institute for SOFTWARE RESEARCH

# Engineering Data Intensive Scalable Systems 17-648

Project 1

## Objectives:

This project is designed to give you hands on experience with various aspects of data intensive distributed systems (the scalable part comes later). Much of the complexity of both dealing with data and the distribution is often abstracted away from the application developer. The issue is that as systems grow in scale these abstraction mechanisms start to break down. As the systems scale the burden on the application developer increases.

The individual projects are designed to force you to deal with these complexities by removing the abstractions prior to building a system at scale. Specifically this assignment is designed to:

- Gain hands on experience with issues related to concurrency
- Reason about what is required in order to ensure correct operations given multiple simultaneous users
- Think about things like data integrity

## Background:

Your business has started to grow. You recognize that the current technology is not going to support your business for very long. For now, however, you need to create the ability to be able to have multiple operators handle phone orders.

You have decided to create an order system that has all of the capability of the previous system but is available via a web interface. Additionally, the system can handle multiple operators accessing the system at the same time.

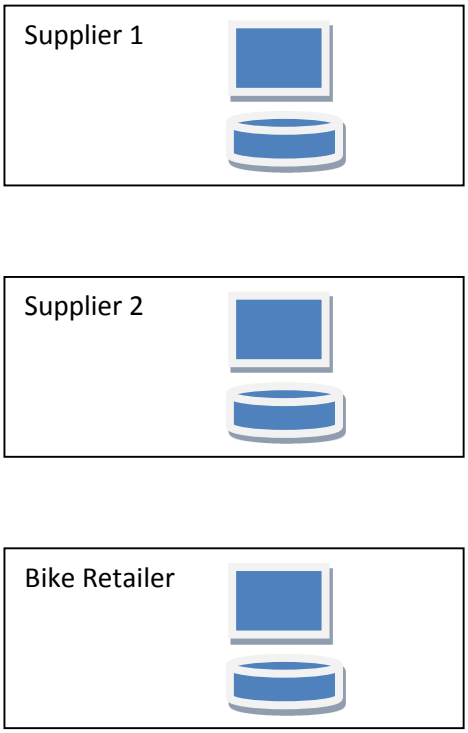
## Project:

The project is to add a web interface to the ordering system. The previous requirements for the system remain (as identified below). The system should work correctly with multiple users.

The functional requirements for the system are:

- Browse inventory
  - Order inventory by
    - Price
- Purchase inventory on behalf of your customers. For each order you should store:
  - Customer first and last name
  - Shipping address
    - Address
    - City
    - State
    - Zipcode
  - Items purchased
    - Item number
    - Item name
    - Price
    - Quantity
- Manage order status
  - Set orders to:
    - In process
    - Complete
- Search order history
  - By customer

You will continue to have access to the data sets for the two suppliers. These data sets will be in a text file, but will have evolved from the previous structure. The suppliers have separated the inventory data (the current bikes in stock) from the catalog data (the details of the bikes that the supplier typically stocks). You will still be responsible for the program that will allow you to access and update the data for each supplier. Each of the systems (and associated data) will reside on premise at your facilities and the suppliers respectively.




You are constrained to using Java SE 7 or later and Apache Tomcat 7 or later. You can use javascript, JSP, or Servlets for the processing of data on the web browser. Chrome will be the target browser.

## Deliverables:

You should deliver your source code and execution instructions. The code and instructions should be zipped together and submitted via blackboard by the due date. Late assignments will be penalized one letter grade per day late.

The instructions should describe exactly what we need to do in order to compile and execute your software. If we are not able to execute your software based on the instructions provided points will be deducted. You will not be given an opportunity to fix issues (so be sure to test your software and instructions on a new machine to make sure no assumptions are made on the configuration of the environment).

## Evaluation:

You have a wide range of latitude with respect to how you implement this system. You will be evaluated along several dimensions:

- Quality of your implementation: It's expected that you adhere to acceptable coding standards. The more you use generally acceptable practices as opposed to just "hacking" the solution together the better you will do along this dimension. It's also expected that the system works. A fully working system is better than a partially working system, a partially working system is better than a system that builds but doesn't execute, and so forth.
- Understanding: You'll be evaluated based on your level of understanding with respect to what you've implemented and the impacts of these solutions. These will be discussed orally after you submit your assignment.