

**Database Systems**

**Lab No.7**

**Submitted By**

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**Submitted To:**

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**Task 1:**

**Solution:**

**Table: Students**

* **Primary Key: StudentID**
  + It uniquely identifies each student in the Students table. No two students should have the same StudentID that is why it is the primary key.
* **Foreign Key: CourseID**
  + It links the Students table to the Courses table. Each student is assigned to a course, and CourseID references the primary key of the Courses table.
* **Candidate Key: Email**
  + Email could also uniquely identify a student, making it a valid candidate to serve as a primary key if needed. However, it's not chosen as the primary key here.
* **Super Key: StudentID, (StudentID, Email)**
  + StudentID alone is a super key since it uniquely identifies a student. Combining StudentID and Email still uniquely identifies each student, so this combination can also be called a super key.
* **Unique Key: Email**
  + The Email field is unique because no two students should have the same email address. Hence making it a unique key.
* **Alternate Key: Email**
  + Since StudentID is the primary key. The other unique identifier Email becomes an alternate key.

**Table: Courses**

* **Primary Key: CourseID**
  + CourseID uniquely identifies each course in the Courses table. Every course has a different CourseID.
* **Candidate Key: CourseName**
  + CourseName could be a candidate key if each course has a unique name, but course names might not always be unique.
* **Super Key: CourseID, (CourseID, CourseName)**
  + CourseID alone is a super key. We could also combine it with other attributes like CourseName, but that’s unnecessary since CourseID alone is enough to uniquely identify a course.
* **Foreign Key: InstructorID**
  + InstructorID in the Courses table links it to the Instructors table, where InstructorID is the primary key. It indicates which instructor teaches which course.

**Table: Instructors**

* **Primary Key: InstructorID**
  + InstructorID uniquely identifies each instructor. Every instructor has a different InstructorID.
* **Candidate Key: Email**
  + Email could also uniquely identify an instructor. It can serve as a candidate key because no two instructors should have the same email address.
* **Super Key: InstructorID, (InstructorID, Email)**
  + InstructorID is a super key since it uniquely identifies each instructor. Combining InstructorID with other fields like Email still uniquely identifies each instructor. So this combination is also a super key.
* **Unique Key: Email**
  + The Email of each instructor should be unique, ensuring no two instructors have the same email address.
* **Alternate Key: Email**
  + Since InstructorID is chosen as the primary key, Email becomes an alternate key because it could also serve as a unique identifier.