COS 425:
Database and Information
Management Systems

Relational model:
Relational calculus
Correction to example

Board example 3 revisited: Recall for this example we working with:

Acct: (bname, acct#, bal) Branch: (bname, bcity, assets)
Owner: (name, acct#) Customer: (name, street, city)

Want to express in tuple relational calculus
"names of all customers who have accounts at all branches in Princeton"

CORRECTION given 10/9/06:

$\{T \mid \forall B \ \exists O ((B \in Branch \text{ and } B.city = \text{'Princeton'}) \Rightarrow$
$\exists A (A \in Acct \text{ and } O \in Owners \text{ and } A.acct\# = O.acct\# \text{ and}$
$B.bname = A.bname \text{ and } T.name=O.name)) \}$

But if NO branches in Princeton then any tuple *not just any customer name* satisfies!! (**unsafe query!!)**

Solution: put "there exists" up front to force T to be customer name:

$\{T \mid \exists C (C \in Customer \text{ and } T.name = C.name) \text{ and}$
$(\forall B \ \exists O ((B \in Branch \text{ and } B.city = \text{'Princeton'}) \Rightarrow$
$\exists A (A \in Acct \text{ and } O \in Owners \text{ and } A.acct\# = O.acct\# \text{ and}$
$B.bname = A.bname \text{ and } T.name=O.name))) \}$