

**CDS513: Predictive Business Analytics**  
Academic Session: Semester 2, 2022/2023  
School of Computer Sciences, USM, Penang

**ASSIGNMENT 1**

**Task Type**

Assignment 1 is an **individual** assignment.

**Assignment Description**

The students are required to select one of the listed problems/data sets in **Appendix A** and propose the solution to the problem by performing **Recommender Systems**.

**Name of Dataset Selection:** See *Appendix A*.

*Note: You may come out with suitable scenarios and assumptions as deemed necessary. For a topic with more than one dataset, you are required to understand the relationship between the files and perform necessary action to come out with relevant information.*

A recommender system is a subclass of systems that seeks to predict the "rating" or "preference" a user would give to an item. It estimates a utility function that automatically predicts how a user will like an item, based on past behaviour, relation to other users, item similarity and context.

1. Perform the Recommender Systems.

Perform all three (3) recommender systems. Your recommender systems should be based on the topic chosen.

Perform the necessary analysis have taught and discussed in the class. You are also strongly encouraged to do research to add value to your analysis. The analysis should reflect the real world's scenario application.

- a. The Collaborative Filtering System:
  - i. Model-based (as in the lab)

OR

Memory-based (similarity measure)

- User-to-User CF
- Item-to-Item CF

- b. The Content-based System.
- c. Calculate AUC, precision and mean average precision for all the recommender systems.

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2. Perform Analysis on Recommender Systems (RS):
  - a. Select certain items for focus and analyse the pattern and impact.
  - b. Do some research on how to visualize the results. Do not forget to cite the reference/s.

Note: You may repeat the experiments with different options to get the optimal recommender systems.

**Report Format**

- A project report must be prepared using Microsoft Word, font type Arial, size 12, single space.
- A **cover page** should contains course name (including semester and year), Assignment 1, topic title, matrix no and name.
- Group contribution page that indicates name of the members and task handled.
- Table of Contents
  - 1.0 Project Background
    - Background of the problem domain
    - Description of the problem
  - 2.0 Data Understanding & Integration\*
  - 3.0 Recommender Systems
  - 4.0 Discussion & Analysis

*Note:*

*\*Data Understanding & Integration may include:*

- *Data description and visualization, understanding of the data distribution of the data etc.*
- *Integration – process of split or merging the data from original dataset, as well as the assumption regarding the dataset you deal with.*
- Summit your assignment report (minimum 5 pages, maximum of 20 pages, PDF document file).
- Your report should include the snap short of the process and output.

**Report Submission Instruction**

- Submit soft copy to eLearn@USM.
- The zip package must be named according to the following notation: CDS513\_Assignment1\_MatricNo\_TopicNo. For example, the zip package is named as **CDS513\_Assignment1\_111111/111222\_T01**.

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**Assignment Evaluation**

This assignment will be graded (A to F scale).

IMPORTANT: Students who copied or plagiarized other's work or let their work be copied or plagiarized will be given an F grade. The student may be barred from sitting for final exam and reported to the university's disciplinary board.

**Grading Rubric – Assignment 1**

Course Learning Outcome (CLO):

- CLO2 Design strategies relevant to predictive business analytics using appropriate technologies and tools.
- CLO3 Assess the role of predictive business analytics in enhancing business performance.
- CLO5 Evaluate predictive business analytics using recent tools.

**Rubrics**

Component	2-1 (Poor)	5-3 (Average)	8-6 (Good)	10-9 (Excellent)	Weight
Intro & Problem Background	Introduction and problem background are <b>poorly</b> explained.	Introduction and problem background are <b>fairly</b> explained.	Introduction and problem background are <b>adequately</b> explained.	Introduction and problem background are <b>clearly</b> explained.	10%
Data Understanding & Integration	Data Understanding & Integration are <b>poorly</b> explained.	Data Understanding & Integration are <b>fairly</b> explained.	Data Understanding & Integration are <b>adequately</b> explained.	Data Understanding & Integration are <b>clearly</b> explained.	15%
Discussion & Analysis	The results are <b>poorly</b> discussed and tailored to the problem addressed. Insights from the analysis are discussed and <b>poorly</b> explained.	The results are <b>fairly</b> discussed and tailored to the problem addressed. Insights from the analysis are discussed and <b>minimally</b> explained.	The results are <b>adequately</b> discussed and tailored to the problem addressed. Insights from the analysis are discussed and	The results are <b>clearly</b> discussed and tailored to the problem addressed. Insights from the analysis are discussed	15%

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			<b>adequately</b> explained.	and well- explained.	
Recommender Systems	RS is <b>poorly</b> performed.	RS is <b>fairly</b> performed.	RS is <b>adequately</b> performed.	RS is <b>successfully</b> performed.	35%
Analysis of RS	Analysis of RS is <b>poorly</b> analysed.	Analysis of RS is <b>fairly</b> analysed.	Analysis of RS is <b>adequately</b> analysed.	Analysis of RS is <b>clearly</b> analysed.	20%
Application of RS	The application of RS is <b>poorly</b> written and justified.	The application of RS is <b>fairly</b> written and justified.	The application of RS is <b>adequately</b> written and justified.	The application of RS is <b>clearly</b> written and justified.	5%