## Faculty of Engineering, Environment and Computing
## 7051CEM - Web Applications and AI

## Assignment Brief 2021/22

| Module Title<br>Web Applications and AI | Ind/Group<br>Individual | Cohort<br>(Sept/Jan) | Module Code<br>7051CEM |
|---|---|---|---|
| Coursework Title (e.g. CWK1)<br>Java EE e-Commerce Application | | | Hand out date: /2023 |
| Lecturer<br>Dr. Nazaraf Shah | | | Due date: /23 |
| Estimated Time (hrs): 40<br><br>Word Limit*:NA | Coursework type:<br>Application development and report on the development process | | % of Module Mark<br>100% |

Submission arrangement online via Aula:
File types and method of recording:

1. Zip file containing application code and report. The report should contain the link to the demo video. (Submission via Aula's Submission link)

2. A demo video of not more than 5 minutes showing the order submission process with a brief explanation. (Upload on OneDrive or University's GitHub and provide the link in the report.

Mark and Feedback date:
Mark and Feedback method: Aula

Module Learning Outcomes Assessed:

1. Understand and apply emerging web technologies and artificial intelligence (AI) techniques to enhancing the web applications development.

2. Evaluate and apply appropriate computer-based tools and platforms for the development of web-based distributed systems.

3. Appreciate the design principles and application of SOAP and REST based web services in web applications context.

4. Produce a well-engineered and robust web applications solution using a combination of Java EE technologies, Application Programming Interfaces (APIs) and machine learning models.

5. Demonstrate the ability to deploy and manage web applications on servers and a cloud environment.

Task and Mark distribution:
**Task**

Tim has started a small business called “Clothes 4 Men”. He wants to sell items online only. You are asked to develop an online store for Tim. The developed application should enable customers to view available items and buy clothes and accessories online like other traditional e-commerce shops. You are also required to provide an administrative interface so Tim could keep track of customers’ orders and perform various updates functions on orders and products in the database. You are required to use JEE Platform (Servlet, JSP, Web Services,etc.) and a relational database of your choice as implementation technologies. The application should be easy to navigate and allow easy placement of the order by multiple customers at the same time.

Part A

Your application must have the following minimum functionalities.

- Display a list of items available based on different categories to the customers.
- Allow customers to add items to their shopping carts.
- Allow removal of items from the shopping cart.
- Update item quantities in the shopping cart as a customer add an item to the cart.
- Customers can view a summary of all items and quantities in the shopping cart including order’s total value.
- Enable a customer to place an order and make payment by using fictitious credit card details (You may use any available plugin for this purpose or 10 digits number validation for credit card).
- Administrative interface is required to allow staff to view and track customers’ order; and also allow staff to add new items in stock and update their quantities.

- Backend-database should be updated correctly in relation to orders placed and products delivered.
- Ensure the validation of input data

Part B

Assuming you have the following sales data and its associated advertisement budget.
Using an appropriate regression technique predict the sale of the year 2024 if the advertising budget for 2022 is increased by 20% as compared to its previous year. Also, provide the rationale behind the selected method.

| Year | Advertising Cost | Yearly Sale |
|---|---|---|
| 2016 | 225 | 12000 |
| 2017 | 240 | 12445 |
| 2018 | 245 | 12556 |
| 2019 | 250 | 12500 |
| 2020 | 275 | 12787 |
| 2021 | 280 | 12856 |
| 2022 | 280 | 13010 |
| 2023 | 290 | 13020 |

Report:

You must also submit a report on the system describing the features that you have incorporated and reflection on the development process. The report should include:

- Use case scenarios and their UML representation of the application
- Application design (Design patterns, ER diagram, wireframes, and sketches, etc.).
- A brief evaluation report of not more than 1-page reflecting the development process and technologies used
- Evidence of implementation (e.g. screenshots, code, database, test plan, and test results) of the application
- Part B: Sale prediction and rationale of the use of the selected method

## Marks Distribution Table:

| Product | %Mark |
|---|---|
| Use case scenarios and their UML representation | 10 |
| Application design (Design patterns, ER diagram, wireframes and sketches etc.). A brief evaluation report not more than 1 page reflecting development process and technologies used | 15 |
| Correct use of appropriate technologies (JSP, Web Services, Servlet, JavaServer Faces, Java Beans, JDBC etc.) | 10 |
| Evidence of implementation (e.g. screen shots, code, database, test plan and test results) of the application. | 50 |
| Sale prediction (part b) | 05 |
| Application demonstration | 10 |

Notes:

1. You are expected to use the CUHarvard referencing format. For support and advice on how this students can contact Centre for Academic Writing (CAW).
2. Please notify your registry course support team and module leader for disability support.
3. Any student requiring an extension or deferral should follow the university process as outlined here.
4. The University cannot take responsibility for any coursework lost or corrupted on disks, laptops or personal computer. Students should therefore regularly back-up any work and are advised to save it on the University system.
5. If there are technical or performance issues that prevent students submitting coursework through the online coursework submission system on the day of a coursework deadline, an appropriate extension to the coursework submission deadline will be agreed. This extension will normally be 24 hours or the next working day if the deadline falls on a Friday or over the weekend period. This will be communicated via email and as a CUMoodle announcement.

Marking Criteria

| Product | Pass mark | Distinction Mark |
|---|---|---|
| A description of the application and | Adequate | Excellent |

| | | |
|---|---|---|
| use case scenarios | descriptions but the may be some relevant parts missing, lack of clarity or inconsistencies with other parts of the work. | description, Very clear. Few mistakes and if any these should be minor |
| Design | Reasonable design, may be some inconsistencies, ambiguities or incompleteness but gives the picture of the systems overall. | Very clear and detailed design using appropriate diagrammatic method |
| Evidence of implementation the of application | Some screen shots and test plans included with comments. Some functionalise working<br>May not be fully implemented. | Comprehensive set of screen shots and test plan. Test results Everything working correctly. Demonstration should cover all aspects of system |
| Correct use of appropriate technologies | Satisfactory understanding and use of a J2EE technology component | Correct use and understanding of , JSP/Servlet, Java beans, JDBC and other Java EE advanced technologies |
| Application Demo | Demonstration lacking full functionality and understanding, acceptable user interfaces | Demonstration of correct functionality understanding and excellent user interfaces |
| Sale Prediction | Partial answer | Correct use of and rational of the use of prediction method |