# Topic : Keys and schema diagram

prepared by
Md . Al-Amin
ID:066

## Why we need keys in database system ?

To uniquely identify the tuple in a table.

Some important key are given below:

1. Super key
2. Candidate key
3. Primary key
4. Alternate key
5. Foreign key

# Super key:

- ☆ Like superset.
- ☆ Uniquely identify the tuple.
- ☆ NULL values.
- ☆ {Name} is not a super key.
- ☆ May contain extraneous attributes.
- ☆ Superkeys:

  {ID}, {SSN}, {ID, Name},
  {ID, SSN}, {ID, Phone},
  {Name, Phone}, {ID, Email},
  {Name, SSN, Phone},
  {Name, Email},
  {ID, SSN, Phone} . . . . .

Employee

| ID | Name | SSN | Salary | Phone | Email |
|---|---|---|---|---|---|
| 101 | John | AA | 50000 | 12 | j@sw |
| 102 | Robin | BB | 60000 | 13 | r@yh |
| 103 | Alya | CC | 35000 | 14 | a@hm |
| 104 | Yusuf | DD | 68000 | 15 | y@ch |
| 105 | John | EE | 62000 | 89 | j@in |
| 106 | Raj | FF | 45000 | 87 | r@au |
| 107 | Jayant | GG | 25000 | 45 | j@us |
| 108 | John | HH | 35000 | 15 | j@de |
| 109 | Neil | II | 25000 | 12 | n@uk |

# Candidate key:

- ☆ Superkeys:

  {ID}, {SSN}, {ID, Name},
  {ID, SSN}, {ID, Phone},
  {Name, Phone}, {ID, Email},
  {Name, SSN, Phone},
  {Name, Email},
  {ID, SSN, Phone} . . . . .

- ☆ Minimal super keys are called candidate keys.

- ☆ Candidate Keys:

  {ID}, {SSN}, {Name, Phone},
  {Email}

Employee

| ID | Name | SSN | Salary | Phone | Email |
|---|---|---|---|---|---|
| 101 | John | AA | 50000 | 12 | j@sw |
| 102 | Robin | BB | 60000 | 13 | r@yh |
| 103 | Alya | CC | 35000 | 14 | a@hm |
| 104 | Yusuf | DD | 68000 | 15 | y@ch |
| 105 | John | EE | 62000 | 89 | j@in |
| 106 | Raj | FF | 45000 | 87 | r@au |
| 107 | Jayant | GG | 25000 | 45 | j@us |
| 108 | John | HH | 35000 | 15 | j@de |
| 109 | Neil | II | 25000 | 12 | n@uk |

## Primary key:

Candidate Keys:

{ID}, {SSN}, {Name, Phone},

{Email}

Primary Key: {ID}

Employee

| ID | Name | SSN | Salary | Phone | Email |
|---|---|---|---|---|---|
| 101 | John | AA | 50000 | 12 | j@sw |
| 102 | Robin | BB | 60000 | 13 | r@yh |
| 103 | Alya | CC | 35000 | 14 | a@hm |
| 104 | Yusuf | DD | 68000 | 15 | y@ch |
| 105 | John | EE | 62000 | 89 | j@in |
| 106 | Raj | FF | 45000 | 87 | r@au |
| 107 | Jayant | GG | 25000 | 45 | j@us |
| 108 | John | HH | 35000 | 15 | j@de |
| 109 | Neil | II | 25000 | 12 | n@uk |

# Foreign key:

Student

| S_ID | Name | Dept_Code | Credits |
|---|---|---|---|
| 101 | John | 101 | 12 |
| 102 | Robin | 102 | 14 |
| 103 | Alya | 103 | 20 |
| 104 | Yusuf | 104 | 10 |

Dept

| Dept_Code | Dept_Name |
|---|---|
| 101 | CSE |
| 102 | EEE |
| 103 | ECE |
| 104 | MECH |

# Schema diagram : The logical design of database

Here is some table :

Instructor (ID, Name, Dept_Name, Salary)

Course (Course_ID, Title, Dept_Name, Credits)

Department (Dept_Name, Building, Budget)

Section (Course_ID, Sec_ID, Semester, Year, Building, Room_No, Time_slot_ID)

Teaches (ID, Course_ID, Sec_ID, Semester, Year)

Student (ID, Name, Dept_Name, Tot_Cred)

Advisor (S_ID, I_ID)

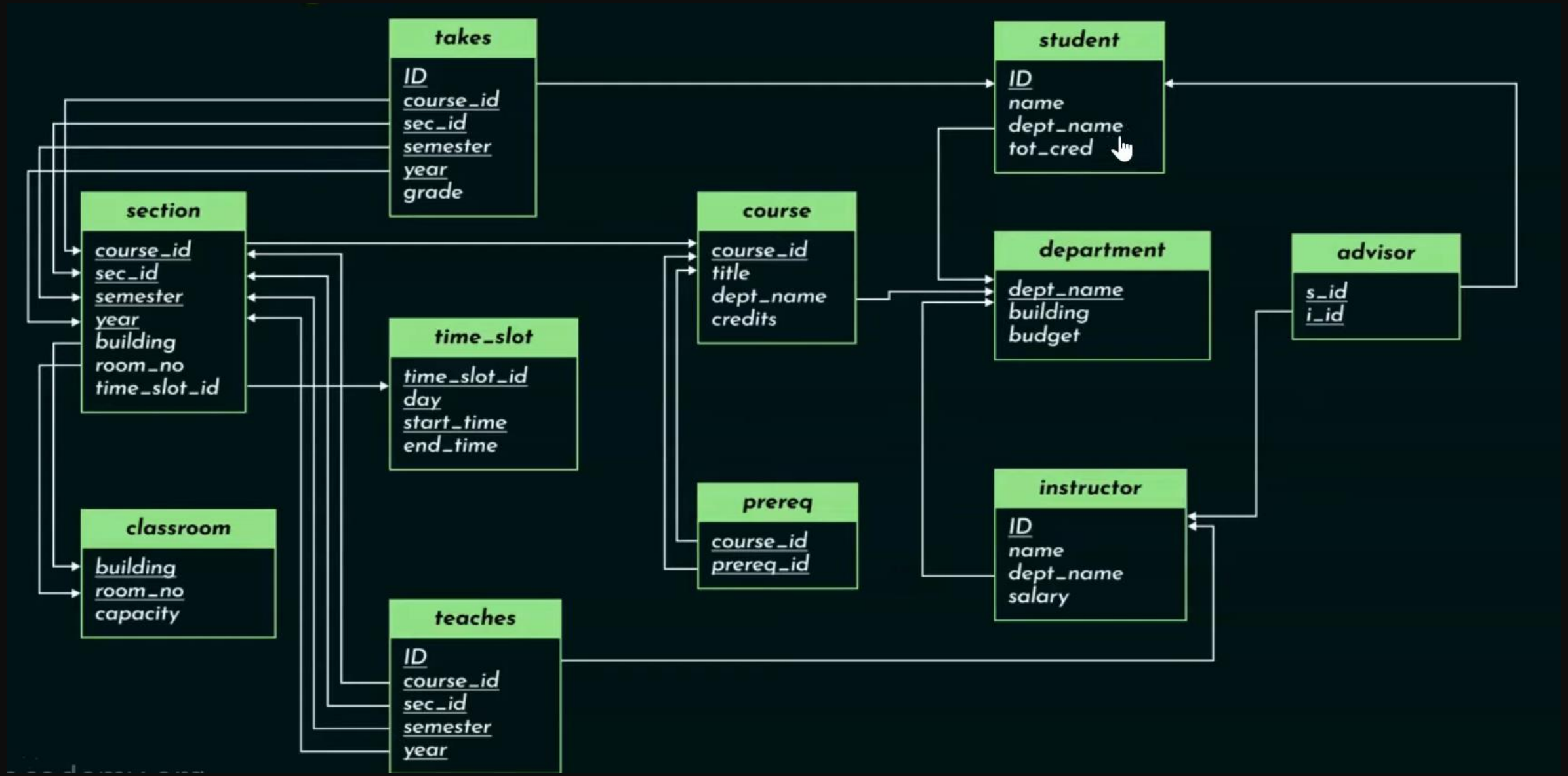
Takes (ID, Course_ID, Sec_ID, Semester, Year, Grade)

Classroom (Building, Room_Number, Capacity)

Time_Slot (Time_Slot_ID, Day, Start_Time, End_Time)

# Schema diagram : The logical design of database

Here is the design :



Thank you all.....