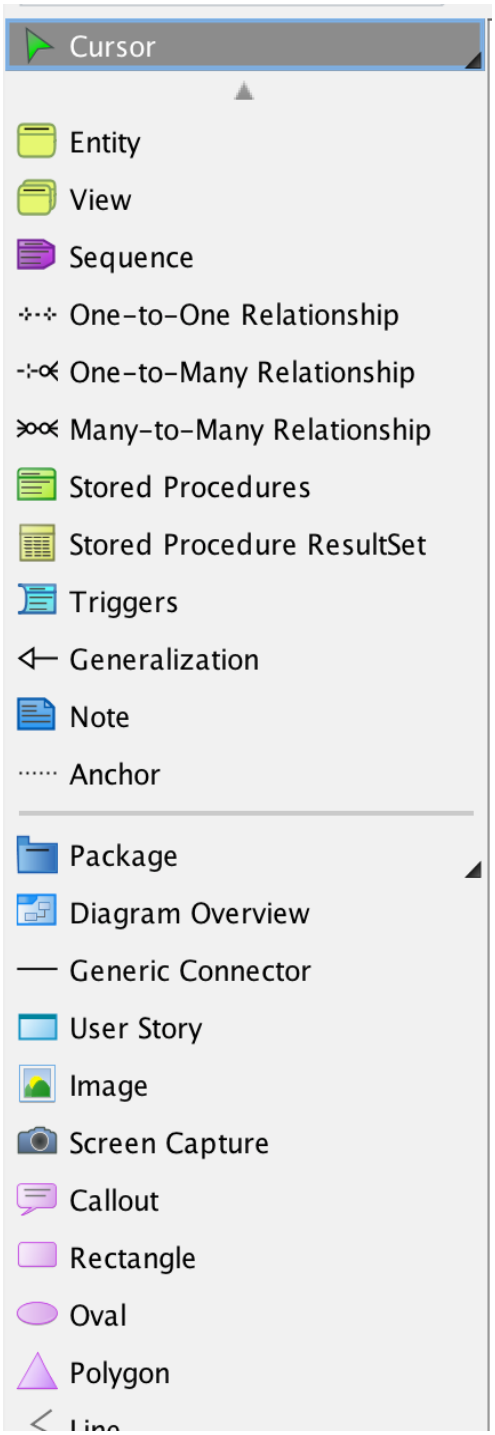
ASDV 2540, Databases Design
Assignment 1

Problem 1

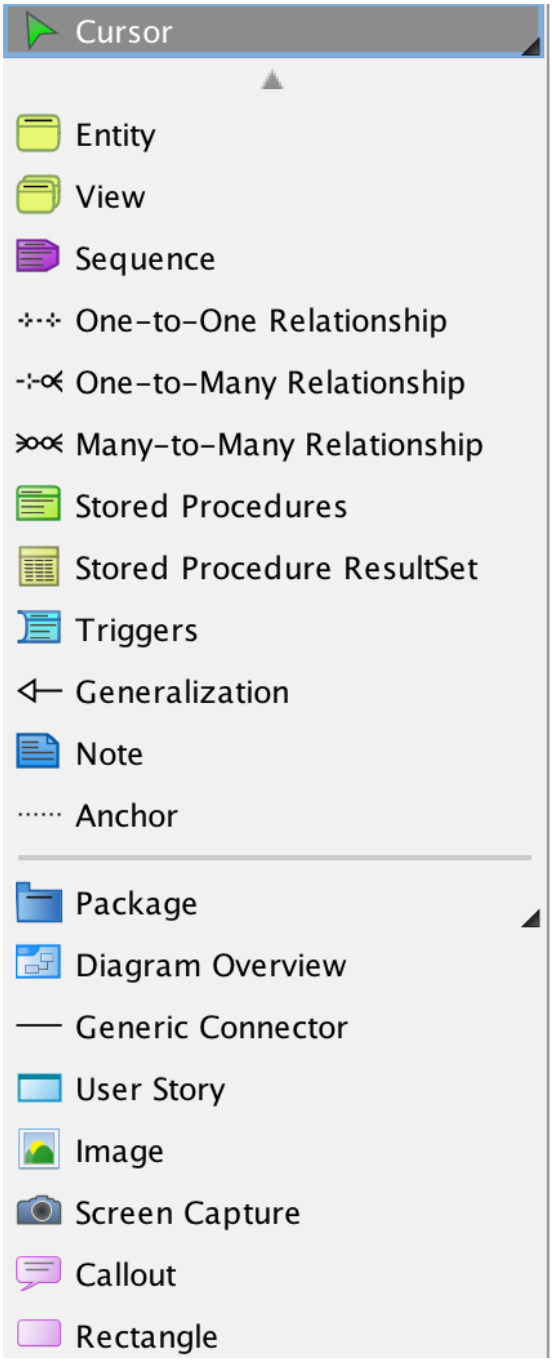
1. Start Visual Paradigm.



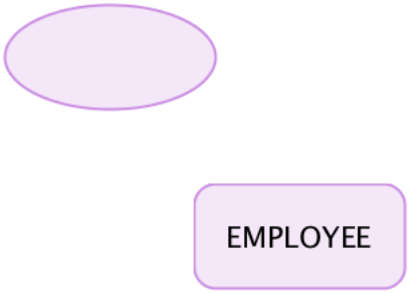
Connector (not Generic) will be used to connect

Rectangle will be used for ENTITIES
Oval will be used for ATTRIBUTES
Polygon will be used for RELATIOSHIPS

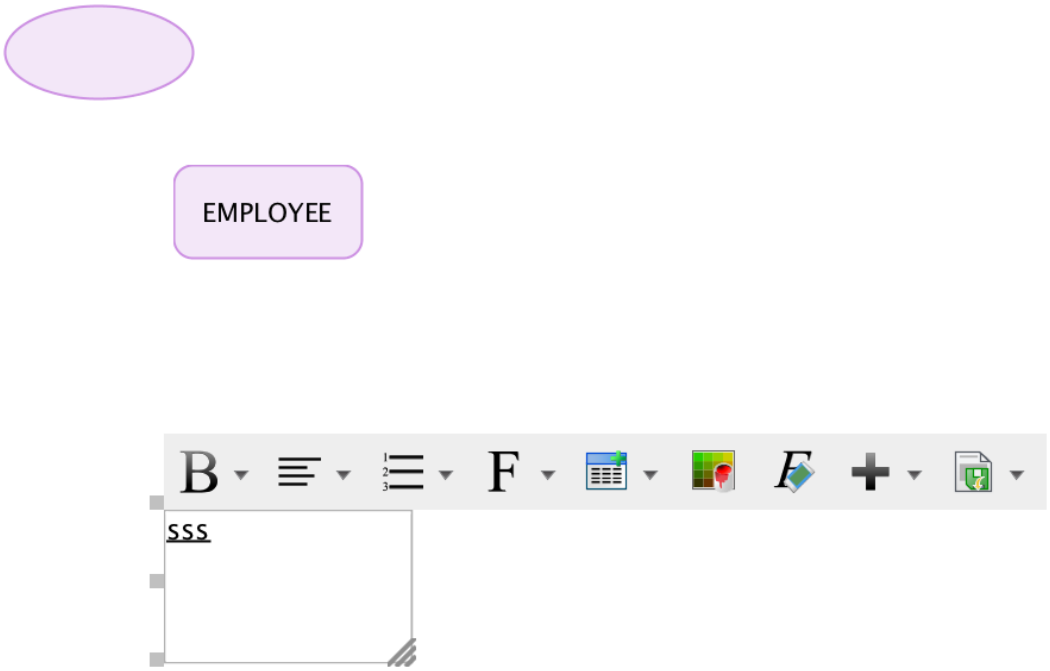
2. Click on **Rectangle** click again in the drawing area to put it in as an entity. Type in EMPLOYEE with capital letters.



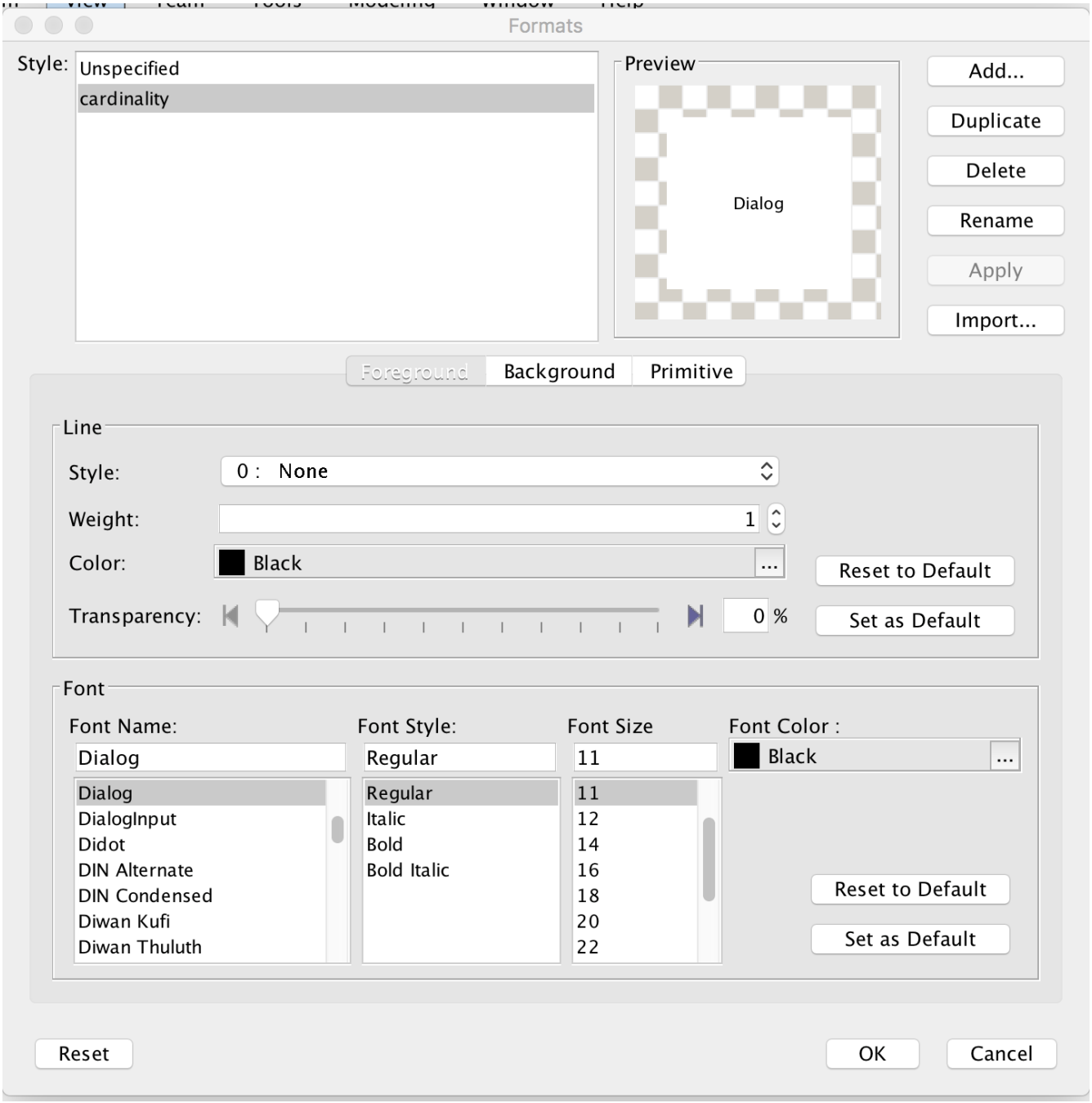
3. Click on **Oval,** click again in the drawing area to put it in as an attribute of Employe. . *Put NO TEXT* inside the oval.



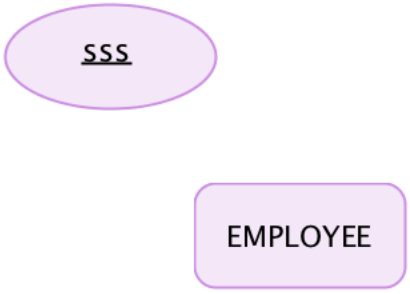
4. Click the Text Box element. From the menu's **B,** select underline and type <u>ssn</u> *<u>inside</u>* the text box.



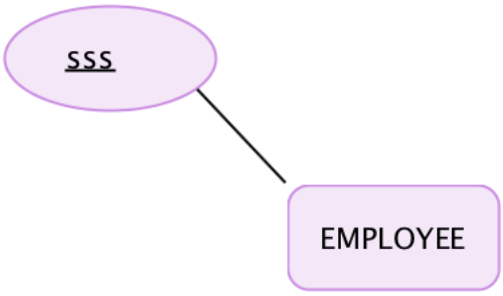
5. Right click on Text Box > Styles and Formatting > Format . When the dialog appears (click Foreground) create a new style (click add) of Text Box and call it **cardinality, as shown below**. Check the options as show below, so the text box HAS NO BORDER. The font is up to you.



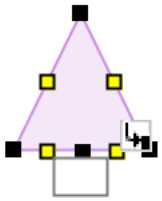
6. Drag the text box inside the Oval.



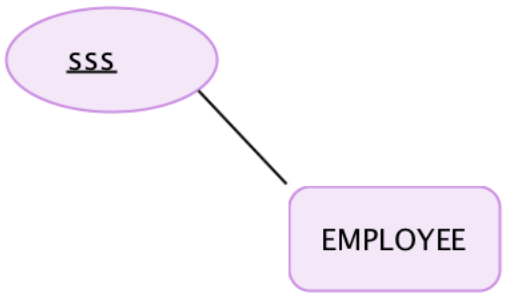
7. Click on **Connector(not Generic Connector),** click on OVAL ***ssn***, keep the left button of the mouse down and drag it down to connect the **ssn** with the **Employee**. Release the left button of the mouse when the connection is viable.

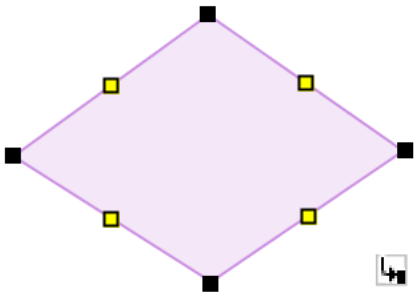


8. To ***create a relationship,*** click the Polygon and put it in the drawing area.

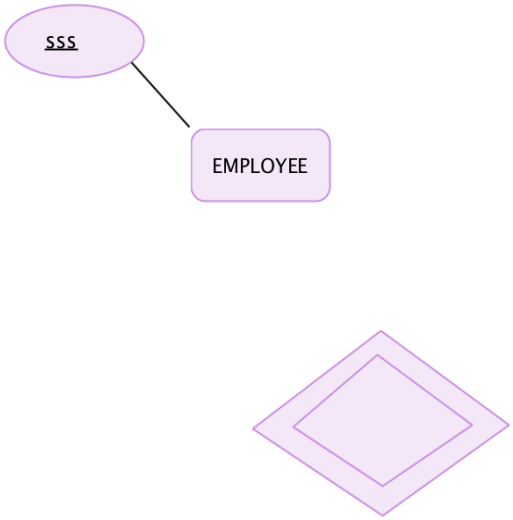


9. Drag downwards the middle dot of the base line of the above triangle to create a Diamond as shown below.

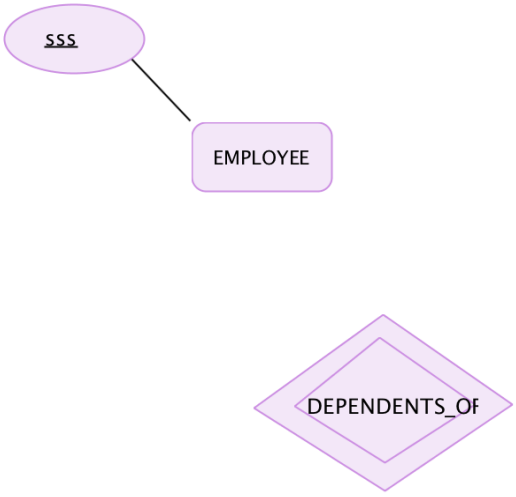




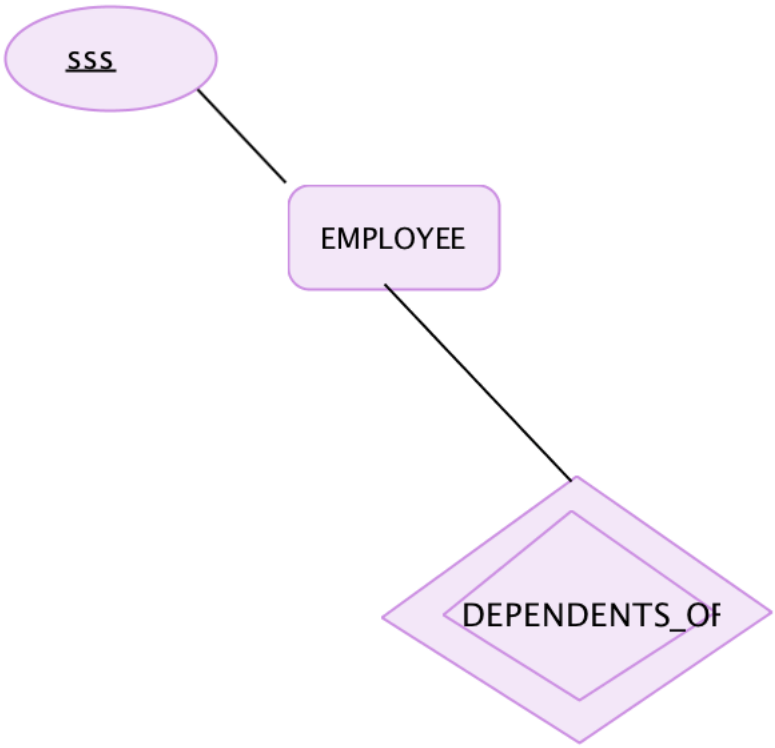
10. To convert a normal relationship to a week-entity-relationship you need a diamond inside a diamond. Put a diamond inside a diamond.



11. Lastly, put a TEXT BOX inside the outer diamond.



12. Use a CONNECTOR (**not** Generic Connector) and connect the Diamond (DEPENDENTS_OF) to the Rectangle (EMPLOYEE)



13. Using the techniques you have just applied and design the ER diagram shown below. Save it, and THEN export the diagram as problem1.jpg (Project >Export > Diagrams as Image)

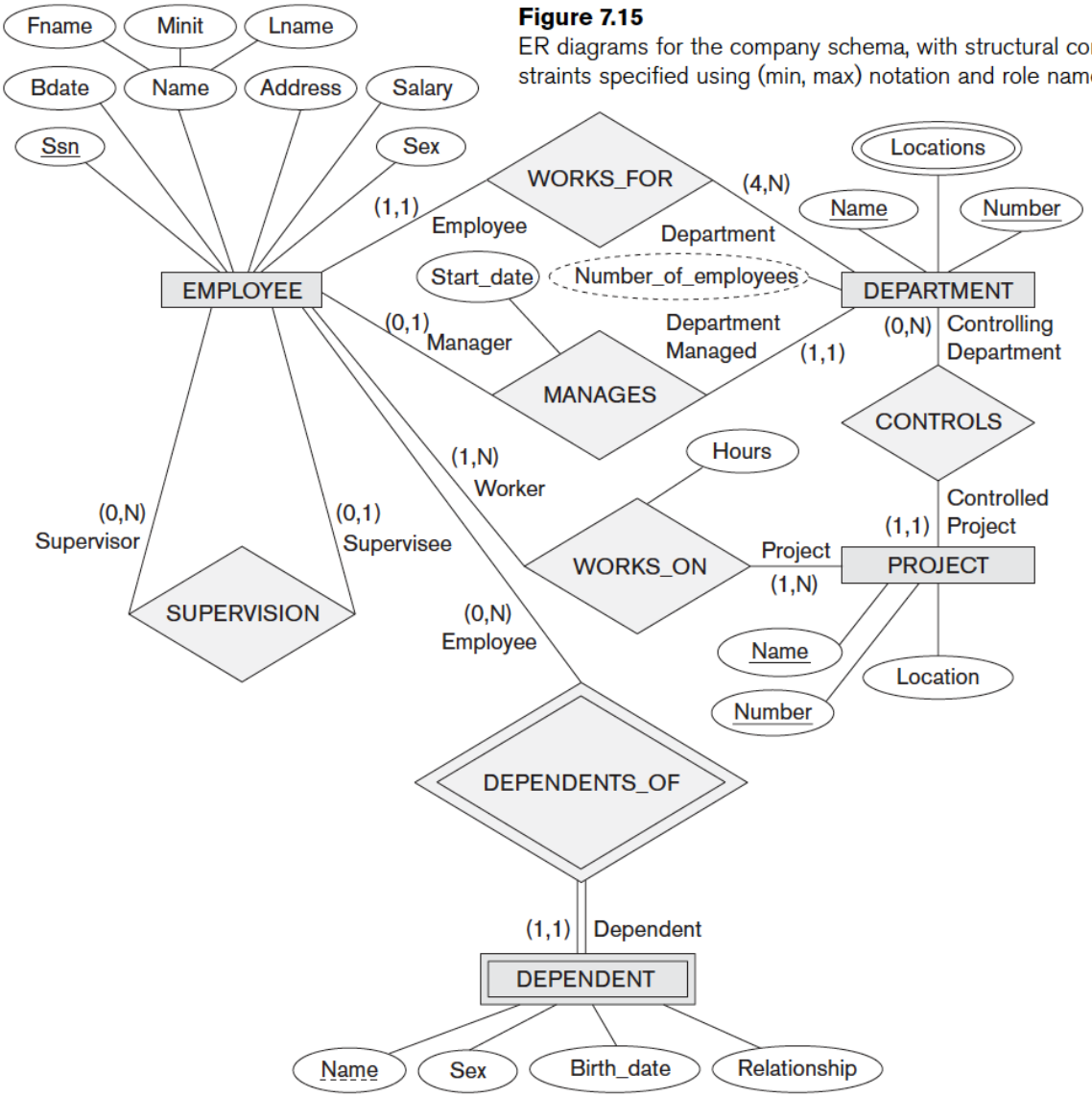


Figure 7.15
ER diagrams for the company schema, with structural constraints specified using (min, max) notation and role names.

Problem 2

Consider the following set of requirements for a UNIVERSITY database that is used to keep track of students' transcripts.

a. The university keeps track of each student's name, student number, Social Security number, current address and phone number, permanent address and phone number, birth date, sex, class (freshman, sophomore, ..., graduate), major department, minor department (if any), and degree program (B.A., B.S., ..., Ph.D.). Some user applications need to refer to the city, state, and ZIP Code of the student's permanent address and to the student's last name. Both Social Security number and student number have unique values for each student.

b. Each department is described by a name, department code, office number, office phone number, and college. Both name and code have unique values for each department.

c. Each course has a course name, description, course number, number of semester hours, level, and offering department. The value of the course number is unique for each course.

d. Each section has an instructor, semester, year, course, and section number. The section number distinguishes sections of the same course that are taught during the same semester/year; its values are 1, 2, 3, ..., up to the number of sections taught during each semester.

e. A grade report has a student, section, letter grade, and numeric grade (0, 1, 2, 3, or 4).

Design an ER Diagram using Visual Paradigm. Use regular cardinality 1-1, 1-M, and M-M instead of min and max. Export the diagram as problem2.jpg.