**Zafra kazmi**

**Sap 56030**

**DB lab 07**

5. Task: Identify the Keys: Primary Key, Foreign Key, Composite Key, Candidate Key, Super Key, Unique Key and alternate keys. For each key identified, students should write a brief explanation of why the key fits the definition

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| StudentID | FirstName | LastName | Email | CourseID | CourseName | InstructorID | InstructorName |
| 1 | Zafra | Kazmi | Zk05@gmail.com | 001 | Family life | 110 | Mam Sadia |
| 2 | khizra | Noor | Kn24@gmail.com | 002 | Oop | 112 | Mam Sabahat |
| 3 | Zainab | Shahzad | Zaini78@gmail.com | 003 | Data Base | 114 | Mam Hafsa |
| 4 | Eman | Fatima | Eman14@gmail.com | 004 | DLD | 115 | Mam Sidra |
| 5 | Fatima | Noor | Fatm10@gmail.com | 005 | COAL | 116 | Mam Anum |

**Primary Key**

* StudentID

**Reasoning**: StudentID is unique for each student and cannot be NULL, making it a primary key.

* CourseID

**Reasoning**: CourseID is unique for each course and cannot be NULL, fulfilling the primary key role.

* InstructorID

**Reasoning**: InstructorID is unique and cannot be NULL, making it a valid primary key.

**Foreign Key**

* CourseID

**Reasoning**: CourseID in the Students table refers to CourseID in the Courses table, linking students to courses. It can be NULL if a student is not assigned to a course.

* InstructorID

**Reasoning**: InstructorID in the Courses table refers to InstructorID in the Instructors table, linking courses to instructors. An instructor can teach multiple courses, but each course has one instructor.

**Composite Key**

* None

**Candidate Key**

* StudentID&Email

**Reasoning**: StudentID is the primary key, but Email is also unique, so it could also be a candidate key.

* CourseID&CourseName

**Reasoning**: CourseID is the primary key, but CourseName is also unique, so it could be a candidate key.

* InstructorID&Email

**Reasoning**: InstructorID is the primary key, but Email is unique, making it a candidate key as well.

**Super Key**

* StudentID&Email

**Reasoning**: Adding Email to StudentID makes it a super key, even though StudentID alone is enough to uniquely identify a student.

* CourseID&CourseName

**Reasoning**: Even though CourseID alone is enough, adding CourseName and InstructorID would still uniquely identify a course, making it a super key.

* InstructorID&Email

**Reasoning**: Adding Email to InstructorID makes it a super key, even though InstructorID alone is sufficient

**Unique Key**

* Email

**Reasoning**: Email can be unique for each student, but unlike a primary key, it can allow NULL values.

* CourseName

**Reasoning**: CourseName can be unique, ensuring no two courses have the same name, but it can allow NULL values.

**Alternate key**

* Email

**Reasoning**: Email is a candidate key, but since StudentID is the primary key, Email becomes an alternate key.

* CourseName

**Reasoning**: CourseName is a candidate key, but since CourseID is chosen as the primary key, CourseName becomes an alternate key.