

Union, Intersection, Set Difference, Outer Joins

Prof (pid, lname, fname, rank, research)

Dept (did, name, address, *chair*)

(Note *chair* refers to *pid* in Prof)

Appt (pid, did, percentage)

Proj (prid, sponsor, budget, *pid*)

(Note *pid* means PI on Proj)

CoPI (prid, *pid*)

Grad (gid, lname, fname, *major*, *advisor*)

(Note *major* refers to *did* in Dept,
advisor refers to *gid* in Grad)

RA (*gid*, prid, *pid*)

Table names are in bold. Primary keys are underlined. *Foreign keys* are shown in italics and match the same field name in another table unless specified.

1. Union. List professors who are PI or coPI on an NSF grant (prid, pid, lname, label 'PI' or 'CoPI').
2. Set Difference. List professors who are not PI on a grant (pid, lname, fname).
3. Set Difference. List professors who are not PI on a grant from the Wellcome Trust (pid, lname, fname).
4. Intersection. List professors who are PI on both 'NIH' and 'Kidney Foundation' grants (pid, lname, fname).
5. List students who are RA for a project with either Gary Benson or Daniel Segre (gid, lname).
6. List students who are both RAs and Advisors (gid, lname).
7. List all projects that each professor is involved with, whether as PI or coPI in order by professor name (pid, lname, prid, role (1=PI, 2=coPI)). Order by lname ascending and then role descending.
8. For each project, list all the students who are involved with that project as RAs, and their faculty advisor on that project (prid, gid, student lname, pid, professor lname). Order by project id ascending, then student lname ascending. Include projects without RAs.
9. List all projects that are sponsored by the NSF or NIH, but don't have CoPIs (prid, sponsor).