**MKT 568 -Assignment 4**

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**Due: March 15th, 4:59 pm**

**Scoring: 12 points total or 6% of your grade+ 2% extra credit points**

**QUESTION A:**

1. (2 points) (references are at the end of the doc)

People have defined the recommender systems differently due to different contents and backgrounds. Here are the majority of the recommender systems we found from internet: Collaborative Recommender system, Content-based recommender system, Demographic based recommender system, Utility based recommender system, Knowledge based recommender system and Hybrid recommender system (BluePi, 2015; Techlabs, 2021). The most commonly used recommendation systems are content-based and collaborative filtering methods.

1. (2 points) (references are at the end of the doc)

The Barnes and Nobles could consider collaborative filler algorithms and content-based approaches. They are:

Collaborative Filtering Using k-Nearest Neighbors (kNN), user-user collaborative filtering, item-item collaborative filtering (Doshi, 2019), and collaborative filtering using matrix factorization (Li, 2017; Rocca, 2019).

Content-based regression or classification models, such as item-centred Bayesian classifier and user-centred linear regression (Rocca, 2019).

1. (2 points) (references are at the end of the doc)

To build a recommender system for Barnes and Nobles, we need at least ratings data (the data that users give ratings to books, including userID, bookID, and bookRating), book data (including bookID, ISBN, book title, book author, publisher, publish year, book description, and so on), users data (the data of user demographic information, including userID, location, gender, browser history, purchase history, and age) (Li, 2017), and book sale data (the sale records of books, including sale numbers, top 10 best sellers, best sellers for each category, best sellers in new books, classic book best sellers, and so on)

**QUESTION B:**

1. Snapshots of process and results.

The stream interface:

A picture containing diagram

Description automatically generated

Classification trees

KNN

Logistics regression

Partition node:

Graphical user interface

Description automatically generated

Input variables:

Table

Description automatically generated

Logistic regression:

Table

Description automatically generated

Table

Description automatically generated

Classification tree:

1. Classification and Regression (C&R)

Diagram

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1. C5.0

Diagram

Description automatically generated with low confidenceTable

Description automatically generated

1. Chi-square Automatic Interaction Detector (CHAID)

Diagram

Description automatically generatedTable

Description automatically generated

1. QUEST

Diagram

Description automatically generatedTable

Description automatically generated

K-NN

Graphical user interface, application, Word

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Table

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1. (8 points)

The KNN performed better in predicting the class for the records in the test set. Because comparing to the logistic regression (86.64%) and classification tree (86.39%), the accuracy rate of test set of KNN is higher (89.91%). Also, the training set accuracy rate (90.21%) and test set of KNN (89.91%) have no big differences, which means the data perform well and accurate under KNN algorithm.

The results from Modeler and Excel calculations to support the answer:

Logistic regression classification evaluation metrics:

Table

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Classification tree classification evaluation metrics: C&R, C5.0, CHAID, and QUEST have the same results

Table

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KNN classification evaluation metrics:

Table

Description automatically generatedTable

Description automatically generated

**REFERENCES**

BluePi. (2015). *Classifying Different Types of Recommender Systems*. Retrieved 03/14 from <https://www.bluepiit.com/blog/classifying-recommender-systems/>

Doshi, S. (2019). *Brief on Recommender Systems: Different types of recommendation methods used in industries.* Medium.com. Retrieved 03/14 from <https://towardsdatascience.com/brief-on-recommender-systems-b86a1068a4dd>

Li, S. (2017). *Building A Book Recommender System – The Basics, kNN and Matrix Factorization*. DataSciencePlus. Retrieved 03/14 from <https://datascienceplus.com/building-a-book-recommender-system-the-basics-knn-and-matrix-factorization/>

Rocca, B. (2019). *Introduction to recommender systems: Overview of some major recommendation algorithms.* Mudium.com. Retrieved 03/14 from <https://towardsdatascience.com/introduction-to-recommender-systems-6c66cf15ada>

Techlabs, M. (2021). *Types of Recommendation Systems & Their Use Cases*. Medium.com. Retrieved 03/14 from <https://medium.com/mlearning-ai/what-are-the-types-of-recommendation-systems-3487cbafa7c9>