Assignment #1 RA

1-Consider the below database schema:

    Professor(ssn, profname, status)
    Course(crscode, crsname, credits)
    Taught(crscode, semester, ssn)

Query1) Return the ssn of professors who have taught 'COMP440'.

RA: $\pi_{ssn}(\sigma_{crscode='COMP440'}(Taught))$

Query: select ssn

  from Taught

  where crscode = 'COMP440'

Query2) Return the ssn of professors who have taught 'COMP440' in 'Spring 2020' semester.

RA: $\pi_{ssn}(\sigma_{crscode='COMP440' \land semester='Spring\ 2020'}(Taught))$

Query: select ssn

  from Taught

  where crscode = 'COMP440' **and** semester = 'Spring2020'

Query3) Return the ssn of professors who have taught both 'COMP440' and 'COMP541'.

RA: $\pi_{ssn}(\sigma_{crscode='COMP440'}(Taught)) \cap \pi_{ssn}(\sigma_{crscode='COMP541'}(Taught))$

Query: select A.ssn

  from Taught A, Taught B

  where A.crscode = 'COMP440' **and** B.crscode = 'COMP541' **and** A.ssn=B.ssn

Query4) Return the codes of courses that have never been taught.

RA: $\pi_{crscode}(\sigma_{crscode}(Course) - \sigma_{crscode}(Taught))$

Query: select crscode

  from Course

  except

select crscode

from Taught

Query5) Return the names of courses that have never been taught.

RA: $\pi_{crsname}(\sigma_{crscode}(Course) - \sigma_{crscode}(Taught))$

Query: select name

    from Course,

    except

    select crscode

    from Taught

Query6) Return the names of professors who ever taught 'COMP440'.

RA: $\pi_{profname}(\sigma_{crscode='COMP440'}(Taught \bowtie_{Taught.ssn=Professor.ssn} Professor))$

Query: select Professor.profname

    from Taught, Professor

    where Taught.ssn=Professor.ssn **and** Taught.crscode = 'COMP440'

Query7) Return the names of full professors who ever taught 'COMP440'.

RA:
$\pi_{profname}(\sigma_{crscode='COMP440' \land status=full}(Professor \bowtie_{Professor.ssn=Taught.ssn} Taught))$

Query: select Professor.profname

    from Professor, Taught

    where Professor.ssn = Taught.ssn **and** Taught.crscode = 'COMP440'

        and Professor.status = full

2- Consider the below database schema:

    Student(id, name, address, status)

    Transcript(studid, crscode, semester, grade)

Query8) Return the names of students and the codes of courses which they got grade A.

RA: $\pi_{name,crscode}(\sigma_{grade \neq A}(Student \bowtie_{Student.id=Transcript.studid} Transcript))$

Query: select Student.name, Transcript.crscode

      from Student, Transcript

      where Student.id=Transcript.id **and** Transcript.grade $\neq$ A

Bonus: There is 10 extra credits if you write an equivalent query for at least four of the above queries (2.5 points each).