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# Maximizing Mortgage Renewals: Data-Driven Strategies for Customer Retention

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# Our Plan

- Define the problem
- Explain the data
- Profile the clients (Make Groups)
- Predict Run-offs
- Recommendations

# The Problem

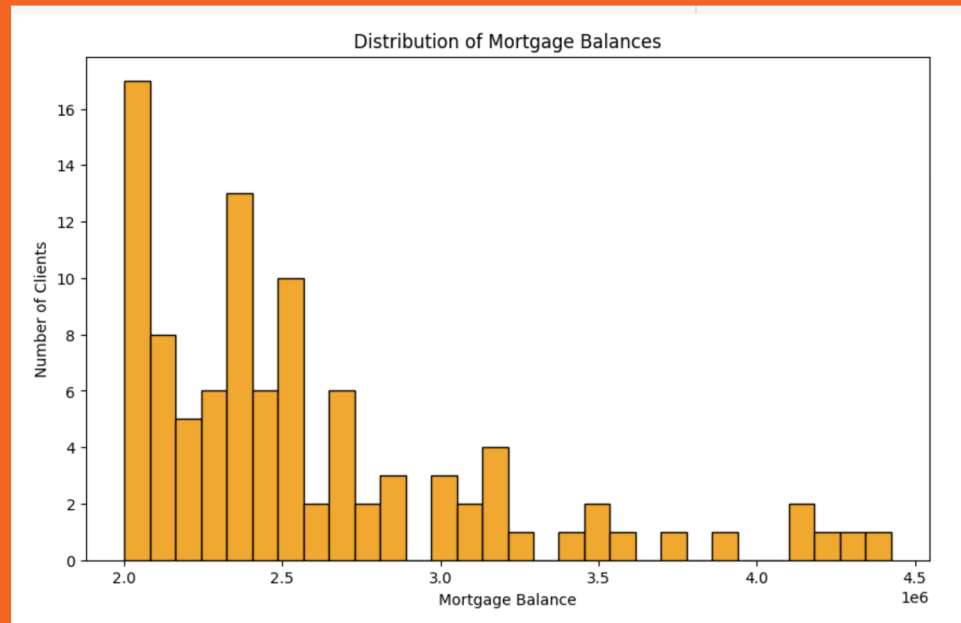
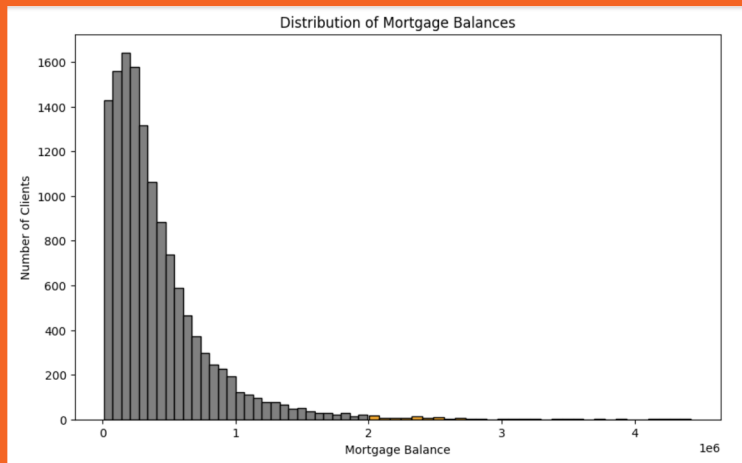
- Medium-sized bank
- Mortgage renewal date coming up
- Next two years crucial - over \$5B at stake

# Cleaning the data

Drop Income & VISA\_balance

AND

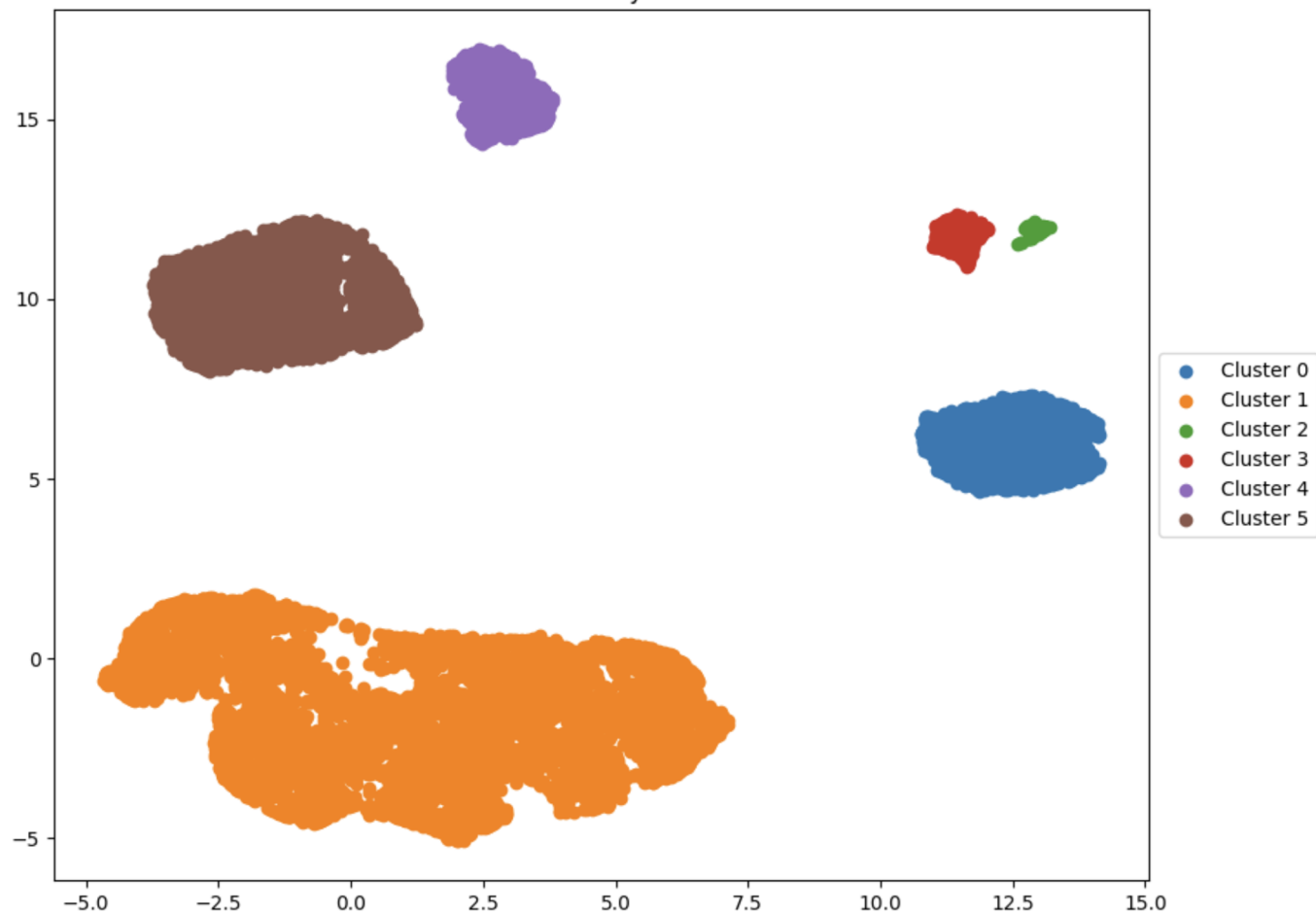
Total	Zero_Beacon_Score	Percentage	New_Total
13821	296	0.02141668476	13525



The top 10% of customers contribute 31.72% of the total mortgage balance.  
The top 20% of customers contribute 49.29% of the total mortgage balance.  
The top 30% of customers contribute 62.35% of the total mortgage balance.  
The top 40% of customers contribute 72.67% of the total mortgage balance.

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- Avg\_Monthly\_Transactions
- Beacon\_Score
- Mortgage\_Balance
- Not\_Mortgage\_Balance
- Services
- Tenure\_In\_Months

Clusters found by HDBSCAN



client_label	A	B	C	D	E	Z
Beacon_Score	753.6163737	768.2649033	757.5411533	780.870387	769.9843043	598.6607143
Mortgage_Balance	848966.1838	213979.408	226435.2385	174903.6775	232614.3533	458982.0947
Services	4.410653372	5.975523095	5.440118285	5.00540054	3.935104135	4.501373626
Avg_Monthly_Transactions	26.8126476	39.83971575	79.91227206	14.36183618	8.266827649	37.46016484
Not_Mortgage_Balance	131398.1021	298646.2416	36210.00542	35660.13277	22546.59137	110134.1724
Age	56.30910522	62.28938018	57.30113356	72.76147615	62.7195895	59.34203297
Tenure_In_Months	164.7074259	261.8310304	240.3504189	364.9171917	130.5831573	183.7870879
TermInMonths	51.05079969	55.01389657	55.95798423	54.86291629	54.39445618	53.49565018
TermToMaturity	13.36580898	12.84409791	13.16982093	12.53150315	12.86542409	13.10221634
NumberOfParties	2.000462008	1.795315173	1.689707574	1.685448545	1.693580843	1.862923535
InterestRate	0.03143064812	0.03084405843	0.0297760207	0.03050414041	0.03099067311	0.03191291209
not mortgage lending	66233.82774	150332.3443	17612.45824	17859.14634	11246.82971	55527.27188
deposit	65164.27431	148313.8972	18597.54718	17800.98642	11299.76167	54606.90055
Count	3811	2533	2029	1111	3313	728



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**A: High Mortgage Balance**

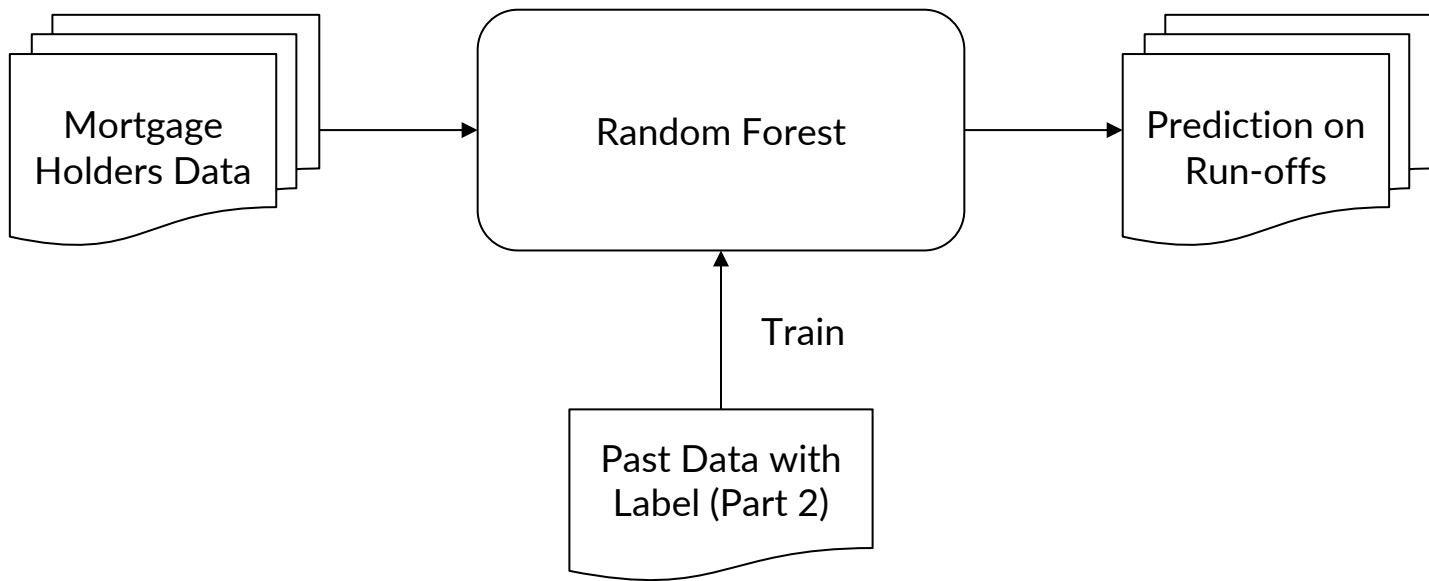
**B: High Potential Clients**

**C: High Transaction**

**D: High Tenure in months**

**E: Other Clients**

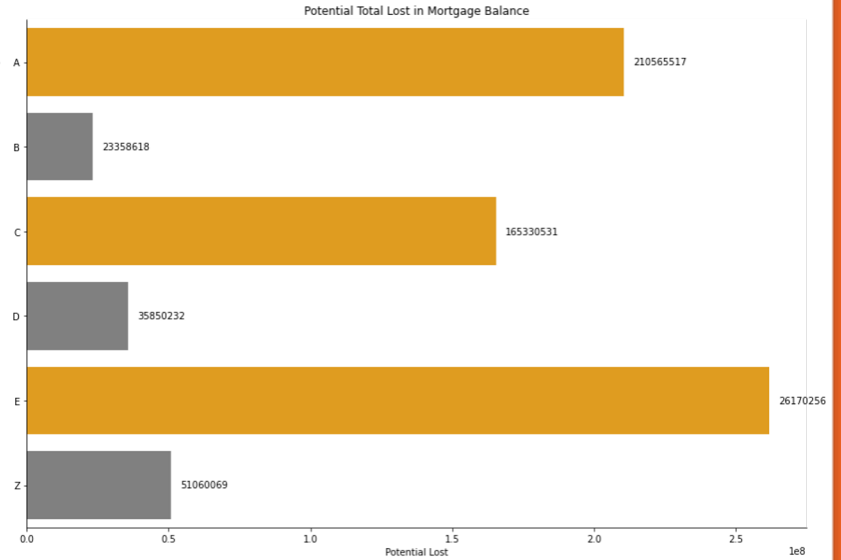
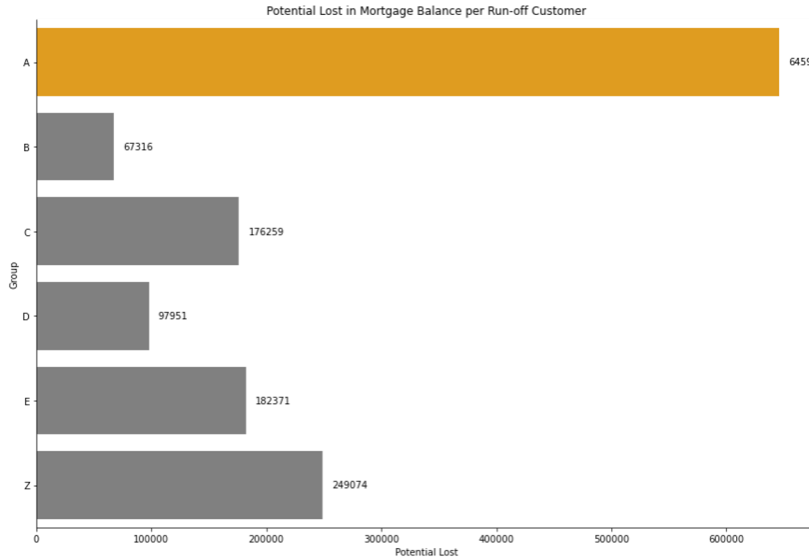
**Z: Low Beacon Score**



# Predicted Run-offs

Overall Run-off Rate	26.74%					
Group	A	B	C	D	E	Z
# run-offs	326	347	938	366	1435	205
% run-offs	8.55%	13.7%	46.23%	32.94%	43.31%	28.16%

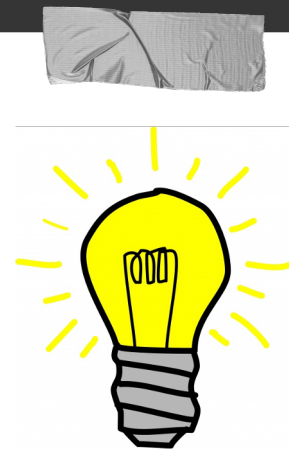




	A	A, C, E	All
Potential Rescue	\$210,565,517	\$637,598,610	\$696,807,500
% in Total Balance	4%	12.3%	13.4%
% in Total Potential Loss	30%	91.5%	100%

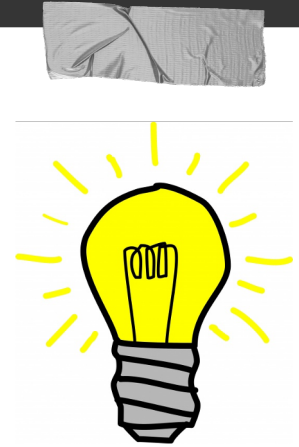
## — Conclusion

- First choice: Group A
- Last choice: Group Z
- Focus on mortgage balance: A, C, E
- No constraints: A to E except Z



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Thanks for watching !



## Appendix

- Zeye Gu: Clustering. Explanation of the data. Provide the direction of the use case.
- Jialiang Guo: Prediction of Run-offs
- Wenbin(Freya) Li: Exploratory Data Analysis, Potential Loss
- Parth Gulati: Creating Summary csv for all clusters