Student(sid, name, addr, age, GPA)

sid	name	addr	age	GPA
301	John	183 Westwood	19	2.1
303	Elaine	301 Wilshire	17	3.9
401	James	183 Westwood	17	3.5
208	Esther	421 Wilshire	20	3.1

Class(dept, cnum, sec, unit, title, instructor)

dept	cnum	sec	unit	title	instructor
CS	112	01	03	Modeling	Dick Muntz
CS	143	01	04	DB Systems	Carlo Zaniolo
EE	143	01	03	Signal	Dick Muntz
ME	183	02	05	Mechanics	Susan Tracey

Enroll(sid, dept, cnum, sec)

sid	dept	cnum	sec
301	CS	112	01
301	CS	143	01
303	EE	143	01
303	CS	112	01
401	CS	112	01

Division

- R: A table when all students take all CS courses

sid	dept	cnum	sec
301	CS	112	01
301	CS	143	01
303	CS	112	01
303	CS	143	01
401	CS	112	01
401	CS	143	01
208	CS	112	01
208	CS	143	01

- R – Enroll:

sid	dept	cnum	sec
303	CS	143	01
401	CS	143	01
208	CS	112	01
208	CS	143	01

Division

- $\pi_{sid}(R - Enroll)$:

sid
303
401
208

- $\pi_{sid}(Student)$:

sid
301
303
401
208

- $\pi_{sid}(Student) - \pi_{sid}(R - Enroll)$:

sid
301

Relational Algebra: Things to Remember

- Data manipulation language (query language)
  - Relation ➔ algebra ➔ Relation
- Relational algebra: set semantics, SQL: bag semantics
- Operators: σ, ⨯, ▷◁, ρ, ∪, −, ∩, ╱
- General suggestion: If difficult to write, consider its complement