

Module 2: Lab

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Student (sid: integer, sname: string, major: string)

Class (cid: integer, cname: string, cdesc: string)

Enrolled (sid: integer, cid: integer, esemester: string, grade: string) ←

Building (bid: integer, bname: string)

Classrooms (crid: integer, bid: integer, crfloor: integer)

ClassAssigned (cid: integer, crid: integer, casemester: string)

1. Find all the student's names enrolled in CS430dl.

Student.sname ← Enrolled → Class.cname

$\pi_{\text{sname}} (\sigma_{\text{cname} = \text{'CS430dl'}} ((\text{Student} \bowtie \text{Enrolled}) \bowtie \text{Class}))$

2. Find all the classes Hans Solo took in the SP16 semester.

Class ← Enrolled.esemester → Student.sname

$\pi_{\text{cname}} (\sigma_{\text{sname} = \text{'Hans Solo'} \wedge \text{esemester} = \text{'SP16'}} ((\text{Class} \bowtie \text{Enrolled}) \bowtie \text{Student}))$

3. Find all the classrooms on the second floor of building "A".

Classrooms.crfloor ← Building.bname

$\sigma_{\text{bname} = \text{'A'} \wedge \text{crfloor} = 2} (\text{Building} \bowtie \text{Classrooms})$

4. Find all the class names that are located in Classroom 130.

Class.cname ← ClassAssigned ← Classrooms.crid

$\pi_{\text{cname}} (\sigma_{\text{crid} = 130} ((\text{Class} \bowtie \text{ClassAssigned}) \bowtie \text{Classrooms}))$

5. Find all the buildings that have ever had CS430dl in one of their classrooms.

Building.bname ← ClassAssigned ← Class.cname

$\pi_{\text{bid, bname}} (\sigma_{\text{cname} = \text{'CS430dl'}} ((\text{Building} \bowtie \text{Classrooms}) \bowtie (\text{ClassAssigned} \bowtie \text{Class})))$

6. Find all the classrooms that Alice Wonderland has been in.

Classrooms.crid Student.sname
 \uparrow \downarrow
 $\text{ClassAssigned} \leftarrow \text{Enrolled}$
 $\pi_{\text{crid}} (\sigma_{\text{sname} = \text{"Alice Wonderland"}} ($
 $\quad (\text{Student} \bowtie \text{Enrolled}) \bowtie (\text{Classrooms} \bowtie \text{ClassAssigned}))$

7. Find all the students with a CS major that have been in a class in either the "A" building or the "B" building.

Students Building.bname
 $\searrow \text{Enrolled} \rightarrow \text{ClassAssigned} \rightarrow \text{Classrooms}$
 $\pi_{\text{sname}} (\sigma_{(\text{major} = \text{'CS'}) \wedge (\text{bname} = \text{"A"} \vee \text{bname} = \text{"B"})} ($
 $\quad (\text{Student} \bowtie \text{Enrolled}) \bowtie (\text{ClassAssigned} \bowtie (\text{Classrooms} \bowtie \text{Building})))$

8. Find all the classrooms that are in use during the SS21 semester.

Classrooms.crid $\text{Enrolled.esemester}$
 $\quad \quad \quad \swarrow \text{ClassAssigned}$
 $\pi_{\text{crid}} (\sigma_{\text{esemester} = \text{"SS21"}} ((\text{Classrooms} \bowtie \text{ClassAssigned})$
 $\quad \quad \quad \bowtie \text{Enrolled}))$