Homework #1

Software Modeling and Design (COMP 3700 Spring 2021)

Maximum points: 100

(Individual Assignment)

Assignment Goals:

1. Get you familiar with UML tools. (such as draw.io)
2. Understanding Class Modeling concepts such as classes, attributes, methods, and relationships.
3. Understanding and identifying the different types of associations between classes.
4. Being able to convert written descriptions into a UML class model and vice versa.

Requirements:

* Work on the homework on your own and don't share your answers with any students.
* Use any UML tool of your choice. No handwritten (even with tablets) or scanned drawing, or taken by camera! are allowed. Make sure the drawings are readable; for example, use proper sizes. Use the export function to convert to images.
* Submit a single pdf file (.pdf) to Canvas before the due date. This should be the only file you should submit to Canvas.

The file should be named {USERNAME}_HW{NUMBER}.pdf

USERNAME is your auburn email without "@auburn.edu"

E.g. abc0003_HW1.pdf

* ⚠ No homework will be accepted after the due date, so make sure to start as early as you can.

Question #1 (5*2 = 10 Points):

Classify the following into generalization, association, aggregation, or composition:

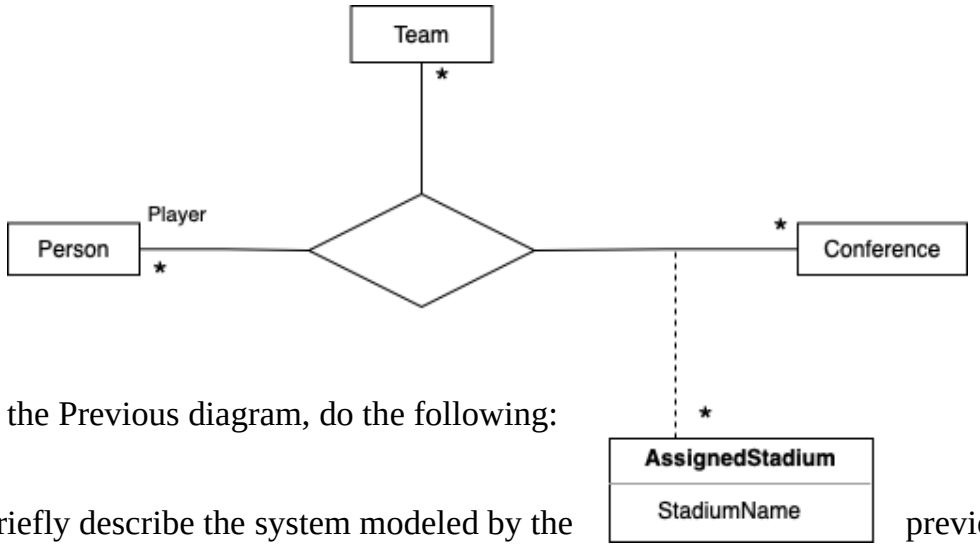
1. A file is an ordinary file or a directory file.
2. Files contain records.
3. A relation can be association or generalization.
4. A polygon is composed of an ordered set of points.
5. A person uses a computer language on a project.

Question #2 (4* 5 = 20 Points):

Draw a Class Model corresponding to each of the descriptions below. You don't need to include attributes and methods. However, you have to include all the required details such as relationships, associations, multiplicity, end names, etc :

1. An employee is either a full-time employee, a part-time employee, or an intern employee (Student employee).
2. A University consists of Colleges, which in turn consist of Departments.
3. A Seminar is given by at least two speakers and managed by a coordinator.
4. A driver may own cars that can be driven by authorized drivers.

Question #3 (6+7+3+4=20 Points):



Using the Previous diagram, do the following:

A. Briefly describe the system modeled by the previous class diagram.

B. Modify the previous diagram to promote the N-ary association into a class.

C. Why would we want to promote the N-ary association into a class?

D. Did this promotion make a difference in the meaning of the model? Briefly justify your answer.

Question #4 (25 Points):

Draw a Class Model corresponding to the description below:

A customer may place any number of orders. Each order is received on a specific date, may be prepaid when order is received. Each order is identified by a number, and the price/value of order. Each order may include any number of items. For each item, the number / quantity ordered as well as its price is provided. A given product may comprise one or more items. Each customer is identified by name and address, and based on those values, we should be able to retrieve the CreditRating of customer. Customer may be a personal customer, who is allowed to pay by CreditCard by providing the CreditCardNumber. Customer may be a corporate customer, who will be assigned a SalesRep, an employee of company. For each corporate customer, their contact details are saved in company database along with their CreditRating and CreditLimit allowed.

Question #5 (25 Points):

Describe the system modeled by the following class diagram: