Lab #3

a) Find the SIDs of students who attend some course of the first or second class.

$$\Pi_{SID}\left(\left(\left(\sigma_{Class=1} \, Courses\right) \bowtie Gradebook\right) \cup \left(\left(\sigma_{Class=2} \, Courses\right) \bowtie Gradebook\right)\right)$$

b) Find the SIDs of students who attend some course of the first class or have surname Valdez.

$$\Pi_{SID}\left(\left(\left(\sigma_{Class=1} \, Courses\right) \bowtie Gradebook\right) \cup \left(\sigma_{Surname=Valdez} \, Students\right)\right)$$

c) Find the SIDs of students who attend some course of the first and second class.

$$\Pi_{SID}\left(\left(\sigma_{Class=1} \, Courses\right) \bowtie Gradebook\right) \cap \Pi_{SID}\left(\left(\sigma_{Class=2} \, Courses\right) \bowtie Gradebook\right)$$

d) Find the SIDs of students who attend all courses.

$$\Pi_{SID,CID}\left(Gradebook\right) / \Pi_{CID}\left(Courses\right)$$

e) Find the SIDs of students who attend all courses of the third class.

$$\Pi_{SID}\left(\left(\sigma_{Class=3} \, Courses\right) \bowtie Gradebook\right)$$

f) Find pairs of SIDs such that student with the first SID has better grade for some course than the student with the second SID.

$$\rho\left(R_1, \, Gradebook\right)$$

$$\rho\left(R_2, \, Gradebook\right)$$

$$\Pi_{R_1.SID, R_2.SID}\left(\sigma_{R_1.CID=R_2.CID \,\wedge\, R_1.SID \,!=\, R_2.SID \,\wedge\, R_1.Mark > R_2.Mark}\left(R_1 \times R_2\right)\right)$$

g) Find the CIDs of courses attended by at least two different students.

$$\rho\left(R_1, \, Gradebook\right)$$
$$\rho\left(R_2, \, Gradebook\right)$$

$$\Pi_{CID}\left(\sigma_{R_1.CID=R_2.CID \,\wedge\, R_1.SID \,!=\, R_2.SID}\left(R_1 \times R_2\right)\right)$$

a) $\Pi_{Name}\left(\Pi_{SID}\left(\left(\sigma_{Class=2} Courses\right) \bowtie \left(\sigma_{Mark=A \text{ or } Mark=B} Gradebook\right)\right) \bowtie Students\right)$

Name
Warren

b) $\left(\Pi_{Name}\left(\Pi_{SID}\left(\left(\sigma_{Class=1} Courses\right) \bowtie \left(\sigma_{Mark=A \text{ or } Mark=B} Gradebook\right)\right) \bowtie Students\right)\right) \cap$
$\left(\Pi_{Name}\left(\Pi_{SID}\left(\left(\sigma_{Class=2} Courses\right) \bowtie \left(\sigma_{Mark=A \text{ or } Mark=B} Gradebook\right)\right) \bowtie Students\right)\right)$

Name
Warren

c) $\Big(\Pi_{SID}\big(\Pi_{SID}\big((\sigma_{Class=3}Courses) \bowtie (\sigma_{Mark=A\ or\ Mark=C}Gradebook)\big) \bowtie Students\big)\Big) \cap$
$\Big(\Pi_{SID}\big(\Pi_{SID}\big((\sigma_{Class=4}Courses) \bowtie (\sigma_{Mark=A\ or\ Mark=C}Gradebook)\big) \bowtie Students\big)\Big)$

SID

d) $\Pi_{Name}\Big(\big(\Pi_{SID,\ Name}\big((\sigma_{Class=2}Courses) \bowtie (\sigma_{Mark=A\ or\ Mark=B}Gradebook)\big) \bowtie Students\big) \cap$
$\big(\Pi_{SID,\ Name}\big((\sigma_{Class=3}Courses) \bowtie (\sigma_{Mark=A\ or\ Mark=B}Gradebook)\big) \bowtie Students\big)\Big)$

Name