

Project Group:

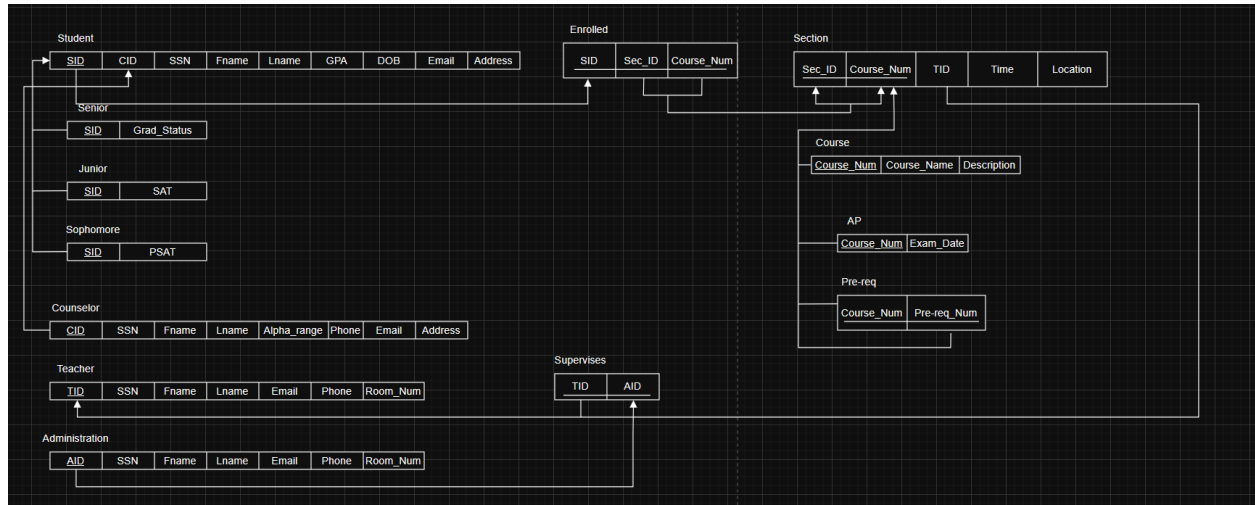
- Project name: Registrar's Spreadsheet
- Team name: Team #8
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Phase 3, Task A**Description:**

The Relational Schema submitted for Phase 2 is already in third normal form. However, the student subclasses (Freshman, Sophomore, Junior, Senior) have many spurious, or redundant, copies of attributes such as GPA, Fname, Name, SSN, DOB, Email, and Address. This issue occurs for the Course subclasses as well. Therefore, we will remove those spurious attributes from the subclasses only. This will require that the Freshman relation be removed, because it has no unique non-redundant. In addition, we will correct that for relation Section, attributes Sec_ID and Course_num are together the primary key. The correction is done on relations Enrolled, Pre-req, and Supervises as well. These corrections will allow the relational schema to be in third normal form.

Changes:

- Remove redundant (spurious) attributes from Student subclasses
 - Remove the Freshman relation entirely for this reason
- PK(Enrolled) = {SID, SEC_ID, Course_Num}
- PK(Section) = {Sec_ID, Course_Num}
- Remove Course subclasses On-Level and Honors, because they only contribute redundant (spurious) attributes
- PK(Pre-req) = {Course_Num, Pre-Req_Num}
- PK(Supervises) = {Course_Num, Pre-Req_Num}



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Functional Dependencies:

Student(SID, CID, SSN, Fname, Name, DPA, DOB, Email, Address)

- PK = {SID}
- FDs:
SID → CID, SSN, Fname, Name, GPA, DOB, Email, Address
- 3NF: All other attributes depend only on the PK SID

Senior(SID, Grad_Status)

- PK = {SID}
- FDs:
SID → Grad_Status
- 3NF: Only other attribute Grad_Status depends only on PK SID

Junior(SID, SAT)

- PK = {SID}
- FDs:
SID → SAT
- 3NF: Only other attribute SAT depends only on PK SID

Sophomore(SID, PSAT)

- PK = {SID}
- FDs:
SID → PSAT
- 3NF: Only other attribute PSAT depends only on PK SID

Counselor(CID, SSN, Fname, Name, Alpha_range, Phone, Email, Address)

- PK = {CID}
- FDs:
CID → SSN, Fname, Name, Alpha_range, Phone, Email, Address
- 3NF: All other attributes depend only on PK CID

Teacher(TID, SSN, Fname, Name, Email, Phone, Room_Num)

- PK = {TID}
- FDs:

TID→SSN, Fname, Name, Email, Phone, Room_Num

- 3NF: All other attributes depend only on PK TID

Administration(AID, SSN, Fname, Name, Email, Phone, Room_Num)

- PK = {AID}
- FDs:
TID→SSN, Fname, Name, Email, Phone, Room_Num
- 3NF: All other attributes depend only on PK AID

Enrolled(SID, Sec_ID, Course_Num)

- PK = {SID, Sec_ID, Course_Num}
- FDs:
(SID, Sec_ID, Course_Num)→∅
- 3NF: The relation is made up only of the primary key

Supervises(TID, AID)

- PK = {TID, AID}
- FDs:
(TID, AID)→∅
- 3NF: The relation is made up only of the primary key

Section(Sec_ID, Course_Num, TID, Time, Location)

- PK = {Sec_ID, Course_Num}
- FDs:
(Sec_ID, Course_Num)→Time, Location
- 3NF: All other attributes depend only on the entire primary key (Sec_ID, Course_Num)

Course(Course_Num, Course_Name, Exam_Date)

- PK = {Course_Num}
- FDs:
Course_Num→Course_Name, Exam_Date
- 3NF: All other attributes depend only on the primary key Course_Num

AP(Course_Num, Exam_Date)

- PK = {Course_Num}
- FDs:
Course_Num→Exam_Date
- 3NF: Only other attribute Exam_Date depends only on the primary key Course_Num

Pre-req(Course_Num, Pre-req_Num)

- PK = {Course_Num, Pre-req_Num}
- FDs:
(Course_Num, Pre-req_Num)→∅
- 3NF: The relation is made up only of the primary key