CSE488

List of Possible Tasks based on the Course Advising Dataset

This is just an idea of the different analyses you could do based on this dataset. You may include your ideas.

Based on your findings, you should prepare a report and a brief presentation (duration: 6-8 minutes). You will earn extra points if you can build a Dashboard.

Descriptive Analytics

1. **Frequency Analysis**:
   - Find the frequency of individual courses from C1 to C7.
   - Identify the most and least popular courses.
2. **Pattern Analysis**:
   - Identify the most frequent combinations of courses taken together (pairs, triples, etc.).
   - Find the average number of courses taken by a student.
3. **Statistical Measures**:
   - Calculate mean, median, and mode for numerical columns like `CreditsCompleted`, `takencredit`, and `takennocourse`.
   - Find correlations between `CreditsCompleted` and `takencredit`.

Visualization Tasks

4. **Course Popularity**:
   - Create a bar chart to show the frequency of each course, pairs, triples based on the frequency analysis.
5. **Combination Patterns**:
   - Use a heatmap or chord diagram to visualize the relationships between courses frequently taken together.
6. **Credits Distribution**:
   - Plot a histogram for the distribution of `CreditsCompleted` and `takencredit`.
7. **Course Co-occurrence**:
   - Create a network graph to display courses that are frequently taken together.

Predictive Analytics

8. **Association Rule Mining**:
    - Use algorithms like Apriori to generate association rules and find confidence/support for course combinations (pairs, triples and so on).
9. **Clustering**:
    - Group students based on the courses they take (e.g., using K-means or hierarchical clustering).

Advanced Analytics

10. **Recommendation System**:
    - Design a simple recommender system for students to suggest courses based on previously taken courses.
11. **Comparison**:
    - Compare the course-taking behavior of students who have taken more than 50 credits vs. those who have taken fewer.

Creative and Open-Ended Projects

12. **Student Profiles**:
    - Create visual profiles for students based on their `CreditsCompleted`, `takencredit`, and course combinations.
13. **Custom Dashboards**:
    - Build an interactive dashboard using tools like Tableau, Power BI, or Python libraries (Plotly/Dash).

Documentation and Presentation

14. **Storytelling with Data**:
    - Prepare a presentation that tells a story about the course-taking behavior of students. Also, include necessary details in the report.