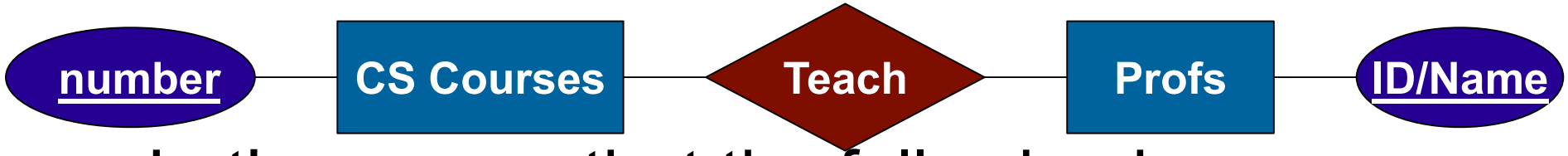
Line annotation example

- Let's focus on a simplified version of "Profs teach courses":

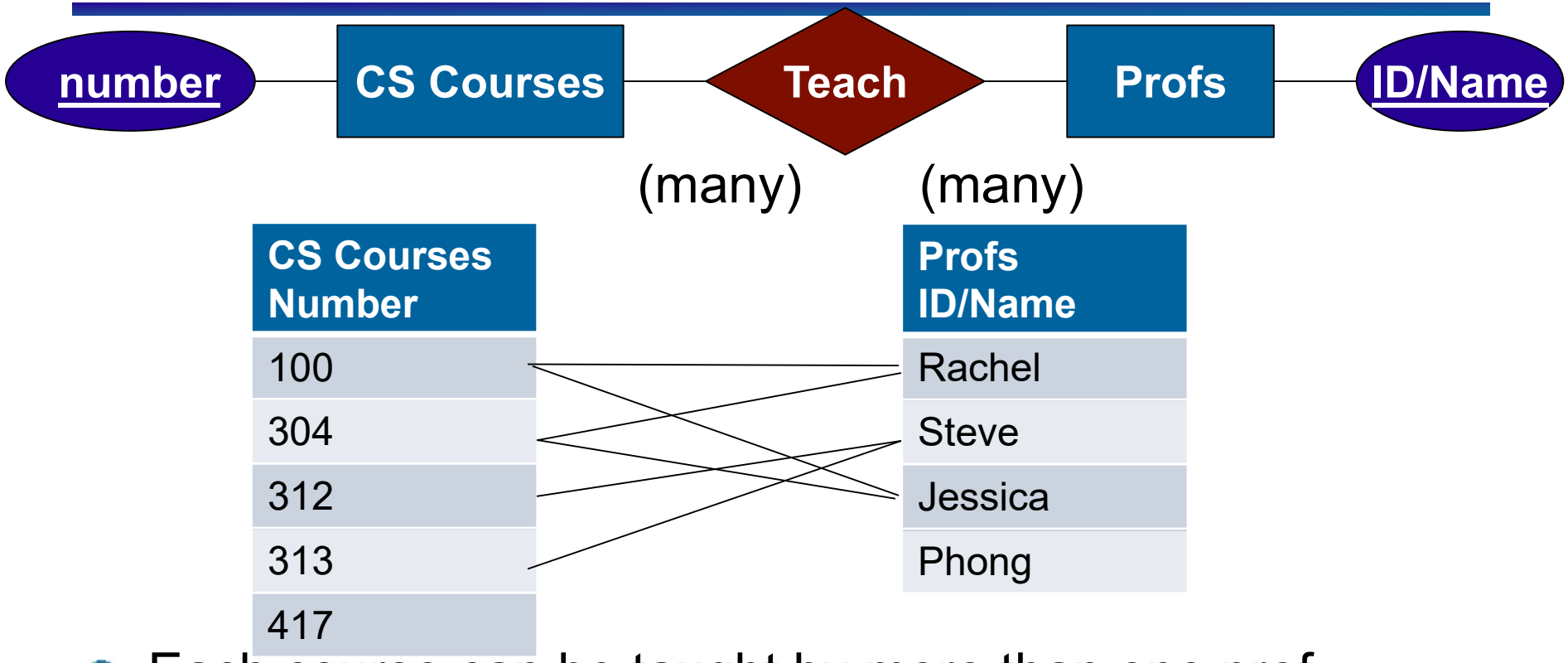


- Let's assume that the following is our entire set of entities:

CS Courses Number
100
304
312
313
417

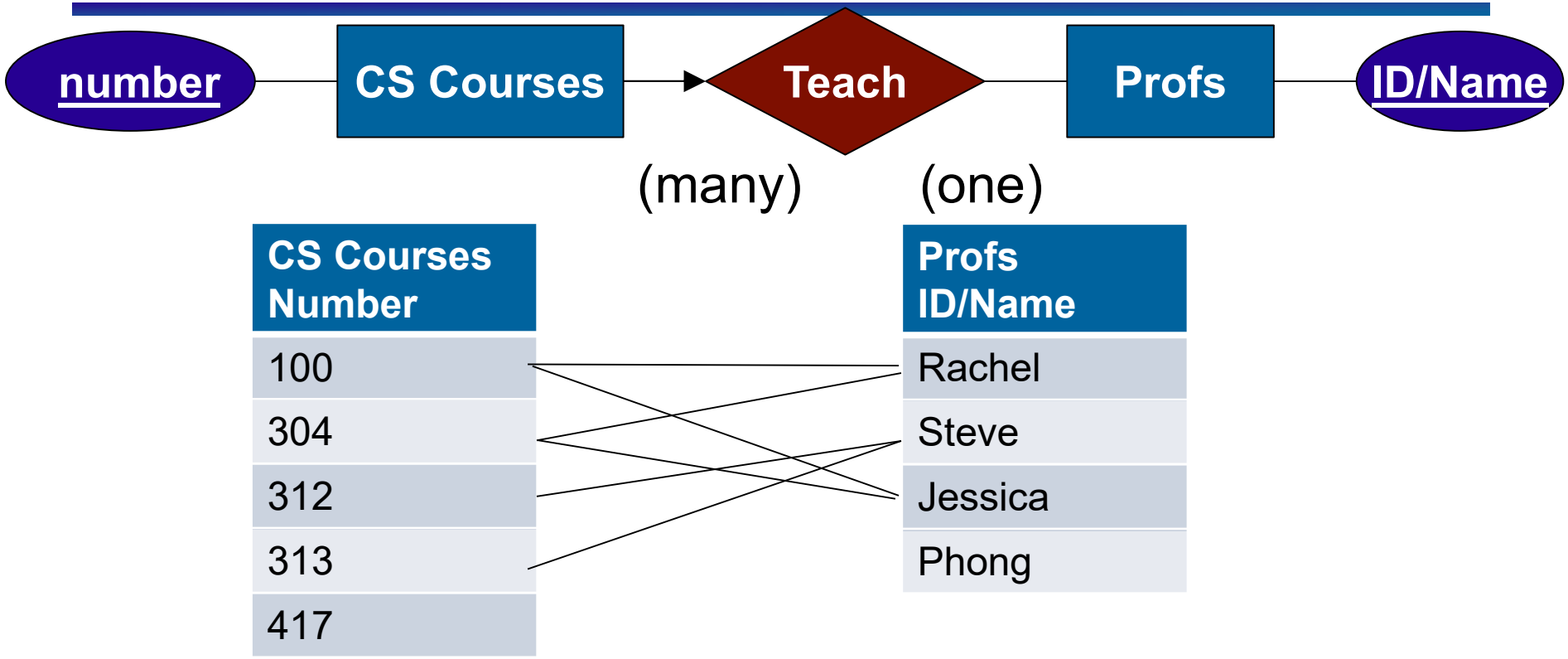
Profs ID/Name
Rachel
Steve
Jessica
Phong

Plain lines only



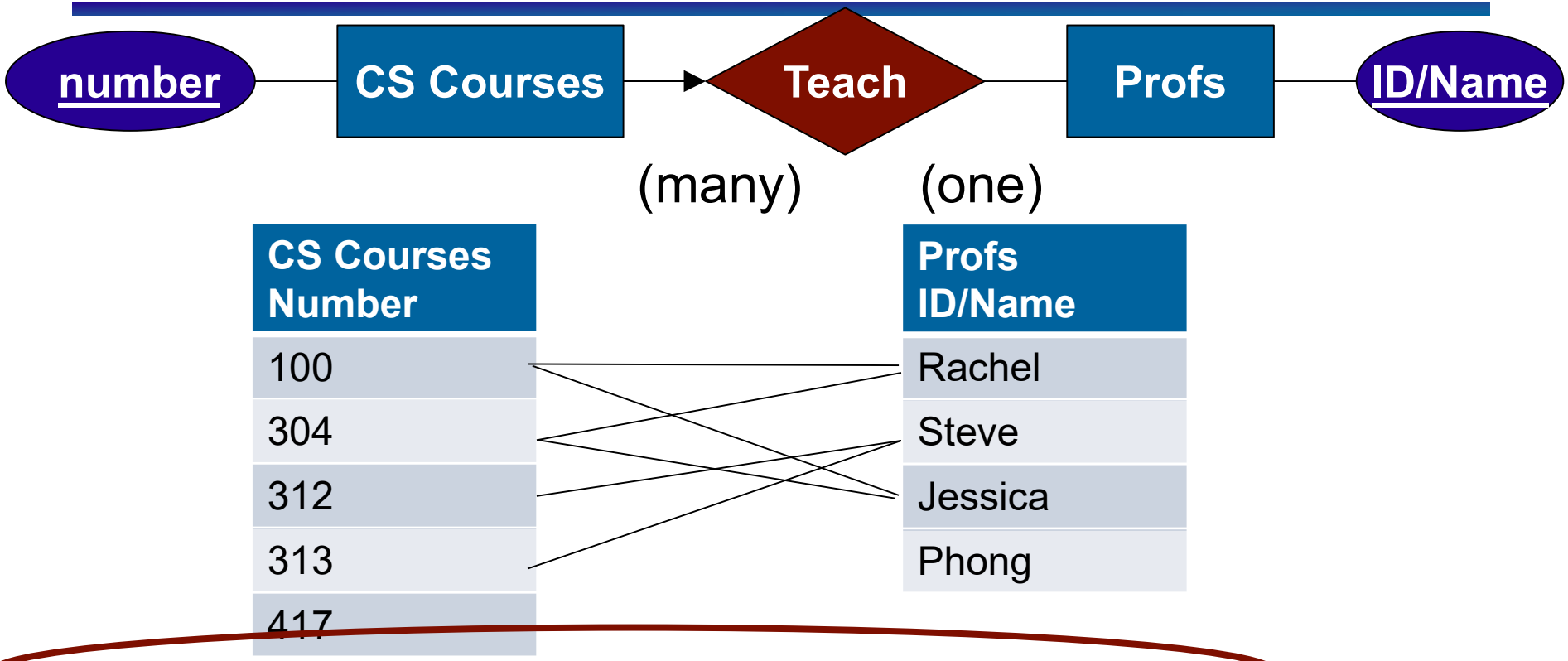
- Each course can be taught by more than one prof
- Each prof can teach more than one course
- Not all courses have to be taught by some prof
- Not all profs have to teach a course

Clicker question: Many-to-one. Which of the following would allow us to satisfy the given constraint?



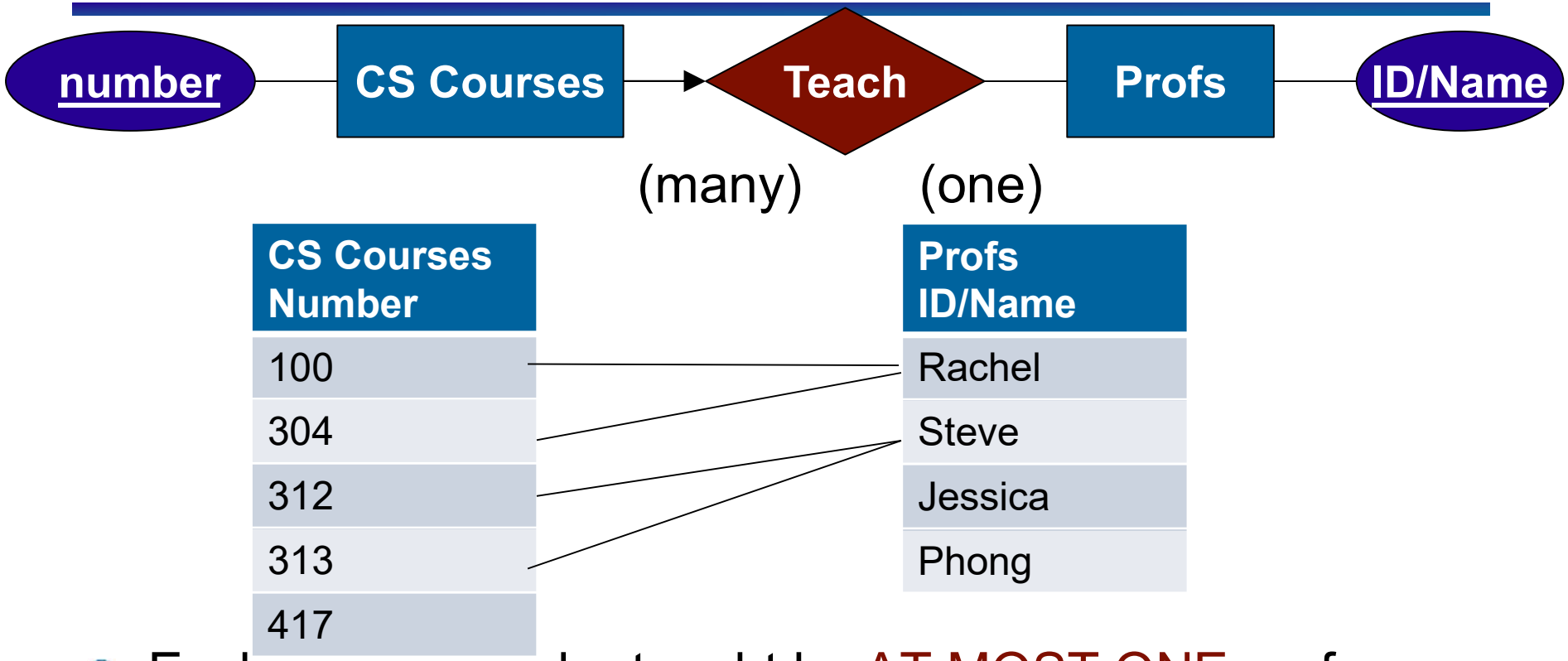
A. Removing {(100,Rachel), (304, Jessica)} from Teach
B. Removing {(304,Rachel), (304, Jessica), (312, Steve)} from Teach
C. Adding {(417, Phong)} to Teach
D. All of the above
E. None of the above

Clicker question: Many-to-one. Which of the following would allow us to satisfy the given constraint?



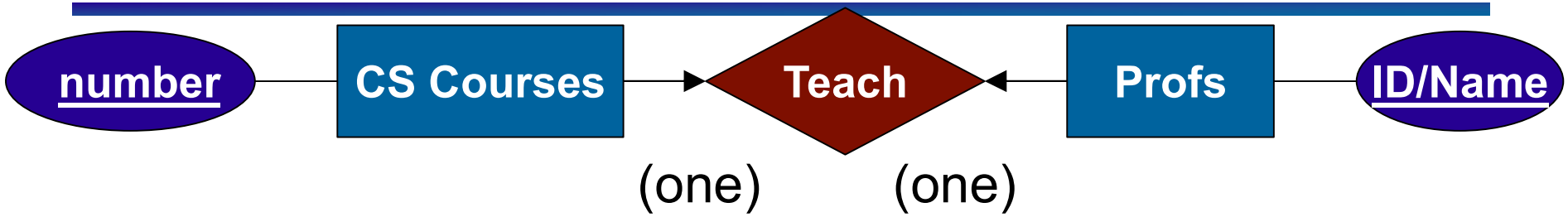
A. Removing {(100,Rachel), (304, Jessica)} from Teach
B. Removing {(304,Rachel), (304, Jessica), (312, Steve)} from Teach
C. Adding {(417, Phong)} to Teach
D. All of the above
E. None of the above

Many-to-one



- Each course can be taught by AT MOST ONE prof
- Each prof can teach more than one course
- Not all courses have to be taught by some prof
- Not all profs have to teach a course

One-to-one



CS Courses Number
100
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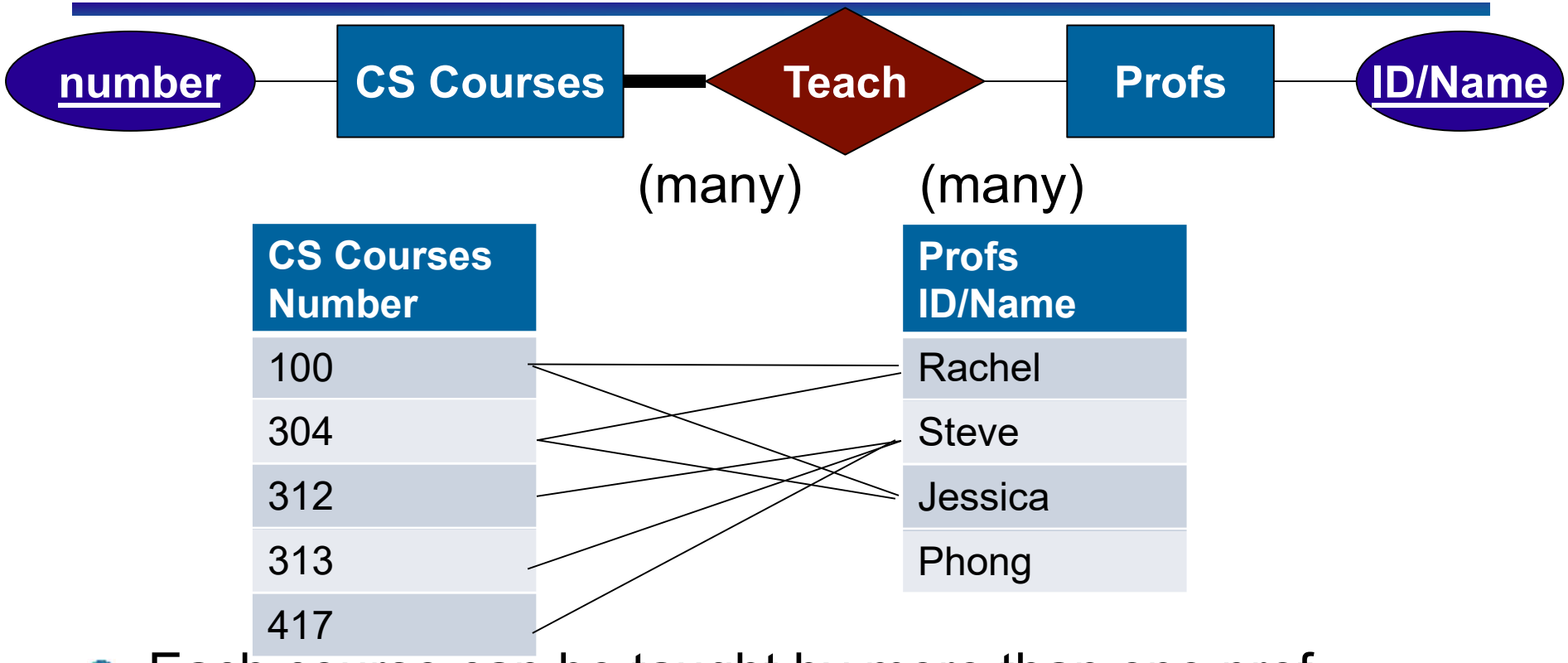
417

Profs ID/Name
Rachel
Steve
Jessica
Phong

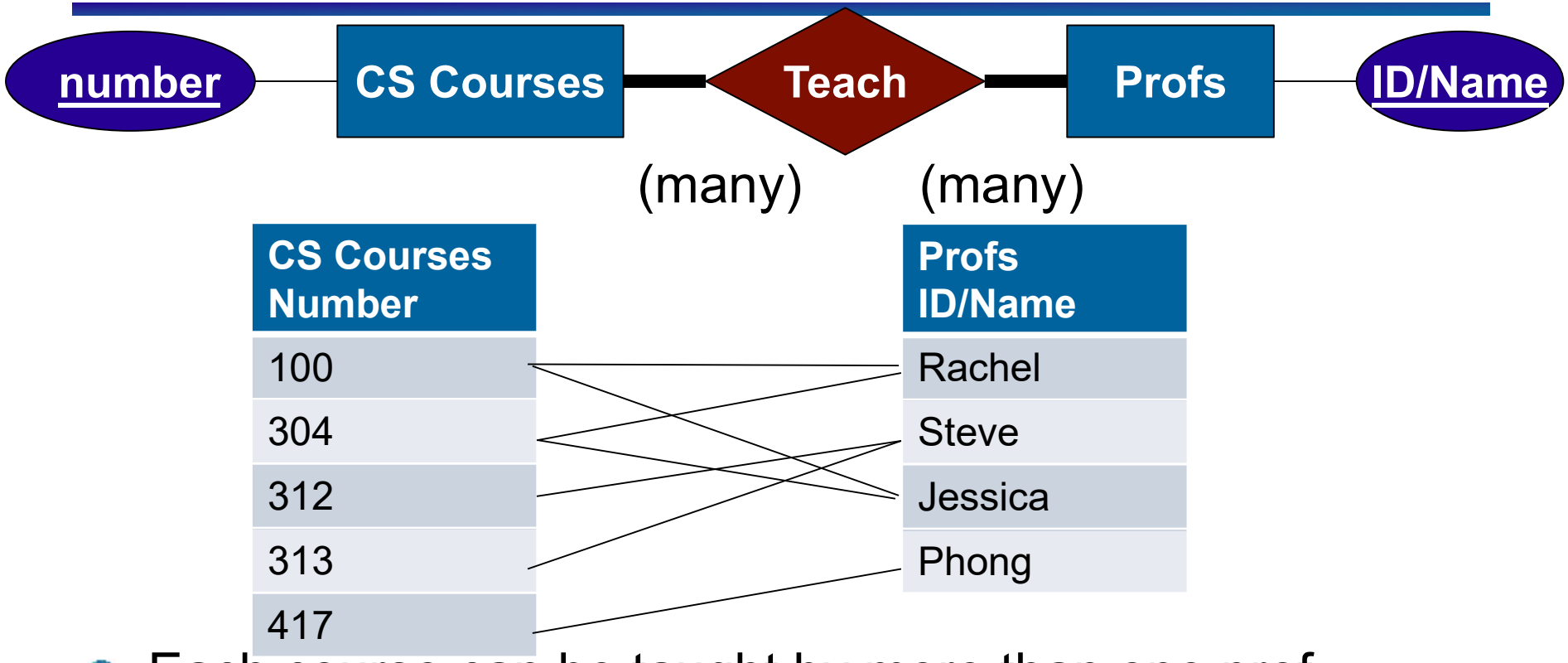
- Each course can be taught by AT MOST ONE prof
- Each prof can teach AT MOST ONE one course
- Not all courses have to be taught by some prof
- Not all profs have to teach a course

Thick lines – on one side



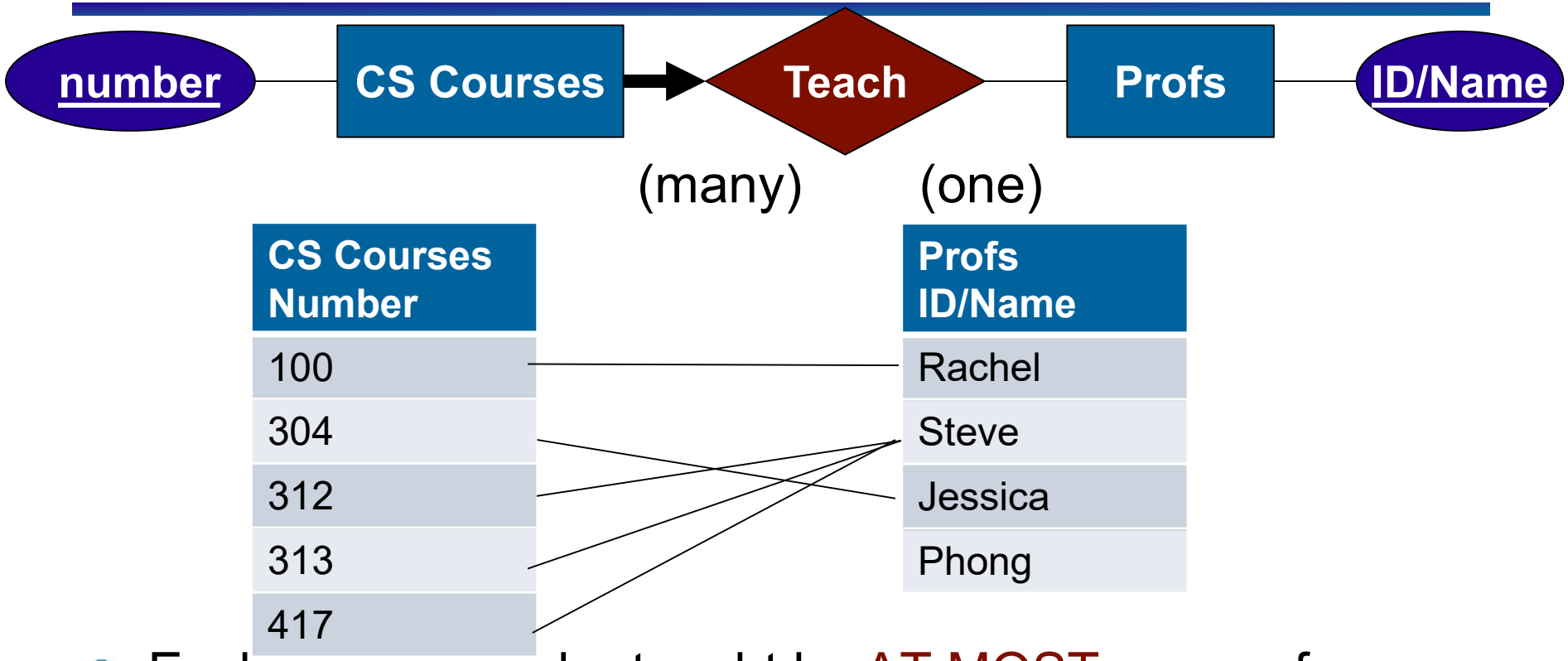
- Each course can be taught by more than one prof
- Each prof can teach more than one course
- All courses have to be taught by some prof
- Not all profs have to teach a course

Thick lines – on both sides



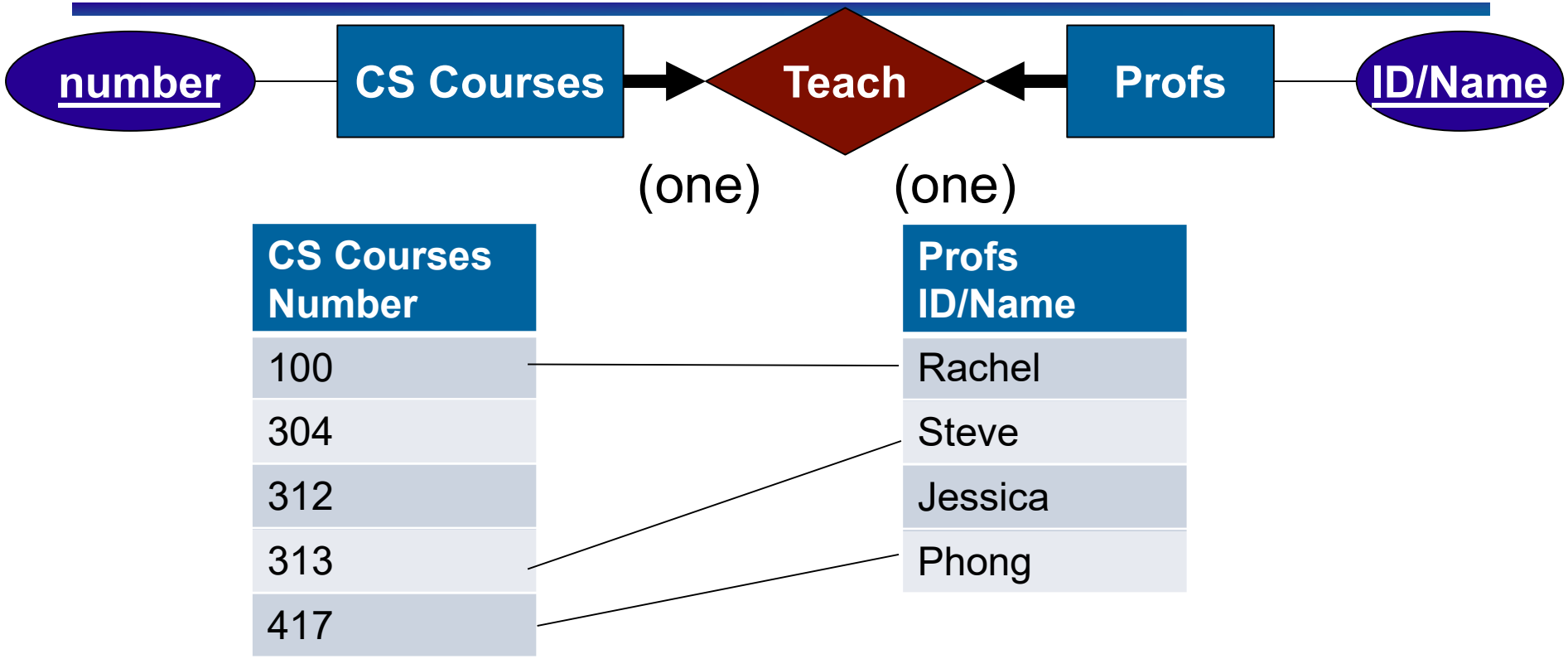
- Each course can be taught by more than one prof
- Each prof can teach more than one course
- ALL courses have to be taught by some prof
- ALL profs have to teach a course

Thick lines with arrows – on one side



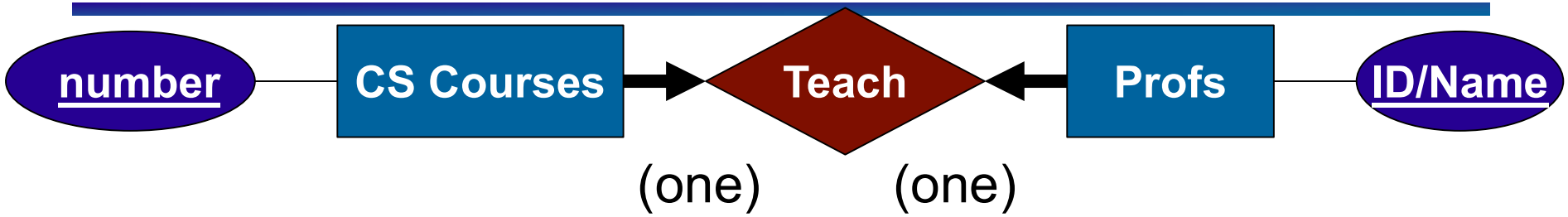
- Each course can be taught by AT MOST one prof
- Each prof can teach more than one course
- ALL courses have to be taught by some prof
- Not all profs have to teach a course

Clicker question: Thick lines with arrows – on both sides: Which of the following would allow us to satisfy the given constraint?



A. Adding {(304,Jessica)} to Teach
B. Adding {(304, Jessica), (312, Steve)} to Teach
C. Both of the above
D. None of the above

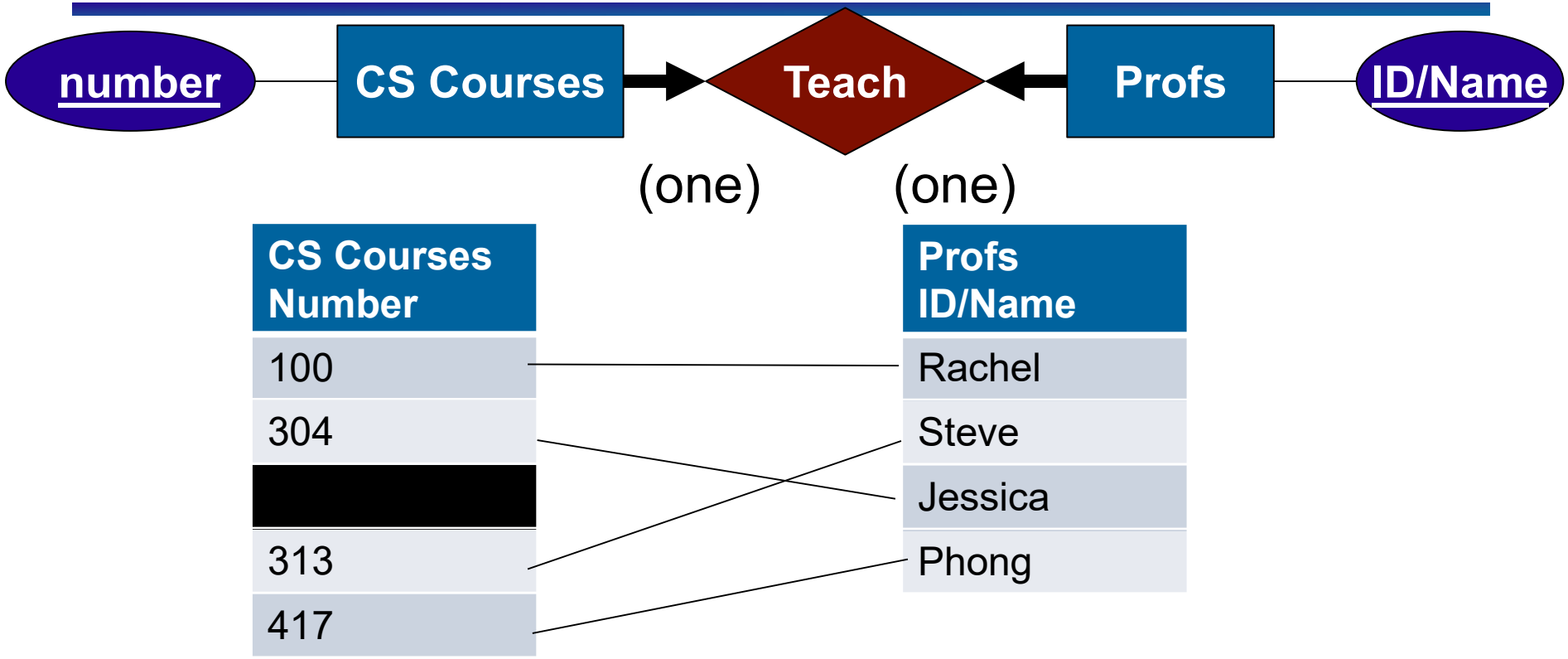
Clicker question: Thick lines with arrows – on both sides: Which of the following would allow us to satisfy the given constraint?



CS Courses Number	Profs ID/Name
100	Rachel
304	Steve
312	Jessica
313	Phong
417	

A. Adding {(304,Jessica)} to Teach
B. Adding {(304, Jessica), (312, Steve)} to Teach
C. Both of the above
D. None of the above

Thick lines with arrows – on both sides



- Each course can be taught by AT MOST one prof
- Each prof can teach AT MOST one course
- ALL courses have to be taught by some prof
- ALL profs have to teach a course
- **Some course has to go!**