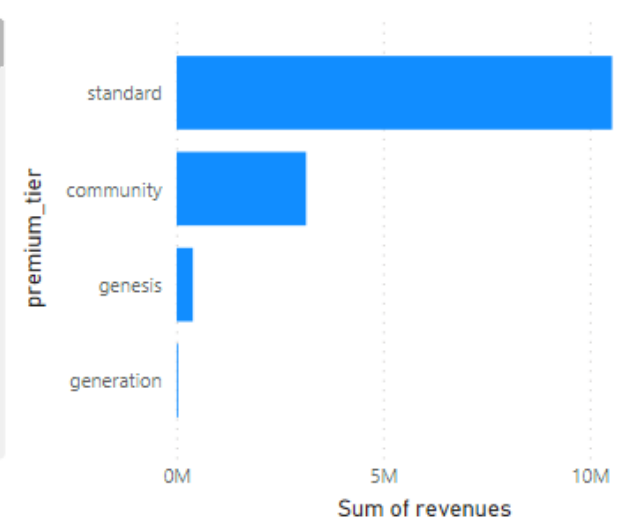
Sum of revenues by origin_funds



Sum of revenues by phone_country



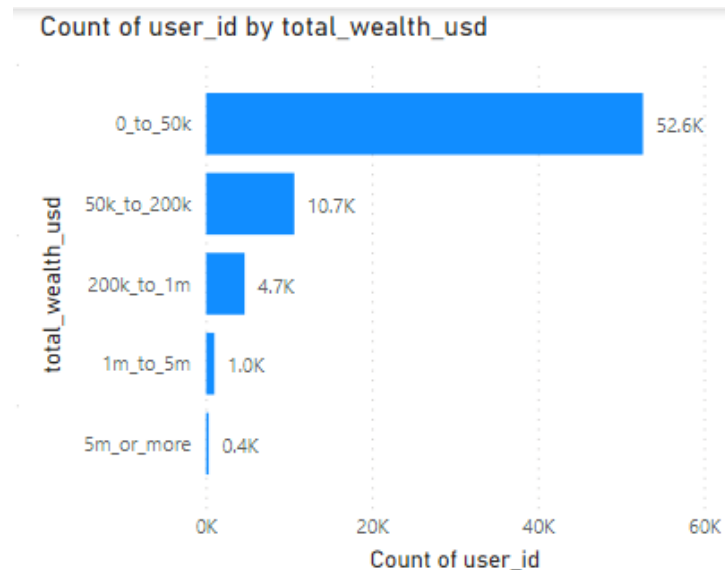
Sum of revenues by premium_tier



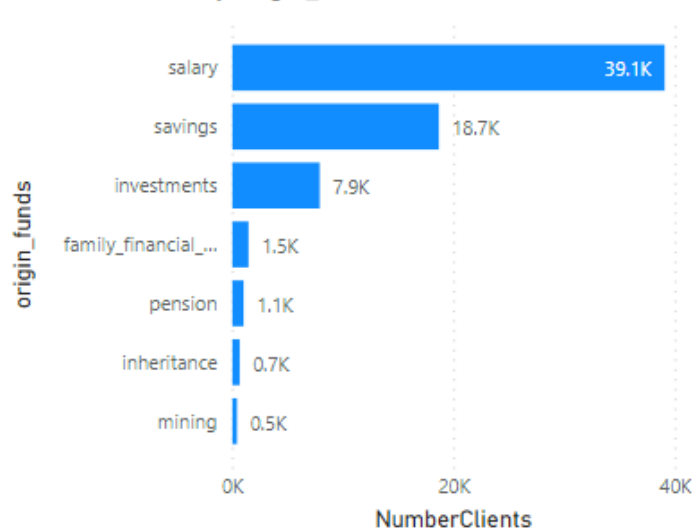


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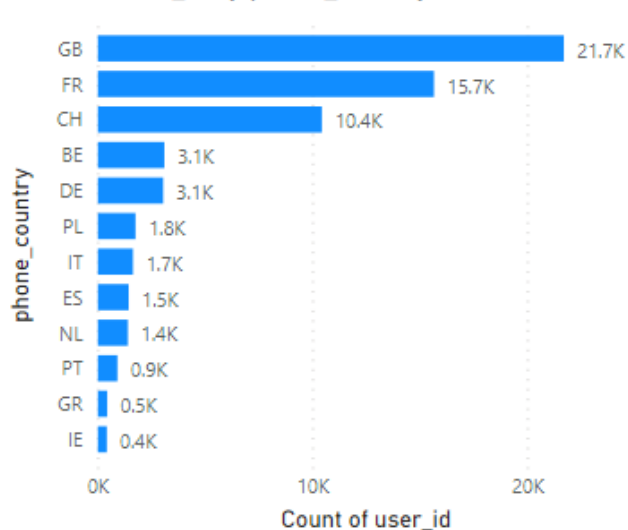
TRANSACTION DATA – NUMBER OF USERS



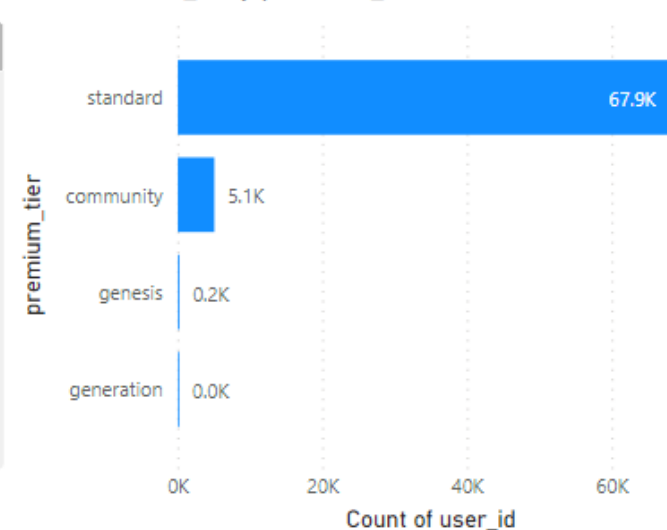
NumberClients by origin_funds



Count of user_id by phone_country



Count of user_id by premium_tier





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SQUAD I - ACQUISITION FLOW

Attraction Metrics	■ Number of recurring visitors	<ul style="list-style-type: none">• people who entered Swissborg App and decided to come back later.• Measure: Phone Verification
	■ Traffic on mobile devices	<ul style="list-style-type: none">• where visitors come from when they land the App• Google Analytics, for example, traffic sources are shown even in detail: in addition to knowing which websites your visitors came from, you even receive demographic data about them (country, language, age, etc.).
Conversion Metrics	■ Bounce rate	<ul style="list-style-type: none">• how many people left your site on the same page they entered, without visiting other pages on your site or being interested in any additional material.
	■ Total conversions	<ul style="list-style-type: none">• the Steps: PhoneUpdated – EmailUpdated – AddressUpdated - LanguageUpdated – QuestionsUpdated – OnboardingCompleted – VerificationApprove – First Deposit



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SQUAD I - ACQUISITION FLOW

Conversion Metrics	▪ Funnel conversion rate	<ul style="list-style-type: none">• how effective your strategy is in each part of the funnel.• In doing so, you may notice that most conversion issues focus on a specific stage of the funnel, while others perform well.
Revenue Metrics	▪ Bounce rate	<ul style="list-style-type: none">• on a scale of 0 to 10, how likely are your customers to recommend the App to someone.• measuring the degree of satisfaction and marketing potential of your current customers.



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SQUAD II – PRODUCT DISCOVERY

Revenue Metrics	■ CAC: Customer Acquisition Cost	<ul style="list-style-type: none">• how much you spend to get each new customer for your product or service.
	■ MRR: Monthly Recurring Revenue	<ul style="list-style-type: none">• this model need to have a high retention rate, that is, keep customers for as long as possible.• assess the need to make changes to your pricing strategy.
	■ ROI: Return on Investment	<ul style="list-style-type: none">• Return on Investment , which states how much the marketing efforts are producing profit for the company, is also an indispensable metric .• is the main marketing metric the company should follow.
	■ LTV: Lifetime Value	<ul style="list-style-type: none">• predicting how much money should expect to earn, on average, from each customer for as long as they buy from you.• average ticket and customer abandonment rate to know how long they use your product on average.



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SQL

```
print(sqldf("SELECT * FROM identity_data LIMIT 5;", locals()))
```

[126] ✓ 29.4s

...	event_name	event_id \
0	PhoneUpdated	5d650c396a779e48c65d90325bddb0d8
1	LanguageUpdated	524e613a8656a4ae9552bb7206ed26ec
2	PhoneUpdated	5cf7beefcb2a0a37500e5735f958c248
3	LanguageUpdated	60ac723b3bacf1ddfa1960b54f0c41ce
4	EmailUpdated	4c42936c5d8b6523f26d754f7aa3440c

	user_id	timestamp	phone_country \
0	0000087e5c27d962f611bc15d9c59ce7	2021-12-06	CH
1	0000087e5c27d962f611bc15d9c59ce7	2021-12-06	CH
2	00006df8f5d6d0f0b3dcb11e104fa4b8	2021-12-21	IE
3	00006df8f5d6d0f0b3dcb11e104fa4b8	2021-12-21	IE
4	00006df8f5d6d0f0b3dcb11e104fa4b8	2021-12-21	IE

	investment_profile_level	origin_funds	country_code	language	user_age \
0	None	None	None	None	NaN
1	None	None	None	FR	NaN
2	None	None	None	None	NaN
3	None	None	None	EN	NaN
4	None	None	None	EN	22

```
q = """
select
  event_name, count(*) as "number_user"
from identity_data
group by event_name
order by number_user desc;

"""
#print("'" * 80)
#print("aggregation")
#print("'" * 80)
#print(q)
print(sqldf(q, locals()))
```

✓ 27.9s

	event_name	number_user
0	PhoneUpdated	219734
1	EmailUpdated	180638
2	AddressUpdated	177055
3	QuestionsUpdated	174199
4	OnboardingCompleted	144140
5	VerificationApproved	133602
6	LanguageUpdated	33761
7	VerificationRejected	23470



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SQL

	country	user_id	avg_acquisition_cost	\
0	GB	35fa184ceb88eabc6379b29b870812f5	10	
1	PT	aa1f721eefb95c0bb315ed59b9eb71	17	
2	BE	e38ba8b62893ed656435e659599f1611	15	
3	GB	fa36319a000ef488de8d59852b16a254	10	
4	CH	8a7bc6f7350131816c620a54727c76d6	20	
...	
67416	GB	00862ef80dbf7d4f8b6b7fe3c0d6bcda	20	
67417	GB	00802169dfac0331b158253a77fd1e1f	17	
67418	FR	00689495914b5d12ddb302bae979773c	15	
67419	PT	0047b3f201f68fc1d3ddef2ea12bd279	15	
67420	FR	002511fe35564ca8e2569c5fd48bdb8c	15	

	avg_revenueus
0	9,125
1	7,361
2	7,130
3	5,569
4	5,511
...	...
67416	0
67417	0
67418	0
67419	0

```
# acquisition cost and revenues by country
q = """
    select
        phone_country as "country", avg(acquisition_cost_usd) as "a
    from transaction_data
    where days <= 90
    group by phone_country
    order by avg_revenueus desc;

"""

#print("'" * 80)
#print("aggregation")
#print("'" * 80)
#print(q)
print(sqldf(q, locals()))
```

✓ 15.9s

	country	avg_acquisition_cost	avg_revenueus
0	UY	16	153
1	HK	11	117
2	NO	19	89
3	MZ	17	76
4	GI	12	76
..
98	NP	10	1



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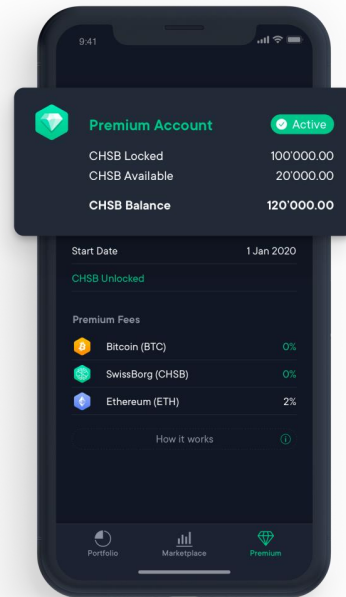
UPDATE

- Correlations between some metrics: origen_funds, user_age, invest_profile, etc
- More details on the graphics, as titles, etc
- Difference between the date of events.
- Finish the Analysis using SQL
- Optimize the codes and models

DATA ANALYST
Tech Challenger



SwissBorg



Anderson Cruz

linkedin.com/in/anderjcruz/
linktr.ee/andercruz

