Assignment1: Popular Course Combinations

Problem Description

At your university, students often enroll in multiple courses. The registrar's office wants to determine how many distinct popular course combinations exist. A popular course combination is defined as any two different students who are enrolled in at least one course in common.

Given a list of students and the courses they are enrolled in, determine the total number of distinct student pairs who share at least one course.

Input Format

1. The first line contains a single integer $n < 10^5$ representing the number of students.
2. Each of the next n lines contains the student's name followed by the courses they are enrolled in. Each student's record is formatted as:

   Name Course1 Course2 ... CourseM

   - Names consist of uppercase letters and are unique.
   - Course names consist of uppercase letters with numbers.
   - Each student is enrolled in at least one course and at most 20 courses.

Constraints

- Use at least one advanced data structure: **HashMap**, **HashSet**, **TreeSet**, **TreeMap**, or **PriorityQueue**.

Output Format

3. Output a single integer, the total number of distinct student pairs who share at least one course.

Sample Input (1)

5
ALICE CS101 MATH101
BOB CS101
CHARLIE PHYS101 MATH101
DAVID CS101 PHYS101
EVE MATH101

Sample Output (1)

7

Explanation

The following student pairs share at least one course:

1. ALICE and BOB (CS101)
2. ALICE and CHARLIE (MATH101)
3. ALICE and DAVID (CS101)
4. ALCE and EVE (MATH101)
5. BOB and DAVID (CS101)
6. CHARLIE and DAVID (PHYS101)
7. CHARLIE and EVE (MATH101)

Sample Input (2)

1
ALICE CS101 MATH101 PHYS101

Sample Output (2)

0

NOTE: Make sure to test your program with multiple inputs as there will be hidden test cases that we will be using to grade your program

IMPORTANT: Test your program thoroughly on **Eustis** before submission. Programs that do not compile or execute correctly on Eustis will not be eligible for credit.

Implementation Requirements

- Write clean, modular code with proper comments and variable names – follow the style guide posted with the assignment