**SECTIONS**

| | |
|---|---|
| course# | 🔑 |
| section# | 🔑 |
| teacher# | |
| num_students | |

**ENROLLS**

| | |
|---|---|
| course# | 🔑 |
| section# | 🔑 |
| student# | 🔑 |
| grade | |

**STUDENTS**

| | |
|---|---|
| student# | 🔑 |
| student_name | |
| address | |
| city | |
| state | |
| zip | |
| sex | |

**TEACHERS**

| | |
|---|---|
| teacher# | 🔑 |
| teacher_name | |
| phone | |
| salary | |

**COURSES**

| | |
|---|---|
| course# | 🔑 |
| course_name | |
| department | |
| num_credits | |

## ENROLLS

| course# | section# | student# | grade |
|--------:|---------:|---------:|------:|
| 730 | 1 | 148 | 3 |
| 450 | 2 | 210 | 3 |
| 730 | 1 | 210 | 1 |
| 290 | 1 | 298 | 3 |
| 480 | 2 | 298 | 3 |
| 730 | 1 | 348 | 2 |
| 290 | 1 | 349 | 4 |
| 480 | 1 | 358 | 4 |
| 480 | 1 | 410 | 2 |
| 450 | 1 | 473 | 2 |
| 730 | 1 | 473 | 3 |
| 480 | 2 | 473 | 0 |
| 290 | 1 | 548 | 2 |
| 730 | 1 | 558 | 3 |
| 730 | 1 | 649 | 4 |
| 480 | 1 | 649 | 4 |
| 450 | 1 | 654 | 4 |
| 450 | 2 | 548 |   |

## TEACHERS

| teacher# | teacher_name | phone | salary |
|---------:|--------------|----------|----------:|
| 303 | Dr. Horn | 257-3049 | 27540.00 |
| 290 | Dr. Lowe | 257-2390 | 31450.00 |
| 430 | Dr. Engle | 256-4621 | 38200.00 |
| 180 | Dr. Cooke | 257-8088 | 29560.00 |
| 560 | Dr. Olsen | 257-8086 | 31778.00 |
| 784 | Dr. Scango | 257-3046 | 32098.00 |

# COURSES

| course# | course_name | department | num_credits |
|---|---|---|---|
| 450 | Western Civilization | History | 3 |
| 730 | Calculus IV | Math | 4 |
| 290 | English Composition | English | 3 |
| 480 | Compiler Writing | Computer Science | 3 |

# SECTIONS

| section# | teacher# | course# | num_students |
|---|---|---|---|
| 1 | 303 | 450 | 2 |
| 1 | 290 | 730 | 6 |
| 1 | 430 | 290 | 3 |
| 1 | 180 | 480 | 3 |
| 2 | 560 | 450 | 2 |
| 2 | 784 | 480 | 2 |

# STUDENTS

| student# | student_name | address | zip | city | state | sex |
|---|---|---|---|---|---|---|
| 148 | Susan Powell | 534 East River Dr. | 19041 | Haverford | PA | F |
| 210 | Bob Dawson | 120 South Jefferson | 02891 | Newport | RI | M |
| 298 | Howard Mansfield | 290 Wynkoop Drive | 22180 | Vienna | VA | M |
| 348 | Susan Pugh | 534 East Hampton Dr. | 06107 | Hartford | CN | F |
| 349 | Joe Adams | 473 Emmerson Street | 19702 | Newark | DE | M |
| 354 | Janet Ladd | 441 10th Street | 18073 | Pennsburg | PA | F |
| 410 | Bill Jones | 120 South Harrison | 92660 | Newport | CA | M |
| 473 | Carol Dean | 983 Park Avenue | 02169 | Boston | MA | F |
| 548 | Allen Thomas | 238 West Ox Road | 60624 | Chicago | IL | M |
| 558 | Val Shipp | 238 Westport Road | 60556 | Chicago | IL | F |
| 649 | John Anderson | 473 Emmory Street | 10008 | New York | NY | M |
| 654 | Janet Thomas | 441 6th Street | 16510 | Erie | PA | F |

# Which Math courses have $3$ or more credits?

```
SELECT course_name, department, num_credits

FROM COURSES

WHERE department = 'Math' AND num_credits >= 3
```

# List the name of all male students who live either in CN or in NY.

```
SELECT student_name

FROM STUDENTS

WHERE (state = 'CN' OR state = 'NY') AND sex = 'M'
```

The parentheses in the WHERE clause are necessary.

# List the names and states of all students who are not from IL

```
SELECT student_name, state

FROM STUDENTS

WHERE state <> 'IL'
```

# List the names and departments of all Math and English courses

```
SELECT course_name, department

FROM COURSES

WHERE department IN ('Math','English')
```

# What is the total salary of all teachers earning more than 30K?

```
SELECT SUM(salary)


FROM TEACHERS


WHERE salary > 30K
```

# List the number of students enrolled in each course

```
SELECT course#, COUNT(*)

FROM ENROLLS

GROUP BY course#
```

# List the average grade and number of courses taken by each student

```
SELECT student#, AVG(grade), COUNT(*)


FROM ENROLLS


GROUP BY student#
```

# List the average grade and number of courses taken by students with an average of more than 2.5

```
SELECT student#, AVG(grade), COUNT(*)


FROM ENROLLS


GROUP BY student#


HAVING AVG(grade) > 2.5
```

# Which teachers teach which courses?

```
SELECT teacher_name, S.teacher#, course#

FROM TEACHERS T, SECTIONS S

WHERE T.teacher# = S.teacher#
```

# What is the enrollment in each section of each course?

```
SELECT section#, course_name, num_students

FROM SECTIONS S, COURSES C

WHERE S.course# = C.course#
```

# Which students from CA or IL got A's or B's?

```
SELECT student_name, state, grade

FROM STUDENTS S, ENROLLS E

WHERE state IN ('CA', 'IL')
      AND (grade = 'A' OR grade = 'B')
      AND S.student# = E.student#
```

# List the names of all teachers, along with the name/numbers of the courses taught by each.

```
SELECT teacher_name, S.course#, course_name

FROM TEACHERS T, SECTIONS S, COURSES C

WHERE T.teacher#=S.teacher#
      AND S.course# = C.course#
```

# In which courses did female students get an A?

```
SELECT student_name, course_name, grade

FROM STUDENTS S, ENROLLS E, COURSES C

WHERE sex = 'F', AND grade = 'A'
       AND S.student# = E.student#
       AND E.course# = C.course#
```

# How many students are in Dr. Smith's Database class?

```
SELECT COUNT(student#)

FROM ENROLLS E, SECTIONS S, TEACHERS T, COURSES C

WHERE teacher_name = 'Smith' AND course_name = 'Database'
        AND E.course# = S.course#
        AND S.teacher# = T.teacher#
        AND S.course# = C.course#
```

# Which students are not enrolled in any courses?

```
SELECT student#, student_name

FROM STUDENTS S

WHERE NOT EXISTS
        (SELECT *
          FROM ENROLLS
          WHERE student# = S.student#)
```