Problem Statement:

CodeKeep is a platform designed to help competitive programmers manage and track their competitive programming profiles and upcoming contests. The platform enables users to store their achievements across multiple competitive programming sites, view upcoming contests in a unified calendar, and monitor their progress in various competitions. The system will store information related to users, contests, platforms, and user participation in contests. Additionally, users will be able to link multiple profiles from different platforms to their account.

Entities and Subgroups:

1. **USER** – Represents an individual who participates in competitive programming contests.
   o Subgroup 1: **Personal Information**
      ▪ `user_id` (Primary Key)
      ▪ `name`
      ▪ `email`
   o Subgroup 2: **Competitive Profiles**
      ▪ `user_profiles` (Multivalued Attribute) – Multiple links to competitive programming profiles across different platforms.
2. **CONTEST** – Represents an upcoming programming contest. Each contest has a date, platform, and other relevant details.
   o Subgroup 1: **Contest Details**
      ▪ `contest_id` (Primary Key)
      ▪ `contest_name`
      ▪ `contest_date`
      ▪ `contest_start`
      ▪ `duration`
      ▪ `derived: contest_end`
   o Subgroup 2: **Platform Information**
      ▪ `platform_id` (Foreign Key to PLATFORM)
3. **PLATFORM** – Represents a competitive programming platform where contests are hosted.
   o Subgroup 1: **Platform Information**
      ▪ `platform_id` (Primary Key)
      ▪ `platform_name`
      ▪ `website_url`
4. **PROBLEMS** – Represents a user's involvement in a contest. It tracks a user's rank and score in each contest they participate in.
   o Subgroup 1: Problem Information
      ▪ `problem_id` (Primary Key)
      ▪ difficult score
      ▪ platform_key(fk)

Multivalued Attribute:

- **USER** has a multivalued attribute:
   o `user_profiles` – Stores multiple links to competitive programming profiles on various platforms (e.g., Codeforces, LeetCode, AtCoder, etc.).

Relationships:

- **USER** can have many **PARTICIPATION** records, as they can participate in multiple contests.
- **CONTEST** can have many **PARTICIPATION** records, as multiple users can participate in the same contest.
- Each **CONTEST** is hosted by a **PLATFORM**, so there is a one-to-many relationship between **PLATFORM** and **CONTEST**.

- **USER** can link multiple profiles (as a multivalued attribute), so a user can have many associated profiles from different platforms, which may be stored separately.