ANZ Assignment

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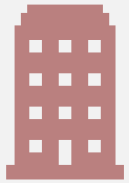
1. List of Customers

- Bank XYZ needs to choose the suppliers which are having contracts of high values.
- Data needs to be combined from the previous years to understand the consistent contractors/suppliers.
- Decision can be influenced by the duration of the contract.

Suppliers with respect to the contract worth in 2020

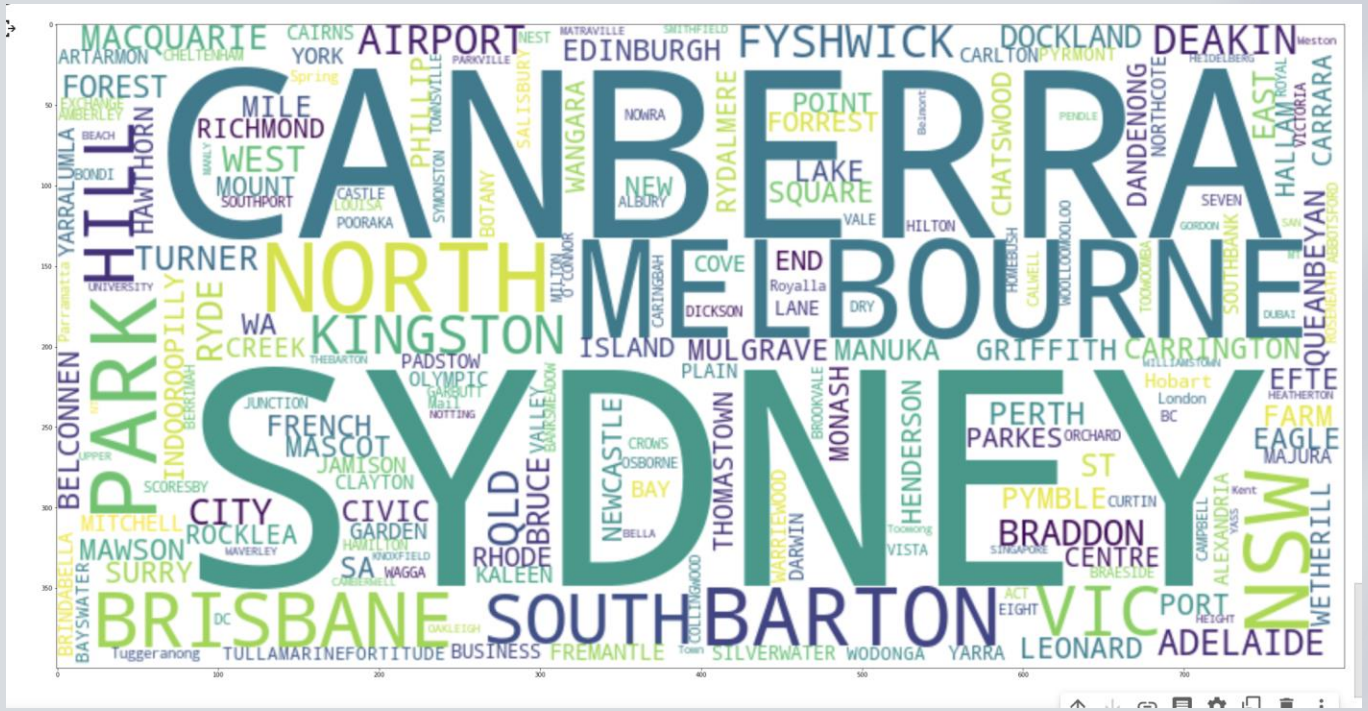

FMS ACCOUNT RESERVE BANK OF AUSTRALIA 2020 Q2
FMS ACCOUNT RESERVE BANK OF AUSTRALIA 2019 Q3
FMS ACCOUNT RESERVE BANK OF AUSTRALIA 2019 Q4
FMS ACCOUNT RESERVE BANK OF
BOEING DEFENCE AUSTRALIA LTD 2019 Q4
BOEING DEFENCE AUSTRALIA LTD 2020 Q2
RAYTHEON AUST PTY LTD 2019 Q3
LAING O'ROURKE AUSTRALIA CONSTRUCTION PTY LTD 2019 Q3
BROADSPECTRUM (AUSTRALIA) PTY LTD - GEMS PROJECT 2019 Q3
SPOTLESS FACILITY SERVICES PTY LTD GEMS PROJECT 2019 Q3
NAVAL SEA SYSTEMS COMMAND 2019 Q4
SERCO AUSTRALIA PTY LIMITED 2019 Q3
DMOJSF OFFICIAL AUSTRALIAN ACCOUNT PSFD 2019 Q4
UNIVERSITY OF NSW ADFA UNSW@ADF 2019 Q4
JPO PROJECT PAMMANDI CBASS EMBASSAY 2019 Q4
RAYTHEON AUSTRALIA PTY LTD 2019 Q4
LENDLEASE BUILDING PTY LIMITED 2020 Q4
PMA-262 TRITON DPS CO-OP PROGRAM 2020 Q2
DEPARTMENT OF DEFENSE OF THE UNITED STATES OF AMERICA 2019 Q3
LOCKHEED MARTIN AUSTRALIA PTY LTD 2019 Q1
CPB
CANSTRUCT
Clark
C S ENERGY LIMITED 2020 Q2
AUSTAL SHIPS PTY LTD 2020 Q2
Accenture Australia Pty Ltd 2019 Q3
MEGT
Pfizer
NAVAL GROUP 2020 Q1
QANTAS AIRWAYS LIMITED 2020 Q2
JONES LANG LASALLE (ACT) PTY LIMITED 2019 Q3
LEIDOS AUSTRALIA PTY
Deka
COBS TELSTRA 2019 Q4
THALES AUSTRALIA LIMITED 2020 Q1
PALADIN HOLDINGS PTE
Telstra Australia
CSL Behring (Australia) Pty Ltd 2020 Q1
NGJ COOPERATIVE
THALES AUSTRALIA

2.a Optimum Facility Location



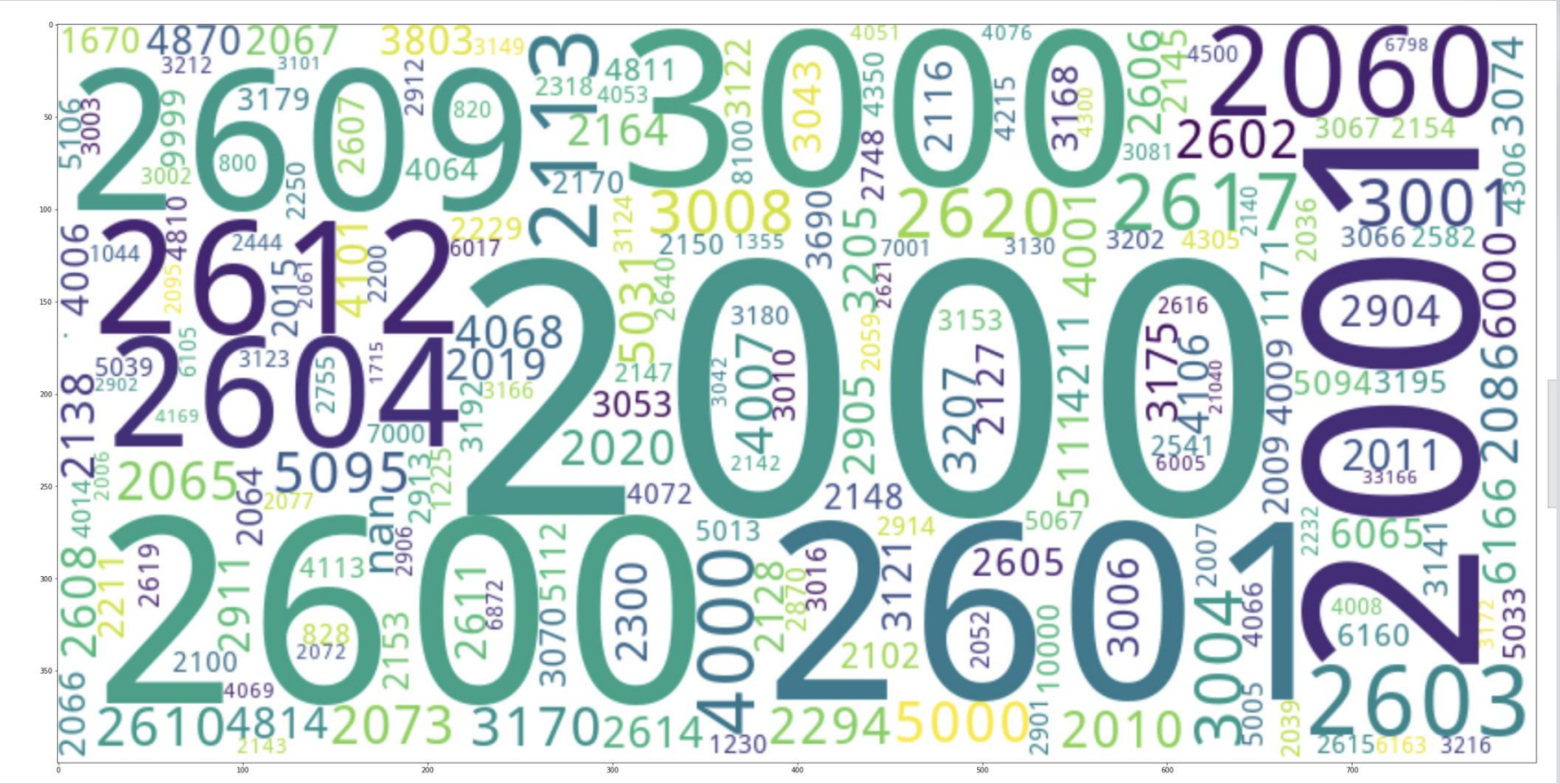
We can notice from data that most of the suppliers offices are located in Sydney, Melbourne & Canberra. So eventually office needs to be open on these particular locations.

Secondly, Bank might already have major branches operating in these cities so we can collect the zips of the office location & zips of suppliers to find the optimum office location for day-to-day operations.



World Map for the optimum locations

Zip Codes containing maximum contracts



2b. Office Rent vs Revenue

- We need to create a metric which calculates the overall revenue generated by opening the office in city vs suburbs, if revenue from city is really high & can offset the rent cost then, we should open the offices in cities.
- If Rent is high & revenue generated is quite low then we can go for less popular location.
- Future Work: It can be solved using Facility Optimization Problem

3. Problem Statement

Categorizing clusters in order to focus on the clusters with high overall profits, so bank can target the right customers.

Future Work
Recognize Optimum Location by treating them as Facility Optimization Problem.

Proposed solution

- Based on data, clustering algorithm can create meaningful clusters & as we have location in the dataset we can create choropleth maps with the clusters predicted by our model & use them to visualizing the clusters of contracts & get the better understanding about opening the office at targetted cluster.

Machine learning algorithm

- KMEANS
- DBSCAN

Pros

Easier to Implement.

Highly scalable.

Convergence guaranty .

Centroid's warm-start.

Adaptability to new instances.

Generalizes to clusters of different shapes and sizes.

Cons

- **Choosing k manually.**
- **depends on initial values.**
- **Dragged by outliers which can be offset by using HDBSCAN.**

- **Curse of Dimensionality**

Sample Implementation

As of now, we can see the clusters added in the DataFrame for further analysis & ready to be combined with Choropleth.

```
[527]: tender.head()
```

[527]:

Applicable Publish Date	Applicable Start Date	Applicable End Date	Applicable Value	Duration Years	Procurement Method	Panel Arrangement	Confidentiality Contract Flag	Confidentiality Outputs Flag	Consultancy Flag	Supplier Suburb	Supplier Postcode	Supplier State	Supplier Country	Supplier ABN Exempt	Office Postcode	predicted clusters	predicted clusters by Kmeans
2019-08-20	2019-05-01	2019-05-31	16163.40	0.222222	Limited tender	No	No	No	No	BEENLEIGH	4207	QLD	AUSTRALIA	No	2021	-1	4
2020-05-25	2020-05-25	2023-06-30	648000.00	3.097222	Open tender	Yes	No	No	No	Pennant Hills	1715	NSW	AUSTRALIA	No	2617	-1	2
2020-04-07	2020-03-19	2020-03-27	155997.60	0.027778	Open tender	Yes	No	No	No	QVB Post Office Sydney	1230	NSW	AUSTRALIA	No	2900	-1	4
2019-12-19	2020-01-02	2020-06-30	169542.12	0.530556	Open tender	Yes	No	No	No	NORTH SYDNEY	2060	NSW	AUSTRALIA	No	2606	-1	4
2019-07-25	2019-06-01	2019-07-31	13263.55	0.016667	Limited tender	No	No	No	No	SYDNEY	2000	NSW	AUSTRALIA	No	4000	-1	5

References

- https://towardsdatascience.com/visualizing-data-at-the-zip-code-level-with-folium-d07ac983db20
- https://www.datacamp.com/community/tutorials/wordcloud-python