# CSCE 156/156H: Project Overview

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> If you don't have the time to do it right, then you'll have to find the time to do it over.

## 1 Introduction

Over the course of this semester, you will incrementally build a substantial database-backed application in Java. In each phase of the project you will focus on a particular component, which will have *deliverables* that you must hand in by a certain date. These deliverables may include a Java Archive (JAR) file, source code, non-trivial test cases, database schemas and a well-written technical design document.

Each phase builds upon prior phases and may also require updates and modifications to prior phases. It is important that you understand the entire scope of the project. You should read all of the assignments to get a better understanding of where the project will be going.

The iterative nature of this project means that it is important that you do not fall behind. In each phase it is also important that you have a good, well-thought design to make subsequent phases easier to design, extend and implement. Poor designs, bad implementations, bugs and broken code will mean subsequent phases of this project will suffer. Investing your time and resources upfront will minimize your *technical debt* and mitigate the need to update or refactor your design later on. Remember one of the Golden Rules of coding: only code that which you would not mind having to maintain.

## 2 Problem Statement

Cinco Computer Consultants (CCC) is a medium sized corporation that provides computer services to regional companies including equipment and services such as training, consultations and licenses. Though the services that CCC supplies are state-of-the art, its invoice system is not. CCC has hired you to design and implement a simple invoice system to replace

the aging AS400 green-screen system that they currently use. It will be your responsibility to design a new system from scratch that is Object-Oriented, written in Java, and supports CCC's business model by implementing their business rules and providing the functionality as stated below. CCC offers several products: equipment, consultations, and licenses. Each product consists of various pieces of data. All products have a unique alphanumeric product code and a name.

- **Equipment** includes various computer and electronic products that CCC sells to its clients as a reseller. All equipment has a price-per-unit cost. When a piece of equipment appears on an invoice, the total cost is the price-per-unit times the number of units on the invoice. There are no additional fees or other costs for equipment.
- **Consultations** are services that are offered to clients by CCC such as training, system evaluations, etc. Consultation services are associated with a consultant (a person) and are billed to the client on a per-hour basis. In addition to the hourly cost, there is a flat $150 service fee for all consultations. Consultations have an hourly fee and when they appear on an invoice, a total number of billable hours. Thus, the total cost of a consultation is the hourly fee multiplied by the number of billable hours plus the $150 service fee.
- **Licenses** are also products that include things like software, server hosting, or third-party services. Licenses also carry a service fee, but the amount is different for each license. In addition, each license also has an annual license fee. When a license is included in an invoice, it has effective dates: a beginning and end date to determine billing. The total cost of a license is the number of days included in the effective dates divided by 365 multiplied by the annual service fee plus the flat service fee.

Invoices are individual sales that include:

- A unique alphanumeric code identifying the invoice
- The customer that the sale has been made to
- A salesperson that was responsible for the sale
- A number of products made for that particular order

Depending on the customer and product on an invoice, various fees and taxes are also applied.

- For government customers, a flat state and federal compliance fee is applied of $125.00 per invoice. For corporate customers, there is no compliance fee.
- Equipment carries a 7% sales tax rate while services (licenses and consultations) carry a 4.25% sales tax rate for corporate customers. For licenses and consultations, tax is assessed only on the hourly fees, not the $150 service fee (consultations) nor the flat service fee (licenses)

- Government customers have no sales tax on any products as they are tax-free institutions

# 3 Project Outline

Over the course of this semester you will iteratively design an application to support this business model. Development has been broken down into 6 phases:

- Phase I: Data Representation & Electronic Data Interchange (EDI) – in the first phase you will design and implement the objects that will form a basis for the system and create parsers to read data from flat files, generate instances of your objects and export them to an interchange format (XML and/or JSON).
- Phase II: Summary Report – In this phase you will further refine your objects and define relationships between them to generate a summary report that aggregates pieces of data together.
- Phase III: Database Design – This phase focuses on designing a relational database to model your objects and support your application
- Phase IV: Database Connectivity – You will refactor your code to load your objects to your database rather than from flat files
- Phase V: Database Persistence – You will implement and use an API to persist (save) data to your database.
- Phase VI: Sorted List ADT – In this phase you design and implement a sorted list ADT and integrate it into your application