Data Mining

Midterm Project

Dr. Jason T.L. Wang, Professor

Department of Computer Science

New Jersey Institute of Technology

Submission Rules

- Submit ONE SINGLE file. Embed your last name and first name in your project file name. For example, if your name is John Smith, your file name should read: smith_john_midtermproj.doc. Only doc or pdf file is accepted. No tar/zip/rar is allowed.
- Your project will automatically lose **10** points if the above submission rules are violated.
- This is a single person project.
- Put your first name, last name, NJIT UCID, and email address on the first page of your project file (otherwise you will lose points).
- Submit your project file in Canvas under Midterm Project Submission Site before the deadline.
- **NO LATE PROJECT IS ACCEPTED.** Submit your project to Canvas before the deadline even if it is not complete. If it is not complete, on the first page of the project, provide a note to indicate what you have completed and what is missing. All projects emailed to me or TA will be ignored.

Midterm Project – Part 1

Create 30 items usually seen in Amazon, K-mart, or any other supermarkets (e.g. diapers, clothes, etc.).

(1) Create a database of 20 transactions each containing some of these items. The information can be stored in a file, or a DBMS (e.g. ORACLE).

(2) Repeat (1) by creating 4 additional, different databases each containing 20 transactions.

Using Apriori, generate and print out all the association rules and the input transactions for each of the 5 transaction databases you created (support and confidence should be user-determined parameter values, so the output should show different support and confidence values).

Midterm Project – Part 2

- Implement the brute force method and compare the brute force method with the Apriori algorithm on each of the 5 transaction databases you created. Present computation (CPU or clock) time to demonstrate that the Apriori algorithm is faster than the brute force method on each of the 5 transaction databases. The brute force method and Apriori algorithm should output the same association rules on each database.

- The brute force method for finding frequent itemsets works as follows. Enumerate and generate all possible 1-itemsets and 2-itemsets. There are 30 items, so there are 435 possible 2-itemsets totally. Check to see whether each possible 1-itemset/2-itemset is frequent. Then enumerate and generate all possible 3-itemsets. There are 4060 possible 3-itemsets totally. Check to see whether each possible 3-itemset is frequent. Keep on doing so until you see none of the possible k-itemsets is frequent for some k, at which point the brute force method terminates without generating (k+1)-itemsets.

Platforms are open

- Programming language is open; any one of the following is allowed: C, C++, C#, Java, R, Matlab, Perl, Python, Php, visual studio, PL/SQL, etc. Use any programming language of your choice (specify the programming language you use in the project).
- Operating system is open; any one of the following is allowed: Windows, Solaris Unix, Linux, Mac OS, etc.
- Hardware is open; any one of the following is allowed: PC, Laptop, Sun Sparc, etc.

Project Grading

- There is a limit on the file size in Canvas. So, keep your project file small to avoid any problem that may occur when submitting the file in Canvas.
- The project file should contain the source code and documentation including **screenshots**. The screenshots are used to demonstrate the running situation of your program, particularly how the program executes and produces output based on different input data and user-specified parameter values.