> Consider the following relational schemas
>
> student(sid, name, age, gender, department,building, room)
>
> dorm (building,room, capacity)
>
> Please write the following queries in relational algebra：

> 1.Find the name of students from“CS” department who lives in dorm “白沙1幢，213”

$\Pi_{name}(\sigma_{building='白沙1幢' \wedge room='213' \wedge department='CS'}(student))$

> 2.Find all roommates of the student whose name is “王小强”.

$\Pi_{A.name}(\sigma_{A.building=B.building \wedge A.room=B.room \wedge A.name \neq '王小强' \wedge B.name='王小强'}(\rho_A(student) \times \rho_B(student)))$

> 3.Find all pairs of students who come from different departments but live in the same dorm.

$\Pi_{A.name,B.name}(\sigma_{A.building=B.building \wedge A.room=B.room \wedge A.sid > B.sid \wedge A.department \neq B.department}(\rho_A(student) \times \rho_B(student)))$

> 4.Find dorms that is fully occupied.

$\Pi_{building,room}(\sigma_{dorm.capacity=A.sum1} dorm \bowtie \rho_A((building, room, sum1)building, room\ \mathcal{G}_{count(*)}(student)))$