

Problem Statement: University Student & Event Management System

The university wants a software system to **manage students**, their **participation in various events**, and **their performance/results** in a single program. The system should be able to:

Register Students

Each student has: roll number, name, age, and contact info (phone, email).

Students can participate in multiple events (cultural, sports, and technical).

(Hint: Think about whether to use structs, arrays, or nested structs to store all info.)

Store Event Information

Each event has a name, type, maximum marks, and score obtained by each participant.

(Hint: Should each event have a separate array, or should it be part of the student record? Could enums help for event type?)

Record Performance

For each student, track marks for every event.

Students may only have one type of score per event (either sports score OR cultural score).

(Hint: Consider a union to save memory if only one score per event is stored.)

d) Operations to Perform

Add new students and event details.

Compute total marks, average, and grade for each student.

Rank students by total marks.

Search for a student by roll number.

Print a leaderboard with student names, total marks, and grades.

(Hint: Functions for modularity; arrays for multiple students; loops for traversal.)

e) String Operations

Names and event names should allow operations like concatenation, reverse, and comparison.

(Hint: Use string functions or character arrays.)

f) Dynamic Decisions

Decide how to organize students and event data efficiently.

Decide which data types to use for marks, scores, and grades.

Decide where to use typedef, enum, or union.