CIS641
Fall 2022

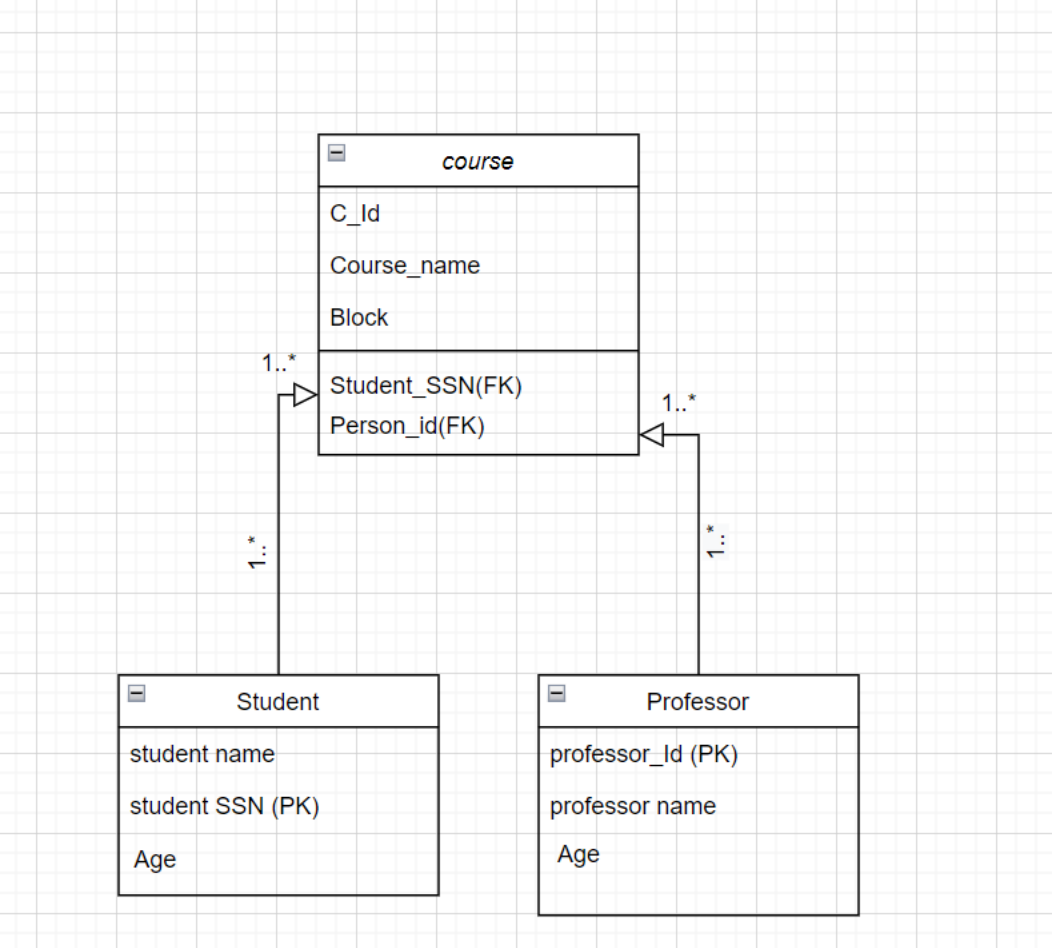
Assignment 4 (Individual)
Due by: October 21st at 11:59pm
60 points

This homework is intended to ensure you're following along with UML! Simply answer the following questions **individually**. Note: use draw.io / Visio / your vector-based tool of choice for creating the models.

1. (10 points) Draw the high-level class diagrams and relationships described by the following rules. Include multiplicities for each relationship:

a) A professor may be assigned to multiple courses, and students may enroll in multiple courses.

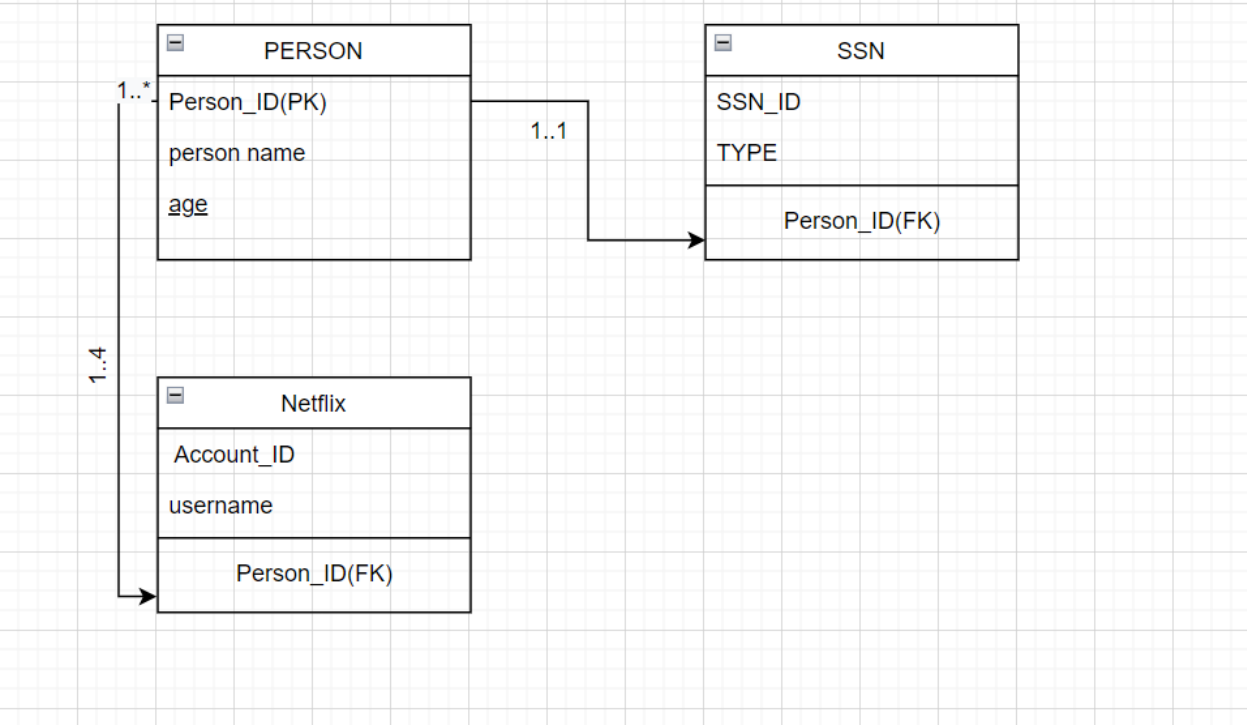
In the Table student table to course table has **One-To-Many** relationship. And the professor to course having **One-To-Many** relationship.



b) A person has one social security number and that number must be unique.

b) One person can hold a Netflix account but can share those credentials with up to four other people.

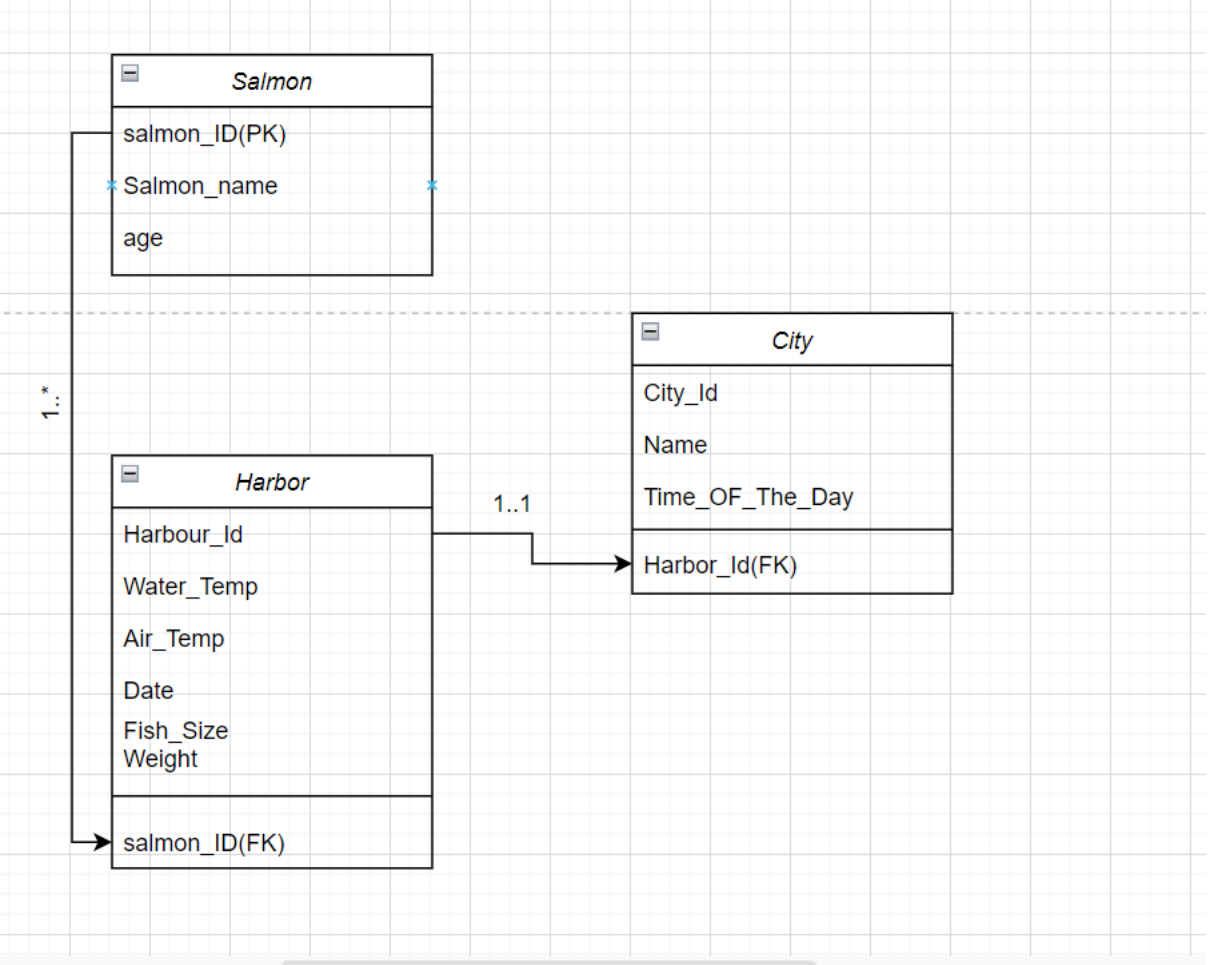
I have combined the B and C questions where the Person Table to SSN table has **ONE -TO-ONE** relationship. Whereas the Person and the Netflix Table had the **One -To -Many** Relationship.



2. (20 points) Draw a class diagram based on the following information:

GVSU is interested in designing a system that will track the number of salmon that visit the various harbors in the area. Information of interest includes the city, time of day, water temperature, air temperature, date, fish size, fish type, and fish weight. As salmon may be associated with multiple harbors, but each city may only have one harbor.]

In the Table Salmon table to Harbor table has **One-To-Many** relationship. And the Harbor to City having **One-To-One** relationship



3. (30 points) *Read the following case study and respond to the questions at the bottom (at the level of detail expected for a graduate student).*

Grand Valley State Marinas is a chain of school-sponsored marinas that offer lakeside service to boaters; service and repair of boats, motors, and marine equipment; and sales of boats, motors, and other marine accessories. The systems development project team at Grand Valley State Marinas has been hard at work on a project that eventually will link all the marina's facilities into one unified, networked system.

The project team has developed a use-case diagram of the current system. This model has been carefully checked. Last week, the team invited a number of system users to role-play the various use cases, and the use cases were refined to the users' satisfaction. Right now, the project manager feels confident that the as-is system has been adequately represented in the use-case diagram.

The director of operations for Grand Valley State Marinas is the sponsor of this project. He sat in on the role-playing of the use cases and was very pleased by the thorough job the team had done in developing the model. He made it clear to you, the project manager, that he was anxious to see your team begin work on the use cases for the to-be system. He was a little skeptical that it was necessary for your team to spend any time modeling the current system in the first place but grudgingly admitted that the team really seemed to understand the business after going through that work.

The methodology you are following, however, specifies that the team should now turn its attention to developing the structural models for the as-is system. When you stated this to the project sponsor, he seemed confused and a little irritated. "You are going to spend even more time looking at the current system? I thought you were done with that! Why is this necessary? I want to see some progress on the way things will work in future!"

3.a) What is your response to the director of operations?

I will agree to the Director's response that to develop and implement the project the one use case Diagram is not enough to complete the setup. Basically, we need to understand what the lower level of the business does and need to gather the requirements and implement the different modeling techniques to frame the project. So that would be easy to explain or understand the full functionality of the project and its working. While developing the project also those modeling structure will be used to create the flow of the application.

3.b) Why do we perform structural modeling?

The structural model provides the framework of the system, and this framework is where all other components live. Class diagrams, component diagrams and deployment diagrams are therefore part of structural modeling. They all represent elements and the mechanisms that bring them together. This can be helpful to understand the requirements of the system clearly and in the implementation phase also it will be useful to develop the application. the elements of a system that are independent of time and that convey the concepts of a system and how they relate to each other.to identify these kinds of things in the project we need to utilize the structural modeling techniques.

3.c) Is there any benefit to developing a structural model of the current system at all?

There will be a lot of advantage's in developing the structural model for this Marinas project like they have many complex relationships in this project and, they have different set of operations involved in this project like they were offering the services of the boats and maintenance for the boats. And, they had another business model to sale the boats, motors and other marine accessories. there are many relationships involved in this project where the user will be using both the services provided by the application and need to track those requirements, so the class diagrams are the most important method They can assign the relationship between the user and the services that one to many or many to one like that. If we have a structural model that will cover all the operations so it would be an easy to develop the functionality for the application.

3.d) How do the use cases and the use-case diagram help us develop the structural model?

The use cases and use-case diagrams will be helpful to develop a structural model. Like the use cases will have the high-level perception of what the application needs to do and how the functionality should behave the use case diagrams will be used to understand the flow of the application and the integral connect ion between the pages in the application. In order to develop the class diagrams and the object

diagrams these use cases will be helpful to understand the flow and complete the setup of the application the flawless way.

3.e) What is the purpose of continuing the modeling process to behavioral models?

A behavioral model describes interactions within a system. Represents interactions between structure diagrams. Behavioral modeling reveals the dynamic nature of systems also It shows how a system behaves and interacts with itself and other entities (users, other systems). They show how data moves through the system, how objects communicate with each other, how the passage of time affects the system, or events that change the internal state of the system. Behavioral diagrams show the behavior of the system and are often used to describe the functionality of software systems. As an example, activity diagrams step-by-step describe the business and operational activities of components in a system.