Kyle Wang

Tue Doan

HW4 Write Up

1. For our database we will have six schemas. These six schemas will be:
    - Student(SID, surname, prefername, email)
    - StudentStatus(SID, term, major, class, level)
    - EnrolledIn(SID, CID, term, seat, units, grade, status, numbergrade)
    - CourseOffered(CID, term, section, crse, instructor, subject)
    - Course(crse, subject, maxunits, minunits)
    - Meetsat(CID, term, room, build, day, time, type)

    We chose to have student schema contain SID, surname, prefername, and email. SID is the key, because we assumed that surname, prefername, and email does not change over time. That is why a SID can always determine these attributes regardless of the term. When inserting our SIDs into our database, to prevent inserting duplicate SIDs we keep a dictionary to maintain all the SIDs that have already been inserted. Since level, major, and class can possibly change for each term. We have a StudentStatus as a weak entity connected to our Student relation. StudentStatus will rely on the SID from Student, to be able to determine the major, class, and level for each term.

    Course will have crse, subject, maxunits, and minunits. The keys will be crse and subject. Since we could possibly be inserting multiple courses multiple times with the same key, we have a dictionary in our loading program that recorded all the crse and subject in a dictionary to make sure we don't have duplicate inserts of Course. CourseOffered is a weak entity connected to the Course relation. CourseOffered has attributes CID, term, instructor, and section. Its key will be CID and term, and the two keys, crse and subject, that it takes from Course. We have Course and CourseOffered connected to each other through an isOffered relation that has not attributed. CourseOffered is also connected to another weak entity that is called Meetsat. Meetsat has the attributes time, day, room, build, and type, and, also takes two keys from CID and TERM. This will contain the time and location for each class that was offered.

    There will be an EnrolledIn schema that has the attributes seat, units, grade, and status. EnrolledIn must take the key SID from Student, and CID and term from CourseOffered. This schema will contain the class information of a student that had enrolled in a course for a term.

    When updating our database, insertions will be easy, as any possible duplicate data will be detected by our dictionary. Deletion of data will be more difficult. If we had to delete a student from the database, we would have to delete from the Student,

StudentStatus, and EnrolledIn table. This would be tedious, and would require a lot of deletes in EnrolledIn if the student had taken a lot of courses.

While doing the queries, we decided to add a new attribute to enrolled in, called numbergrade, to make the grade calculation queries easier.

FDs

SID →surname, prefername, email

SID,TERM → Major, class, level

SID,CID,TERM →seat, units, grade, status

CID, TERM,SUBJECT,CRSE →instructor, section

CRSE, SUBJECT →maxunits, minunits

cid,term,time,day,type,room,build → cid,term,Time,day,type,room,build

MVDs

SID →→surname,

SID →→prefername

SID →→email

SID,TERM →→ Major

SID,TERM →→ class

SID,TERM →→ level

SID,CID,TERM →→ seat

SID,CID,TERM →→ units

SID,CID,TERM →→ grade

SID,CID,TERM →→ status

CID, TERM,SUBJECT,CRSE →→ instructor

CID, TERM,SUBJECT,CRSE →→ section

CRSE, SUBJECT →→ maxunits

CRSE, SUBJECT →→ minunits

Queries Results

3a

0.015839 percent of students took 1 units

0.004128 percent of students took 2 units

0.016739 percent of students took 3 units

0.453595 percent of students took 4 units

0.030409 percent of students took 5 units

0.012923 percent of students took 6 units

0.019799 percent of students took 7 units

0.126551 percent of students took 8 units

0.036577 percent of students took 9 units

0.015550 percent of students took 10 units

0.019967 percent of students took 11 units

0.139483 percent of students took 12 units

0.056071 percent of students took 13 units

0.018321 percent of students took 14 units

0.009911 percent of students took 15 units

0.013727 percent of students took 16 units

0.007381 percent of students took 17 units

0.001582 percent of students took 18 units

0.000900 percent of students took 19 units

0.000546 percent of students took 20 units

3b

3.587813 is the average gpa for people taking 1 units

3.546748 is the average gpa for people taking 2 units

3.498997 is the average gpa for people taking 3 units

2.686160 is the average gpa for people taking 4 units

2.719343 is the average gpa for people taking 5 units

3.517949 is the average gpa for people taking 6 units

3.251638 is the average gpa for people taking 7 units

2.869302 is the average gpa for people taking 8 units

2.731938 is the average gpa for people taking 9 units

2.993420 is the average gpa for people taking 10 units

3.120678 is the average gpa for people taking 11 units

2.889565 is the average gpa for people taking 12 units

2.710746 is the average gpa for people taking 13 units

2.788752 is the average gpa for people taking 14 units

2.970177 is the average gpa for people taking 15 units

2.877719 is the average gpa for people taking 16 units

2.837183 is the average gpa for people taking 17 units

2.744107 is the average gpa for people taking 18 units

3.307444 is the average gpa for people taking 19 units

2.629773 is the average gpa for people taking 20 units

3c

Easiest Instructors

('O"donnell, Madison G.', 3.95)

('Russo, Angel J.', 3.95)

('Guerrero, Jackson M.', 3.8375)

('Morris, Ariana O.', 3.83333333333333)

('Walker, Evelyn K.', 3.79090909090909)

Hardest Teachers

('Turner, Emily A.', 1.7)

('Adams, Emily G.', 1.78181818181818)

('Salazar, Mason J.', 1.86173913043478)

('Hurley, Landon A.', 1.99661538461539)

('Erickson, Jorge A.', 2.06393442622951)

3d

Easiest Instructors

('Dodson, Nicole M.', 3.46280193236715)

('Alvarado, Samantha A.', 3.34465408805032)

('Murphy, Melanie S.', 3.25918367346939)

('Morris, Evan E.', 3.24465691788526)

('Baldwin, Ella J.', 3.17547169811321)

Hardest Teachers

('Adams, Emily G.', 1.78181818181818)

('Whitehead, William A.', 1.98373983739837)

('Hurley, Landon A.', 1.99661538461539)

('Johnston, Jayden L.', 1.99825436408978)

('Miller, Emma J.', 2.05322195704057)

3e

3f

Major that performs the best for ABC courses

(4.0, 'O167')

Major that performs the worst for ABC courses

(0.0, 'O263')