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Insurance Recommendation System

Guide: N. SWAPNA GOUD (Assistant Professor)

B. BHUVANESHWARI, GAYATRI DEEPTHI Y., K. KEERTHANA
Department of CSE
Anurag Group of Institutions

Abstract:- There is a need for a suitable tool to help people select the right insurance plan because there is a great amount of information about insurance on the internet. By creating a recommendation engine that directly provides a product to its clients, the insurance industry has found a lot of value. Several insurance firms provide various insurance policies. Customers are now unable to decide on a plan because of this. Our invention is creating a suggestion system that is especially tailored for the user. Due to their special characteristics, insurance plans require a different approach than traditional systems. These algorithms often use enormous databases to construct them and aim to suggest the best offer. Our system employs the collaborative filtering technique to determine how likely it is for a user to obtain an insurance plan based on user similarity taking into account their preferences. The usage of recommendation tools is widespread, but little has been done for the insurance sector. Our system uses this technique for insurance suggestions in an effort to close that gap.

I. INTRODUCTION

Global purpose. In this paper, we describe a mechanism for recommending the best insurance plan at the appropriate time to enhance the client experience. Machine learning algorithms have become widely accepted in recent years, enabling professionals in a wide range of fields to obtain cutting-edge insights on consumer behaviour and fine - tune their marketing plans accordingly. Within the framework of recommendation systems, algorithms like this automatically generate individualised prospects for each customer.

Common uses for recommendation engines. The creation of internet apps with recommendation algorithms is an increasing trend. In an effort to make consumers' decision-making processes easier and reduce the stress that comes from having too many options, they provide a variety of things that people frequently use (such online marketplaces and video streaming services). On well-known websites like Amazon and Netflix, customers quickly lose interest and leave the site when presented with hundreds or thousands of possibilities. In order to give your clientele the best service possible, it is imperative to establish a strong system of recommendations.

II. EXISTING SYSTEM

A fresh strategy is required because the unique qualities of insurance products are not well-suited to current online platform-based recommendation methods (e.g., e-commerce, movies). These algorithms, which were created with the aid of sizable databases, are in charge of recommending the best course of action. A Bayesian network-based system created for insurance brokers to give recommendations for any type of insurance is offered by the authors of one of the few academic articles that deal with recommendation systems connected to insurance.

A. Disadvantages of existing system:

- Based on the insurance provider with whom it has a partnership, it suggests a particular insurance plan.
- It is not able to conduct efficient data analysis.
- An incorrect interpretation of user behaviour or a failure to adjust to novel circumstances.
- The current system is a generic system, so insurance recommendations may not be tailored to the client's needs.

III. PROPOSED SYSTEM

The proposed system employs the collaborative filtering technique to determine the best insurance plan for the user based on the choices of other similar users. Insurance plans are offered by various businesses. This system does not favor one business over another.

This project's aim is to create a system that predicts a user's likelihood of obtaining a specific insurance plan based on similarities with other users. It gives the user access to a collaborative filtering technique that generates accurate and unbiased recommendations.

IV. METHODOLOGY

The dataset of insurance policies is first loaded into the system. The data is then pre-processed by removing characteristics with only one class and data with a high correlation. The system then employs a collaborative filtering method to make an insurance policy suggestion to a consumer. This method known as collaborative filtering excludes items that a user would find appealing based on the views of other users who share their interests. It works by scanning a large group of individuals and identifying a smaller group of users who have preferences similar to a specific user. The model takes user-indexed customer data and suggests an appropriate policy to the customer. By doing so, this system intends to provide a quick and simple way for purchasing insurance policies.

In the implementation of this model, collaborative filtering was used to assist customers in finding a suitable insurance policy.

V. EXPERIMENTAL TOOLS

A. OS

In order to communicate with the operating system, Python's OS module offers various methods. The Python standard utility tools include OS. Using operating system-dependent features can be done portably with the help of this module. The *os* and *os.path* modules have a wide range of file system-related operations.

B. Numpy

A versatile package for handling arrays is called Numpy. In addition to tools for dealing with these arrays, it offers a high-performance multidimensional array object.

It serves as Python's foundational module for scientific computing. It has a number of characteristics, notable ones among them being:

- An effective N-dimensional array object
- Complex (broadcasting) functions
- Effective linear algebra, Fourier transform, and random number skills.
- Tools for integrating C/C++ and Fortran code.

Numpy has a variety of applications outside of science, including effective multi-dimensional data storage. Because Numpy can define arbitrary data-types, it can quickly and easily integrate with a broad range of databases.

C. Pandas

Using its potent data structures, Pandas, an open-source Python library, offers high-performance data transformation and analysis tools.

Python was primarily used for data processing and munging. It did not make much of an impact on data processing. Pandas figured out the solution. Regardless of the source of the data load, we can complete the five standard stages of data processing and analysis using Pandas: prepare, manipulate, model, and analyze.

Python and Pandas are used in a variety of academic and professional areas, such as finance, economics, statistics, analytics, etc.

D. Matplotlib

A Python 2D plotting tool called Matplotlib creates publication-quality graphics in a range of physical formats and in cross-platform interactive settings. Four graphical user interface toolkits, the Python and IPython shells, the Jupyter Notebook, online application servers, and Python scripts can all make use of Matplotlib. Matplotlib aims to make difficult things feasible and simple things easy. With just a few lines of code, you can create graphs, histograms, power spectra, bar charts, error charts, scatter plots, and more.

The pyplot package offers a MATLAB-like interface for basic plotting, especially when used with IPython. A collection of MATLAB-friendly functions or an object-oriented interface give power users complete control over things like line styles, font properties, axes properties, and more.

E. Seaborn

Seaborn is a fantastic Python visualization tool for statistical graphics plotting. It includes attractive preset styles and colour palettes to make statistical plots more appealing. It is designed on top of the matplotlib library and is tightly integrated with pandas data structures.

With Seaborn, graphics will be at the heart of data exploration and comprehension. In order to better comprehend the dataset, it offers dataset-oriented APIs that allow us to switch between various visual representations of the same variables.

VI. OUTPUT

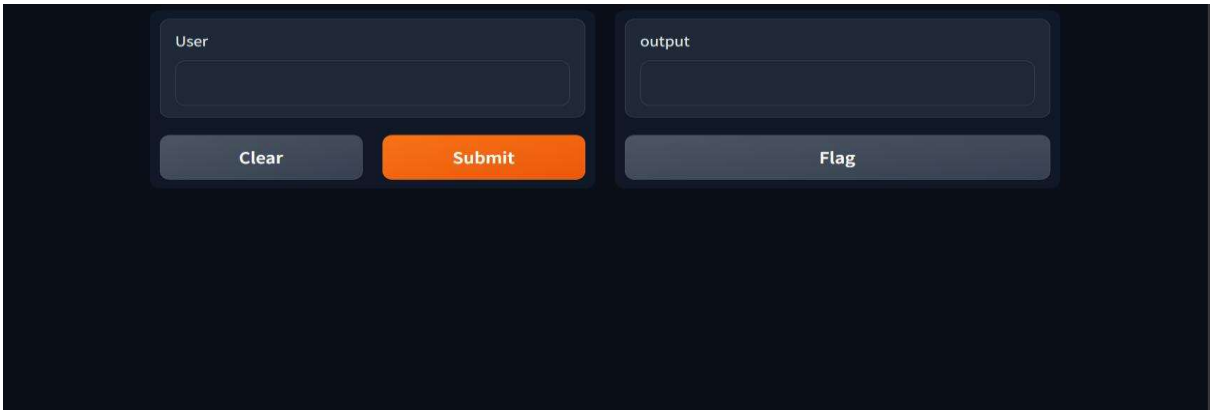

Fig. 1: User Interface

The user interface contains an input field and an output field along with three buttons - clear, submit and flag. It takes the user index as input and displays the list of plans as output in the output field.

Fig. 2: Accept input and display output

A random user index (65) is given as input and the system displays the list of plans along with their respective weightages as output in the output field.

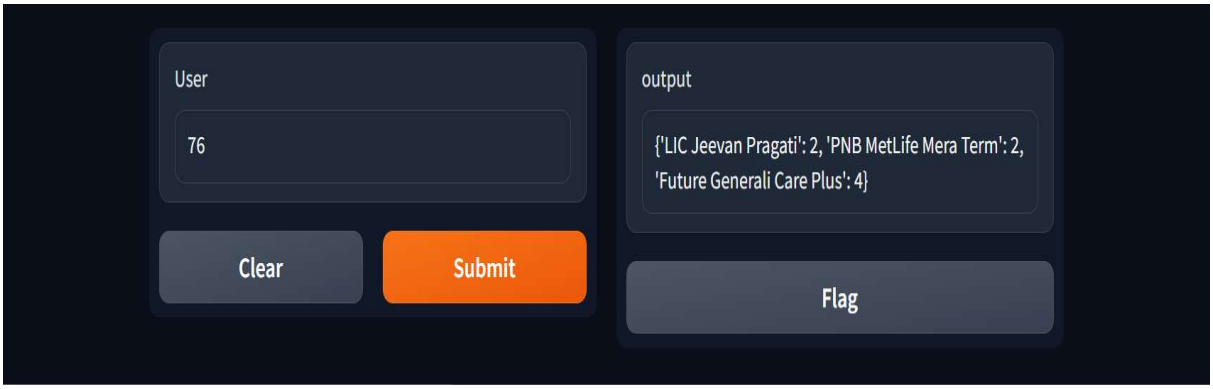

Fig. 3: Accept input and display output)

A second different user index (76) is given as input and the system displays a different list of plans along with their respective weightages as output in the output field.

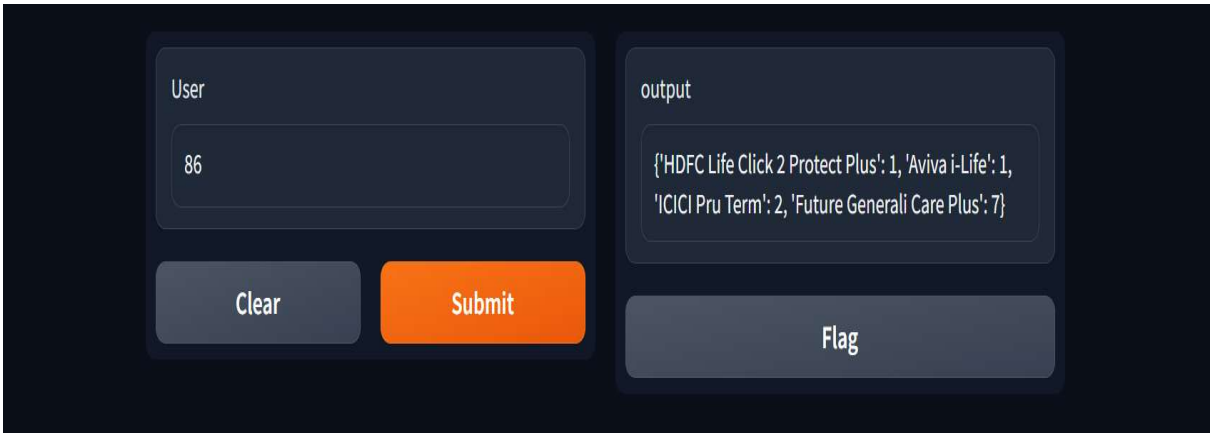

Fig. 4: Accept input and display output)

A third different user index (86) is given as input and the system displays a different list of plans along with their respective weightages as output in the output field.

VII. CONCLUSION

This is a recommendation model for insurance policies in this project. To find similar users, our system uses the collaborative filtering method. It compares the insurance plans selected by the majority of similar users. The finest insurance policy is then prioritized. It then suggests a selection of plans with their associated weightages. These weightages show the likelihood of the user selecting a plan. Based on comparable users, this recommendation model assists users in deciding which plan to choose.This project overall simplifies the process of the recommendation of appropriate insurance policies to the user. Users can easily access the system and get a recommendation.

REFERENCES

[1.] Yi Tan and Guo-Ji Zhang, "The application of machine learning algorithm in underwriting process," 2005 International Conference on Machine Learning and Cybernetics, Guangzhou, China, 2005, pp. 3523-3527 Vol. 6. doi: 10.1109/ICMLC.2005.1527552

[2.] J. Ben Schafer, Dan Frankowski, Jon Herlocker, and Shilad Sen, "Collaborative Filtering Recommender Systems," P. Brusilovsky, A. Kobsa, and W. Nejdl (Eds.): The Adaptive Web, LNCS 4321, 2007, pp. 291 – 324, 2007. https://doi.org/10.1007/978-3-540-72079-9_9

[3.] Seo, Kwang-Kyu, "Development of Personalized Insurance Product Recommendation Systems based on Artificial Neural Networks," Journal of the Korea Safety Management & Science, Volume 10 Issue 4, Pages.309-314, 2008, 1229-6783(pISSN), 2288-1484(eISSN).

[4.] Kumar, P., Singh, D. (2011). Integrating Data Mining and AHP for Life Insurance Product Recommendation. In: Das, V.V., Thankachan, N. (eds) Computational Intelligence and Information Technology. CIIT 2011. Communications in Computer and Information Science, vol 250. Springer, Berlin, Heidelberg. https://doi.org/10.1007/978-3-642-25734-6_103

[5.] Abdhesh Gupta and Anwiti Jain. "Life Insurance Recommender System Based on Association Rule Mining and Dual Clustering Method for Solving Cold-Start Problem." (2013), International Journal of Advanced Research in Computer Science and Software Engineering, Volume 3, Issue 10.

[6.] Xu, Wei, Wang, Jiajia, Zhao, Ziqi, Sun, Caihong and Ma, Jian. "A Novel Intelligence Recommendation Model for Insurance Products with Consumer Segmentation" Journal of Systems Science and Information 2, no. 1 (2014): 16-28. https://doi.org/10.1515/JSSI-2014-001

[7.] Assad Abbas, Kashif Bilal, Limin Zhang, Samee U. Khan, "A cloud based health insurance plan recommendation system: A user centered approach,

[8.] Future Generation Computer Systems," Volumes 43–44, 2015, Pages 99-109, ISSN 0167-739X, https://doi.org/10.1016/j.future.2014.08.010.

[9.] Sumit Das, Aritra Dey.et.al., "Applications of Artificial Intelligence in Machine Learning: Review and Prospect", International Journal of computer applications,vol 15, issue 9, April 2015, pp. 31-39

[10.] N. Gluhih, I. Y. Karyakin and L. V. Sizova, "Recommender system providing recommendations for unidentified users of a commercial website," 2016 IEEE 10th International Conference on Application of Information and Communication Technologies (AICT), Baku, 2016, pp. 1-3. doi: 10.1109/ICAICT.2016.7991724 Department of ISE, SDMCET, Dharwad.

[11.] Akshay Hinduja and Manju Pandey, Multicriteria Recommender System for Life Insurance Plans based on Utility Theory, Indian Journal of Science and Technology, DOI:10.17485/ijst/2017/v10i14/111376, 2017, Volume: 10, Issue: 14.

[12.] Maleeha Qazi, Glenn Fung, Katie J. Meissner and Eduardo R. Fonte, An Insurance Recommendation System Using Bayesian Network. Conference Paper, August 2017. DOI:10.1145/3109859.3109907.

[13.] Khalili-Damghani, Kaveh & Abdi, Farshid & Abolmakarem, Shaghayegh. (2018). "Solving customer insurance coverage recommendation problem using a two-stage clustering-classification mode.". International Journal of Management Science and Engineering Management, pp. 9-19, DOI:10.1080/17509653.2018.1467801.

[14.] Y. Guo, Y. Zhou, X. Hu and W. Cheng, "Research on Recommendation of Insurance Products Based on Random Forest," 2019 International Conference on Machine Learning, Big Data and Business Intelligence (MLBDBI), Taiyuan, China, 2019, pp. 308-311, doi: 10.1109/MLBDBI48998.2019.00069.

[15.] Maleeha Qazi, Kaya Tollas, Teja Kanchinadam, Anthem INC Joseph Bockhors. "Designing and deploying insurance recommender systems using machine learning," Wiley. t. July 2020 Wiley Interdisciplinary Reviews: Data Mining and Knowledge Discovery 10(4). DOI:10.1002/widm.1363.

[16.] Parasrampuria, Rohan & Ghosh, Ayan & Dutta, Suchandra & Sarkar, Dhrubasish. "Recommending Insurance products by using Users' Sentiments," 2021, https://doi.org/10.48550/arXiv.2108.06210.