

## Problem 1

1. name is not a candidate key because Smith has 2 instances.

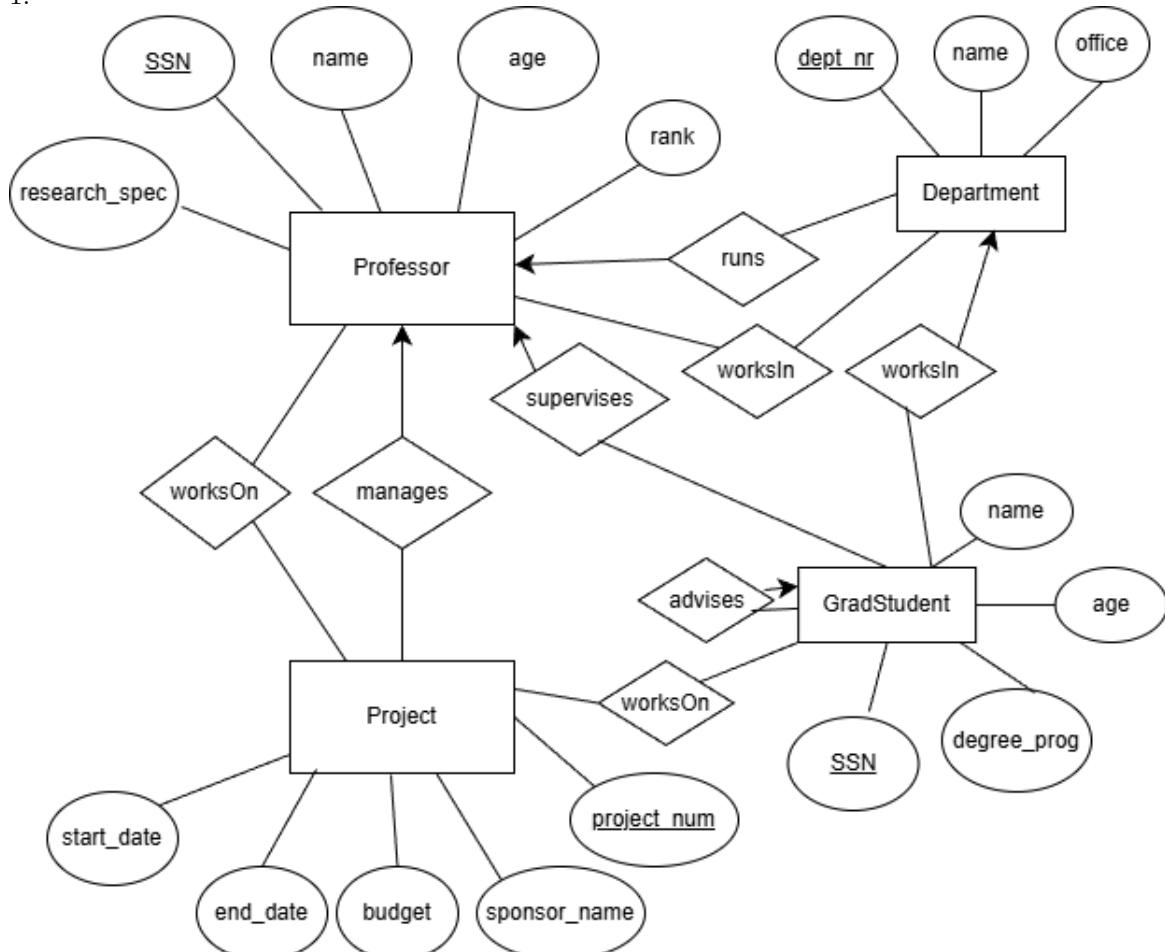
age also has 2 instances, so it cannot be a candidate key.

All others are candidate keys for this legal instance.

2. The set of attributes I would choose for a candidate key are sid and login, since they must be unique as no 2 students can have the same Student ID or email address. GPA is also technically an attribute for a candidate key in this instance as it has no duplicates, but that would be a bad choice in real life as multiple students can have the same GPA.

## Problem 2

1.



2.

Professor(ssn, name, age, rank, research\_spec)

Department(dept\_nr, name, office, chair\_ssn)

Project(project\_num, sponsor\_name, budget, start\_date, end\_date, manager\_ssn)

GradStudent(ssn, name, age, degree\_prog, dept\_nr)

ProfWorksOnProject(prof\_ssn, project\_num)

GradStudentWorksInDept(grad\_student\_ssn, dept\_nr)

ProfessorWorksInDept(prof\_ssn, dept\_nr)