1. List the members of your group below. Underline your name.

2. Prove or disprove: Bag intersection may be expressed using bag union and difference.

3. Provide formal definitions of each of the bag algebra operators: selection, projection, cross product, union, difference.
4. Provide expressions for the minimum and maximum cardinalities of the result of each of the operators of Question 3 as a function of the cardinalities of its operands. Justify your answers.
5. Consider a database with relations \textbf{Students}(id, name, year), \textbf{Courses}(id, title, ta), and \textbf{Enrolls}(student, course, credits). A tuple \((i, n, y) \in \text{Students}\) denotes a student with student-identifier \(i\), name \(n\), and year \(y\). A tuple \((i, t, a) \in \text{Courses}\) denotes a course with course-identifier \(i\), title \(t\), and whose teaching assistant’s student-identifier is \(a\). A tuple \((s, c, r) \in \text{Enrolls}\) denotes the enrollment of the student with identifier \(s\) in the class with identifier \(c\), for \(r\) credits.

We say student \(t\) is a TA of student \(s\), for \(r\) credits, if \(s\) is enrolled for \(r\) credits in a course whose TA is \(t\). We say a TA \(t\) is responsible for \(r\) credits if \(r\) is the sum of credits of all student enrollments in all courses whose TA is \(t\).

Write a SQL statement to create a view that provides the names and IDs of the TAs who are the TAs of the maximum number of students for \(r\) credits, for each distinct value of \(r\) occurring in the database.
6. Write an extended algebra query that is equivalent to the query of Question 5.