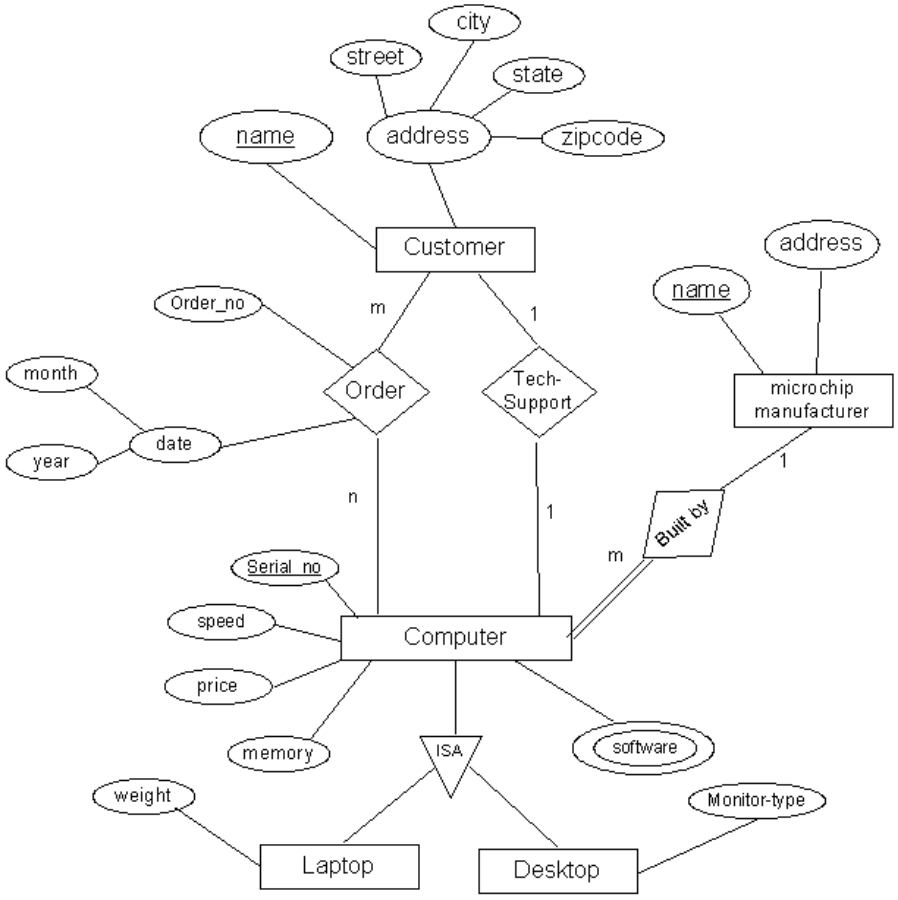
**CS 5513 - Spring 2019- Homework 2**
**Assigned: 3/12/2019**
**Due: 3/28/2019 by 3:00 PM to the class website**
**Maximum Points: 75 points**

**Notes:**

- **Homework answers must be typed and submitted by 3:00 PM to the class website; do not put your work under my/TA's door or in my/TA's physical/email mailbox; otherwise it will not be graded.**
- **Homework is individual work; it must be done by you only, no collaboration with anyone else is allowed.**
- **Late homework will be accepted until 11:59 PM on the date following the due date with 5% (of the maximum points) penalty. Late homework submitted after this time will not be graded.**

Given the following ER diagram and queries for a computer store database application, implement and test the application according to the instructions given in the "Required Implementation and Testing" section.

**ER Diagram:**



**Queries:**

1. Insert a microchip manufacturer.
2. Insert a laptop/desktop built by a particular microchip manufacturer.
3. Insert a customer who ordered a particular computer.
4. Give technical support to a computer ordered by a particular customer.
5. Find all laptops ordered by a particular customer in a particular year.
6. List all the information of the customer(s) who have technical support for a computer using the microchip manufactured by a particular manufacturer.
7. List the names of all customers who ordered a laptop running a particular operating system.
8. Find the names of all customers who have bought a desktop that costs more than a particular price.
9. Display all the software a particular laptop has.
10. Delete all customers who have not made any order since a particular year.

**Required Implementation and Testing:**

- Using the above ER diagram and queries for a computer store database application, implement this application as a Web object-relational database application that uses JSP, JDBC and Oracle 18c Object-Relational database system to do the following:
    - Create a login Web page for Oracle users to enter their Oracle username and password in order to access your Web object-relational database application.
    - Create a menu Web page that lists all the queries (1-10). For each query Web page, create a link or button to go back to the menu Web page.
    - Implement the queries (1-10). You must make use of the object-relational features of Oracle 18c whenever possible. If you implement this problem as a pure relational database application, you will NOT get more than 30 points (which is 40% of the maximum 75 points) for this homework assignment.
- Use your own dataset to populate the tables.
- The result of each of the queries (1-10) must be displayed on the Web after the query execution.
- Test your program as follows: queries (1-3): run at least 5 times for each query with different parameter values each time; queries (4-8): run at least 2 times for each query with different parameter values each time; and queries (9-10): run at least 2 times for each query with different parameter values each time.
- Submit all the following files and results to the class website:
    - Your SQL file(s) showing the creation of object types and tables,
    - Your SQL file(s) to populate the database (if any),
    - Your Java and JSP files and the query results (the snapshots of the output on the Web).
- Keep a copy of all your files and results in your directory. To check if your program works correctly, we will have an online demonstration. The exact time and date for the online demonstration will be announced later. You MUST NOT modify your files or results after you turned them in. You will get a zero grade for this homework assignment if you violated this rule.

**Important notes**:

- All of your files must be well documented. Your work will be graded based on correctness as well as documentation.
- Before working on this homework assignment, you should have understood the examples of Object-Relational database applications and the examples of Web database applications (including Lecture Topic 6–Web Databases-Parts 1, 2 and 3) on the class website and review the references

listed below.

1. **Connecting to Oracle 18c via JSP using Eclipse Instructions** (available on the class website)
2. **References for Oracle Database 18c Object-Relational Developer's Guide** (also available on the class website): https://docs.oracle.com/en/database/oracle/oracle-database/18/adobj/object-relational-developers-guide.pdf
3. **References for Oracle Database 18c 2 Day + Java Developer's Guide** (also available on the class website): https://docs.oracle.com/en/database/oracle/oracle-database/18/tdpjd/2-day-java-developers-guide.pdf