University of Westminster
School of Computer Science and Engineering

5BUIS018W, "BIS Development" (2023/24)	
Module leader	Abarnah Kirupananda
Unit	Individual Coursework
Weighting:	60%
Qualifying mark	30%
Learning Outcomes Covered in this Assignment:	LO1 Demonstrate a good understanding of the object-oriented paradigm; LO2 Apply object-oriented principles to the design of a medium scale business system; LO3 Develop a prototype to show how specifications of a given set of requirements of a medium-scale business can be implemented using appropriate object-oriented programming language; LO4 Categorise and analyse different ways data is stored, managed and used in modern business computing applications; demonstrate understanding of different data servers and write SQL statements addressing medium-scale business requirements; LO5 Engage confidently in academic and professional discussions, to reflect on their object-oriented design knowledge and provide justified advice for the development of object-oriented applications for business systems.
Handed Out:	**Week 4**
Due Date	**Thursday 11 April 2024, 13:00pm (week 12)**
Expected deliverables	**Blackboard**: Single electronic file that must include tdeveloped code for Part A; the answers for part B; in appendix the code for part A. Please see the details in the section "Submission".
Method of Submission:	Electronic submission via Blackboard (one file); upload code to University's server
Type of Feedback and Due Date:	• Verbal feedback during the tutorials • Written feedback and marks 15 working days (3 weeks) after the deadline. **All marks will remain provisional until formally agreed by an Assessment Board.**

BCS Criteria meeting in this assignment	2.1.3 Problem solving strategies 2.1.4 Analyse if/how a system meets current and future requirements 2.1.5 Deploy theory in design, implementation and evaluation of systems 2.2.1 Specify, design or construct computer-based systems 2.2.4 Deploy tools effectively 3.1.2 Methods, techniques and tools for information modeling, management and security 4.1.1 Knowledge and understanding of scientific and engineering principles

Penalty for Late Submission

If you submit your coursework late but within 24 hours or one working day of the specified deadline, **10 marks** will be deducted from the final mark, as a penalty for late submission, except for work which obtains a mark in the range 40 – 49%, in which case the mark will be capped at the pass mark (40%). If you submit your coursework more than 24 hours or more than one working day after the specified deadline you will be given a mark of zero for the work in question unless a claim of Mitigating Circumstances has been submitted and accepted as valid.

It is recognised that on occasion, illness or a personal crisis can mean that you fail to submit a piece of work on time. In such cases you must inform the Campus Office in writing on a mitigating circumstances form, giving the reason for your late or non-submission. You must provide relevant documentary evidence with the form. This information will be reported to the relevant Assessment Board that will decide whether the mark of zero shall stand. For more detailed information regarding University Assessment Regulations, please refer to the following website: **http://www.westminster.ac.uk/study/current-students/resources/academic-regulations**

Introduction

In this coursework, you are expected to use your knowledge of object-oriented (OO) programming in order to construct functional components of a web application. You will be creating a prototype to show how specifications of a given set of requirements of a business, can be implemented using Object Oriented (OO) PHP and MySQL. Furthermore, you are asked to prepare a report where you will explain and discuss how your code meets the specifications of the given scenario and demonstrate your understanding of the OO programming concepts that you have implemented.

Business description: “OrganicSnacks”

“OrganicSnacks” is a well-established high-street store. Recently, the owner decided to get web presence. Currently, only a limited number of products are available on the web site.

Products that are sold via the web site are:

Protein Bars
Mini Rice Cakes
Wholegrain Seed Crackers
Peanut Butter Cookies

For each product the following information is provided:

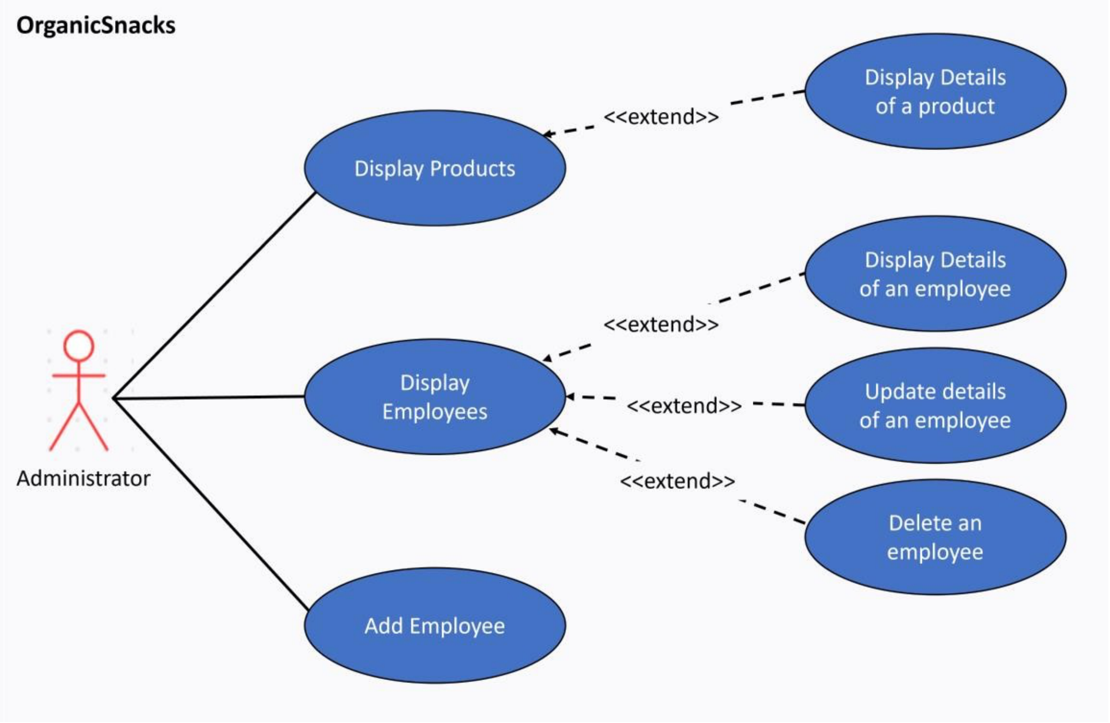
Name
Description
Price

The owner is the general administrator of the website. There are also two employees who could make changes to the website. For each employee the system holds the following information:

Name
Email Address
Username
Mobile Number

For the needs of this assessment, we’ll limit the actions the administrator could take to the following. The administrator has access to products and to employees. The administrator can see all products that are available on the website and the details of each product as well as the names of all employees, and the details of each employee. Furthermore, the administrator can update the details of an employee, add a new employee, and delete an existing employee.

The following figure is the use case diagram, limited to the scope of this assessment, that shows what an administrator can do.



Based on the above description, you are asked to complete the following tasks, organized in part A and part B.

Part A asks you to implement a console system to be used by the administrator, in order to manage products and employees, according to the above use case diagram.

Part B asks you to explain and discuss further some specific sections of your implementation for part A.

Part A: Implementation TOTAL: 55 marks

Note: You must upload all the files containing your code for Part A, to University's server and clearly provide the address where your website can be accessed. The website must remain available, at least, till the results are officially announced by the Registry. Furthermore, ALL your code must be included in the appendix of the report you upload on Blackboard.

Using OO PHP and MySql, implement a console system to be used by the administrator to manage the details of products and employees. More specifically, in your implementation, you must address the following:

A1. Preparation and organization of the site [15 marks]

a. Create your database with all the necessary tables and populate them with the following data *[6 marks]:*

Products

Name	Description	Price
Protein Bar	Healthy protein bars – they are delicious and packed with healthy ingredients.	£12

Mini Rice Cakes	Mini rice cakes are low in calories and fat.	£8
Wholegrain Seed Crackers	Whole grains are a good source of nutrients such as B vitamins and iron.	£7
Peanut Butter Cookies	Peanut butter cookies taste great, and they are healthy.	£10

Employees:

Name	Email	Username	Mobile number
James White	james@organicsnacks.com	jamesw	0791111111
Ann Blue	ann@organicsnacks.com	annb	07922222222

b. Create the basic site layout of your site (you could adopt the same template that we have used in the lectures/tutorials, making the necessary changes). You do **not** get extra marks for design elements (e.g., pictures, background etc.). When you call the site, a welcome message should appear on the screen and the following management options should appear at the navigation bar: 'Display Products"; "Display Employees"; "Add New Employee". *[4 marks]*

c. Organize your project using the appropriate structure and folders. Make sure you keep the project tidy. *[3 marks]*

d. Connect your site to your database. *[2 marks]*

A2. Create the necessary classes **[15 marks]**

Create all the necessary classes for implementing the console management system, according to the above description. For full marks, you are expected to **optimize** your code and create a "database class". If no "database class" is created, a penalty of **7 marks** will apply.

A3. Display products and employes on the screen **[4 marks]**

When the administrator clicks the option "Display Products" at the navigation bar, all product names should be displayed on the screen. Similarly, when the administrator clicks the option "Display Employees" at the navigation bar, all employees' names should be displayed on the screen.

A4. Display specific details for a product and an employee **[4 marks]**

When the administrator clicks the name of a product, a new page should be generated, where all the details of this specific product (name, description, price) are presented. Similarly, when the administrator clicks the name of an employee, a new page should be generated, where all the details of this specific employee are presented (name, email, username, mobile phone).

A5. Add, delete, update **[12 marks]**

Furthermore, the administrator must be able to perform the following actions:

- **add** a new employee *[4 marks]*
- **delete** an existing employee *[2 marks]*
- **update** the details of an employee (e.g., modify the email or the mobile number of an employee) *[6 marks]*

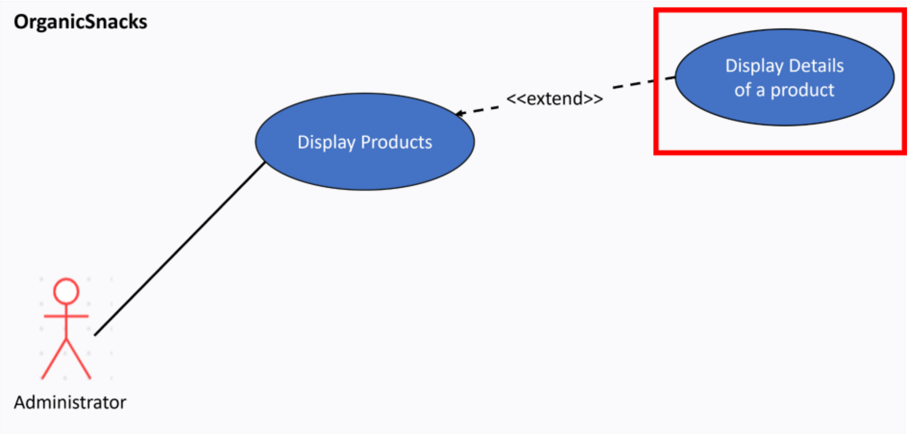
A6. Comments **[5 marks]**

Inside your code, you must provide meaningful comments to explain it. They must be your own comments. If you just copy the comments from the tutorial files, then you will get no marks for the comments.

Part B: Explanation – Discussion TOTAL: 45 marks

Answer the following questions. The recommended word count for **each** answer is 300 to 350 words. Maximum word count is 350.

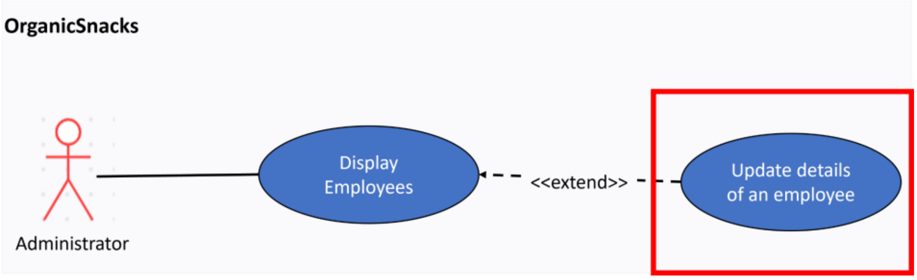
B1. Consider the following case of the above use case diagram. **[20 marks]**



Present and explain the function(s) you created in order to implement the case "Display Details of a product" (marked in red). In your answer you must include the following:

a) the code where the above case is implemented. You could either make **specific** reference to the code you include in the appendix e.g. file "xxx.php", lines 1-10, 30-40 etc, or copy and paste the code here. The code will not be counted in the word limit. *[5 marks]*
b) briefly explain what **each line** of the code does. *[8 marks]*
c) explain why your implementation is "**object oriented**" and what principles of "object oriented" approach are used. *[7 marks]*

B2. Consider the following case of the above use case diagram. **[25 marks]**



Present and explain the function(s) you created in order to implement the case "Update Details of an employee" (marked in red). In your answer you must include the following:

a) the code where the above case is implemented. You could either make **specific** reference to the code you include in the appendix e.g. file "xxx.php", lines 15-23, 35-50 etc, or copy and paste the code here. The code will not be counted in the word limit. *[6 marks]*

b) briefly explain what **each line** of the code does. *[12 marks]*

c) explain why your implementation is "**object oriented**" and what principles of "object oriented" approach are used. *[7 marks]*

SUBMISSION

You must submit the following:

Files created for the implementation (part A), e.g., .php files, .html files, .css etc.

On Blackboard, you must submit ONE SINGLE file that consists of the following sections:

a) The Files created for Part A

b) The answers to **Part B** (each answer is expected to be between 300-350 words)

c) **APPENDIX** with the code: here you must include all your code that you have developed

Further instructions

- All PHP, HTML, CSS and/or other files and answers for part B should be added to a zip file.
- On Blackboard, you must submit only **ONE file,** as described above.
- Your final mark depends on the quality of your answer. Readability of code and use of descriptive, non-confusing names improve the quality.
- DO NOT FORGET: **Plagiarism** is a very serious offence. The University takes cases of plagiarism very seriously. If you are caught plagiarising, you will face disciplinary procedures which could ultimately result in your expulsion. Please refer to the Student Handbook for a clarification of what constitutes plagiarism.

Marking Scheme

Criteria	Mark per component	Mark provided	Comments
PART A – Implementation	**55 marks**		
A1 a) Create the database tables 6 marks b) Site layout 4 marks c) Site organization 3 marks d) Connection with the database 2 marks	**15**		
A2 Create the necessary classes. Full marks if “database class” is used to optimize the code. 15 marks No “database class” → 7 marks penalty	**15**		
A3 Display products and employees on the screen [2 marks each]	**4**		
A4 Display specific details of a product and of an employee [2 marks each]	**4**		
A5 • add a new employee [4 marks] • delete an existing employee [2 marks] • update the details of an employee [6 marks]	**12**		
A6 Comments *	**5**		
PART B – Report	**45 marks**		
B1 Use case: “Display Details of a product.” a) the code where the above case is implemented. Give specific reference to the code in the appendix or include the code *[5 marks]* b) briefly explain what each line of the code does. *[8 marks]* c) explain why your implementation is “object oriented” / “object oriented” principles used. *[7 marks]*	**20**		

B2 Use case: "Update details of an employee." a) the code where the above case is implemented. Give specific reference to the code in the appendix or include the code here. *[6 marks]* b) briefly explain what each line of the code does. *[12 marks]* c) explain why your implementation is "object oriented" / "object oriented" principles used. *[7 marks]*	**25**		
TOTAL	**100**		

*** About comments**: You are expected to provide meaningful comments inside your code, to explain it. All main actions (e.g., functions) are expected to be commented. They must be your own comments. Only correct comments get marks. If you just copy the comments from the tutorial files, you get NO marks.