

Database Normalization:

Functional Dependencies:

User:

{ID} -> {name, dob, phone, email, belt, password}

The ID determines the name, dob, phone, email, belt, password of each user

Instructor:

{ID} -> {specialization, years_experience}

The ID determines the specialization and years of experience of an instructor

Student:

{ID} -> {points, skill_level}

The ID determines points and skill level of each student

Guardian:

{student_ID, name} -> {phone, email, relationship}

The student_ID and name determines a guardian's phone, email and relationship to a student

Activity:

{name} -> {deadline, description, url, user_ID, class_ID}

The name of the activity determines all other attributes

Class:

{ID} -> {name, age_group, skill_level, time, num_students, num_instructors}

The ID of a class determines all the other attributes

ActivityVideo:

{activity_name, student_ID, timestamp} -> {url}

An activity's name, a student_ID and a timestamp determine the url to a video

Favourite:

{instructor_ID, activity_name} -> {student_ID}

An instructor's ID and an activity name determine a student's ID

Vote:

{voter_ID, activity_name} -> {votee_ID}

The voter's ID and name of an activity determine the votee's ID

Normalized Schema:

All of the functional dependencies are already in the form:

primary key -> non-prime attributes

This means that the database is in 3NF and BCNF already.

Relations:

User [ID, name, dob, phone, email, belt, password]

Instructor [ID, specialization, years_experience]

Student [ID, points, skill_level, votee_ID]

Guardian [student_ID, name, phone, email, relationship]

Activity [name, deadline, description, user_ID]

Class [ID, age_group, skill_level, time, num_students, num_instructors]

ActivityVideo [activity_name, student_ID, timestamp, url]

BelongsTo [student_ID, class_ID]

Teaches [instructor_ID, class_ID]

Favourite [instructor_ID, activity_name, student_ID]

Vote [voter_ID, activity_name, votee_ID]

Foreign Keys:

Instructor.ID references User.ID

Student.ID references User.ID

Student.votee_ID references Student.ID

Guardian.student_ID references Student.ID

Activity.user_ID references User.ID

ActivityVideo.activity_name references Activity.name

ActivityVideo.student_ID references Student.ID

BelongsTo.student_ID references Student.ID

BelongsTo.class_ID references Class.ID

Teaches.instructor_ID references Instructor.ID

Teaches.class_ID references Class.ID

Favourite.instructor_ID references Instructor.ID

Favourite.activity_name references Activity.name

Vote.voter_ID references Student.ID

Vote.activity_name references Activity.name