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| **North West Regional College**  **School of Science, Technology & Creative Industries**  Foundation Degree Science - Software Development  **Assignment Cover Sheet** |

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| **Module Code:** | **COM476** |
| **Module Name:** | **Visual Programming and Data Structures** |
| **Assignment No:** | **2** |
| **Assignment Title:** | **Java Collections Framework** |
| **Lecturer(s):** | Peter Wisener |
| Moderator: | **Teresa Deeney** |
| **Moderation Date:** |  |
| **Release Date:** | **19/11/19** |
| **Submission Date:** | **20/12/20** |

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| **Learning Outcomes Covered by Assignment** | K1, K2, I1, I2, P1, P2, T1, T2, T4, T5, T6 |

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| **Definition of Plagiarism:** | Plagiarism is the act of taking or copying someone else’s work, including another student’s, and presenting it as if it were one’s own. Plagiarism is said to occur when ideas, texts, theories, data created artistic artifacts or other material are presented without acknowledgement so that the person considering the work is given the impression that what they have before them is the student’s own work when it is not. Plagiarism also occurs when a student’s own work is re-presented without being properly referenced. Plagiarism is a form of cheating and is a disciplinary offence. |

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| **Student Declaration:** | I declare that this is my own work and that any material I have referred to has been accurately and consistently referenced. I have read and understand the definition of plagiarism given above. If it is shown that material has been plagiarised, or I have otherwise attempted to obtain an unfair advantage for myself or others, I understand that I may face sanctions. A mark of zero may be awarded and the reason for that mark will be recorded on my file. | | |
| **Student Name:** |  | | |
| **Student Signature:** |  | | |
| **Date Submitted:** |  | | |
| **Mark:** |  | | |
| **Assessor:** | **Peter Wisener** | **Date:** |  |

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| **For Internal**  **Moderation Purposes Only** | **Sampling Date** | **Moderator** | **Signature** |
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**For the problem below you should use appropriate data structures from the Java Collections Framework and create a menu driven graphical user interface to solve the problem.**

**Part A One World Health Products**

One World Health is a business that sells health products to the public and various health clubs across Northern Ireland. They group the products they sell into the following categories:

* Beauty
* Food
* Sports nutrition
* Vitamins
* Weight loss

They require a stock control system to keep track of sales and stock for the various products they sell.

You should make use of at least two data structures from the Java Collection Framework in implementing the system. It requires a data structure to store the products and a data structure to store the sales made. You may also wish to consider a data structure to store items in a basket before a sale is made.

**Products Stock Reports System**

**Add Product Display Stock Low Stock Items Exit**

**Update Product Make Sale Products By Category**

**Delete Product All Sales**

All menu options must be implemented using suitable JFrame extended classes.

*Guidance:*

The **Product** class should include the following attributes:-

int productID

String name, size, category

int noSold, stockLevel

double unitPrice

The **Sale** class should include the following attributes:-

int saleID

String customerName

LocalDate (or MyDate) dateSold

double totalPrice

String productCodes – lists the code(s) each product in the sale

The Make Sale option could allow the user to search for the product using the productID or select using the category and name (your choice rather than the user’s). Once the item is found, a button should be used to record a sale, reducing the stock level and increasing the sales for that item. The form may allow more than one item to be processed in the sale.

The **Low Stock Items** report should allow the user to select the category and view the products for that category that have fewer than 10 units in stock. It should be displayed on screen and exported to a text file using the category name and date eg Food13-11-19.

The **Products By Category** report should show all products grouped by category and include appropriate totals. It should be displayed on screen and exported to a text file.

The **All Sales** report should show a list of all sales made and should also be exported as a text file.

NB: By establishing and implementing appropriate validation criteria ensure only valid product details are processed. (Add and Update Options)

NB: Using Serialization read the Data Structure Objects from files when the system opens and write them back to files before exiting the system.

**You should also produce a concise user document explaining how to use the system in simple terms, demonstrating any possible errors that could occur.**

**Part B**

Describe the role and structure of the Java Collections Framework and evaluate the functionality and efficiency of the HashMap and LinkedList classes. You may wish to refer to the following:

* Interfaces, Abstract/Concrete Classes
* Constructors
* Key methods
* Advantages / Disadvantages of each

**Submit by Email to peter.wisener@nwrc.ac.uk**

1. Software (Project folder in .zip format)
2. User Documentation
3. LinkedList vs HashMap Documentation

**Marking Scheme**

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| **Part A** | | | |
| GUI Interface Design |  | 10 |  |
| Input / Output |  | 10 |  |
| Validation |  | 10 |  |
| Use of Java Collection objects |  | 10 |  |
| Event driven code |  | 20 |  |
| Display / Reports |  | 10 |  |
| User Documentation |  | 10 |  |
| **Total** |  | **80** |  |
| **Part B** |  | 20 |  |
|  | | **100** |  |