CASE STUDY

Report on

Designing a Matchmaking System for Startups and Investors

Contents

Task Statement

The task is to design a match making strategy that can connect startups with the most suitable investors.

I aim to answer the following questions:

- Given the startup and investor data, how an investor can find a startup which best suits their interests to invest their money

- A story telling strategy on how a startup best suits their interests and on what attributes common to the investor.

- A visually appealing charts to understand the numbers or the scores on startups

- Allowing system for the room for the improvement by including feedback rating from the users

Background and Significance

I created a sample investor and startup data, by understanding the key factors of the startup would showcase in a deal and what all factors an investor would consider before putting their money in. I leveraged the data model from the Attio CRM and created a sample record of data to design the system. In my data model, I defined attributes and used it to create a match making strategy. The main key fields which I considered while designing this system are:

Investor wise data

- Investor group name
- Domain – in which investor group planning to invest their money
- Fund Availability of investor group
- Risk Appetite
- Past portfolio of investor group

Startup wise data

- Investor company name
- Domain of the startup
- Sector in which the idea of startup falls under
- Deal – Fund startup is looking for from an investor
- Risk Assessment of the startup's idea
- Growth potential of the start-up
- Return on investment per year
- Investment stage

Main Idea

The main idea behind the match making strategy is assigning a score for each attribute in such a way that system can evaluate a startup and investor and assign scores and rank the startups for the investors. The class InvestorMatcher has the scoring system logic. The scoring system typically based on the four attributes.

- Domain match (20 %)
- Sector match (20 %)
- Fund availability match (30 %)
- Risk appetite match (30 %)

This scoring system is based on the assumptions these can be modified, and attributes can be added more to build a complex scoring system.

Algorithm and Score calculation

The matching algorithm takes each investor attributes and compares with the startup's attributes and assigns score to each attribute based on the weight allocation. The cumulative score will be assigned to startup, and final suggestion shows the highest-ranking startups which are suitable for the investors to invest in and why the startup suits. The method find_matches implemented under the class InvestorMatcher defines this algorithm.

The algorithm checks for the domain match and assigns score of 100 if a match found otherwise 0. The sector match is a crucial attribute in which both the investors and startup's attributes are considered, here scoring happens based on the similarities found in the sectors investors interested in and the startup's sector. Here I am leveraging the past portfolio of the investors to get multiple startups in the consideration. The fund availability match is considered to calculate score, startup which have deal which are lesser than the investor groups fund available are considered in the score calculation. Finally, the risk assessment of the investor according to the risk appetite and startups risk capabilities a score will be given. The cumulative of all these scores are assigned to each startup and ranking as high, low, and medium compatibility.

User Interface

The system is built in a Stream Lit package to showcase the visualization and to get a visually appealing story telling application. In stream lit for investor wise selection and startup wise selection two options are given. For Investors two preference options are given

1. Preference by value – Investor can input their value

2. Preference by attribute – Investor can select which attributes they want to consider in startup selection.

The match results are showcased in two formats

1. Original matches
2. Feedback adjusted matches

To get more insights from the two-match results percentage comparison is shown, additionally user feedback section is included allowing system for continuous improvement. The Interactive Visualization Charts are shown in separate tab along with the dynamic interpretation of results.

Feedback System

Users are given with thumbs up/down option to review the match results. Depending on the reviews, system adjusts the score for further prediction.

Areas for Improvement

I made the robust system in such a way any improvement for the system can be incorporated easily. Few improvements which I thought of

- Incorporating Machine learning models or Deep learning models to enhance the recommendation
- Implementing user authentication and role-based access control

Conclusion

To conclude, I have created a scalable matchmaking system by following proper coding standards like object-oriented programming, proper usage of data structures like Data frames, Arrays, Lists, Hash Maps. The visualization of various charts of the matches and data models created in the Attio CRM showcasing the ability to communicate the complex relationships between the investors and startups. I have implemented the feature of dynamically improving the match scores to mimic the real-world data.

References

Pandas operations

- https://pandas.pydata.org/docs/reference/api/pandas.DataFrame.html

Basic list and array operations

- https://docs.python.org/3/tutorial/datastructures.html#list-comprehensions

Data Models and Dictionaries

- https://docs.python.org/3/reference/datamodel.html#data-model

Plotly graphs

- https://plotly.com/python/heatmaps/
- https://plotly.com/python/radar-chart/
- https://plotly.com/python/bubble-charts/

Startup Frameworks

- https://www.valuer.ai/blog/the-most-effective-way-to-validate-new-business-investment-opportunities
- https://www.brex.com/journal/startup-valuation
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