

Milestone I Project: Codeforces

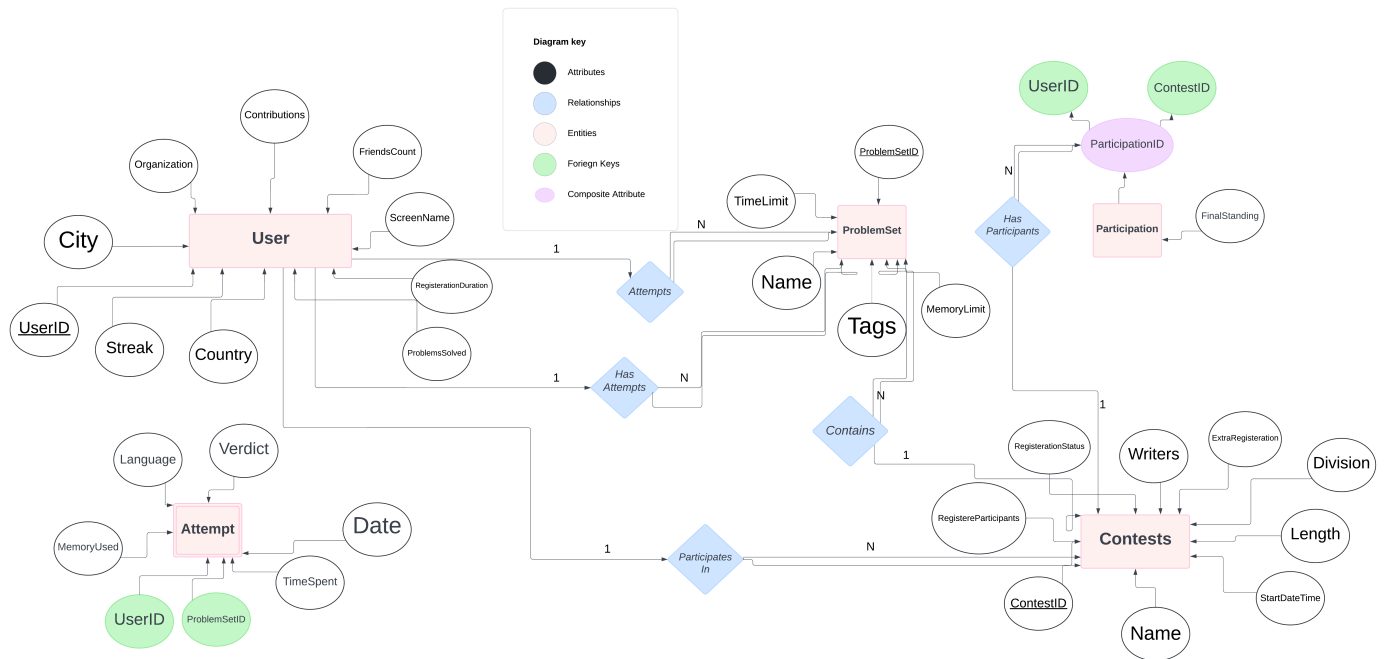
Fundamentals of Database Systems (CSCE 2501)

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Entity-Relationship Diagram (ERD)

Below is the ERD representing the structure of the database system, including the relationships between entities such as contests, problem sets, users, and attempts. Please check the **Diagram key** for reference.



Relational Model

- **Contest** (ContestID, Name, Date, Division, *Writers*, RegisteredParticipants, FinalStanding)
- **ProblemSet** (ProblemSetID, Name, Tags, TimeLimit, MemoryLimit)
- **User** (UserID, ScreenName, City, Country, Organization, Contributions, FriendsCount, RegistrationDuration, ProblemsSolved, Streaks)
- **Attempt** (AttemptID, *UserID*, *ProblemID*, Date, Verdict, Language, TimeSpent, MemoryUsed)
- **Participation** (ParticipationID, *UserID*, *ContestID*, FinalStanding)

Please note that underlined keys are **Primary Keys (PK)**, and *Italic* keys are **Foreign Keys (FK)**.

SQL Code Transcript

Below is the SQL code used to create the database and the schema.

```
1 CREATE DATABASE IF NOT EXISTS codeforces_db;
2 USE codeforces_db;
3 -- Contest table
4 CREATE TABLE IF NOT EXISTS Contest (
5     ContestID INT PRIMARY KEY,
6     Name_ VARCHAR(255) NOT NULL,
7     Date_ DATETIME NOT NULL,
8     Division VARCHAR(100),
9     Writers VARCHAR(255),
10    RegisteredParticipants INT,
11    FinalStanding INT
12 );
13
14 -- ProblemSet table
15 CREATE TABLE IF NOT EXISTS ProblemSet (
16     ProblemSetID INT PRIMARY KEY,
17     Name_ VARCHAR(255) NOT NULL,
18     Tags VARCHAR(255),
19     TimeLimit INT,
20     MemoryLimit INT
21 );
22
23 -- User table
24 CREATE TABLE IF NOT EXISTS User_ (
25     UserID INT PRIMARY KEY,
26     ScreenName VARCHAR(255) NOT NULL,
27     City VARCHAR(100),
28     Country VARCHAR(100),
29     Organization_ VARCHAR(255),
30     Contributions INT,
31     FriendsCount INT,
32     RegistrationDuration INT,
33     ProblemsSolved INT,
34     Streaks INT
35 );
36
37 -- Attempt table
38 CREATE TABLE IF NOT EXISTS Attempt (
39     AttemptID INT PRIMARY KEY,
40     UserID INT,
41     ProblemID INT,
42     Date_ DATETIME NOT NULL,
43     Verdict CHAR(8) NOT NULL CHECK (Verdict IN ('Accepted', 'Rejected')), -- Verdict Accepted
44     or Rejected
45     Language_ VARCHAR(100),
46     TimeSpent INT,
47     MemoryUsed INT,
48     FOREIGN KEY (UserID) REFERENCES User_(UserID),
49     FOREIGN KEY (ProblemSetID) REFERENCES ProblemSet(ProblemSetID)
50 );
51
52 -- Participation table
53 CREATE TABLE IF NOT EXISTS Participation (
54     ParticipationID INT PRIMARY KEY,
55     UserID INT,
56     ContestID INT,
57     FinalStanding INT,
58     FOREIGN KEY (UserID) REFERENCES User_(UserID),
59     FOREIGN KEY (ContestID) REFERENCES Contest(ContestID)
60 );
```