INTERNATIONAL SCHOOL OF MANAGEMENT AND TECHNOLOGY

NEPAL

FACULTY OF COMPUTING

UNIT TITLE	Unit 1: Programming		
UNIT CODE	H/618/7388	LEVEL	4 (Core)
STUDENT NAME		CREDIT VALUE	15
ASSESSMENT TITLE	Introduction to Algorithms and Programming with an IDE	WORD COUNT	
ASSESSOR	Binod Shah	I.V.	
ASSIGNMENT ISSUE DATE	21/05/2023	ASSIGNMENT SUBMISSION DATE	20/07/2023
ORIGINAL SUBMISSION		ASSIGNMENT NO.	1

ASSESSMENT CRITERIA TO BE ASSESSED IN THIS ASSIGNMENT

(Identify all criteria to be assessed in this assignment)

Assignment Criteria	P1	P2	P3	P4	P5	P6				
Achieved										
	Merit Criteria						**Distinction Criteria**			
Assignment Criteria	M1	M2	M3	M3	M4		D1	D2	D3	D4
Achieved										

Important:

- **Read the plagiarism notice and requirements at Page 7**
- **Word-limit- 8000 words** *(excludes cover page, table of content, figures, graphs, reference list, appendix and logbook)*
- **Accepted Sources: Research Papers** *(Journal Articles, Conference Proceedings, Thesis), Text Books, Governmental Data, Websites (only a registered organization, an educational institution, government agency)*
- **Information taken from unreliable sources will not be accepted**
- **Must follow Harvard Reference Style**
- **Assignment must be submitted through the Plagiarism Detection Tool**

Assignment submission format
Each student has to submit their assignment as guided in the assignment brief. The students are guided on what sort of information is to produce to meet the criteria targeted. You are required to make use of headings, paragraphs, and subsections as appropriate, and all work must be supported with research and referenced using the **Harvard referencing system**.

Learning outcomes covered
• LO1 Define basic algorithms to carry out an operation and outline the process of programming an application • LO2 Explain the characteristics of procedural, object-orientated and event-driven programming • LO3 Implement basic algorithms in code using an IDE • LO4 Determine the debugging process and explain the importance of a coding standard.

ASSIGNMENT SCENARIO

Scenario
You have just started a new role as a Junior Software Developer at Himalayan Digital Solutions (HDS), an independent software development company that designs and builds bespoke software solutions for various companies of different sizes that cover a range of different industries. The software that they design uses a wide range of technologies, from simple stand-alone programs to large web-based applications. HDS has been approached by a small, local company – Best Fitness – that specializes in providing fitness training sessions to people from the local community. Best Fitness caters to people of all ages and experience, from expert to beginner. Best Fitness has requested a simple program that will calculate the cost of training fees for their clients each month. The CEO of the company has reviewed the client requirements and has determined that this is a suitable project for you to take on. The company wants to see how you use and apply the HDS development environments and code standards. The requirements are that Best Fitness wants a program that will allow a user to enter the following information: Customer name, training plan, current weight in kilograms (kg),

Target weight category, sauna option (extra cost), option to add the number of hours private coaching. For each athlete, the program should then output the following information: the customer's name, an itemized list of all costs for the month, the total cost of training, for the month, how their current weight compares to their target weight.

Best Fitness currently has six athletes enrolled on their training program, but they would like the ability to register more. You should use the additional information on the next page to help you when developing your program. The client has not specified any Graphical User Interface, but the CEO has left the design of the program completely up to you. Once the program has been built, the CEO has asked you to report back to them on how you designed and developed the algorithms required, as well as how you converted these algorithms into a final program and to show any issues you encountered. As part of your report, the CEO wants you create a presentation for the development team showing the different programming paradigms available, as well as the debugging tools you used as part of the program development, so that the development team can review your progress.

Additional Information:

Training Plan - Prices (NPR)	
Beginner (2 sessions per week) - Weekly Fee	1000
Intermediate (3 sessions per week) - Weely Fee	2000
Elite (more than 5 sessions per week)- Weekly Fee	3000
Private Trainer - per hour	500
Sauna - Per session	1500
Swimming - Per session	500

- All prices and costs should be displayed as currency to two decimal places
- The program deals with user error by displaying suitable messages to the user and then prompting them for another go
- Best Fitness assumes that a month consists of four weeks

ASSIGNMENT TASKS

Assignment Task

Activity 1

Produce a formal presentation (with supporting notes) for HDS that explores the features and characteristics of the three different programming paradigms – Event Driven, Object Oriented and Procedural – in a selected application. The selected application source code will need to implement all three paradigms.

Your presentation should include:

- a brief explanation about what the selected application is and what it does
- a general discussion of the three code paradigms, with specific reference to their characteristics and how each one is related
- a comparison of how the three programming paradigms have been used in the given application source code
- a critical evaluation of how the source code implements all three paradigms in terms of code structure and characteristics

Activity 2

You are required to develop a program for Best Fitness that makes use of appropriate algorithms to fulfil the given client requirements. You should make use of whichever tools and techniques are most appropriate for your chosen coding paradigm and for the nature of the software solution.

You are to write a report that details the process that would be required to design the algorithm for the solution and how you turned the algorithm into a working application.

Your report should include the following.

- A definition, written in the design tool of your choosing, of the algorithm required for the implementation of the Best Fitness program
- An outline of the steps required to build the application
- A description of the steps required for converting the algorithm into a working program, including identification of a suitable programming language
- An analysis of the relationship between the algorithm and program code to be produced (e.g. parts of the algorithm that would remain the same, changes that would have to be made)
- An analysis of the possible challenges you would face when converting the designed

algorithm into program code (e.g. data types/structures available in the chosen language, control structures required)
- An explanation of the coding standards you used in your source code

As part of your written report, you should clearly show how you have enhanced your original algorithm, using the features of the IDE to manage the development process. This could include:

- identifying and solving any logical errors in the original algorithm
- debugging any errors in the program

Activity 3

Produce a formal presentation (with supporting notes) for HDS that explains the debugging features available to the developer in your chosen IDE and how they have been used in the development of the solution for Best Fitness.

Your presentation should include:
- a brief description of the IDE chosen for this project
- an explanation of the debugging process
- an explanation of the debugging features available in your chosen IDE
- an examination of how the debugging process can be used to develop more secure and robust applications.

Activity 4

You are to write an evaluative report for the CEO of HDS that provides a reflective overview of how the process evolved, from algorithm design to implementation, and how the use of the IDE and code standards are important for working in a company like HDS.

Your report should include:
- an evaluation of how the algorithm you designed for Best Fitness was finally implemented
- an evaluation of the relationship between the written algorithm and the actual source code
- an evaluation of the use of the IDE you chose to develop the Best fitness application. As part of your evaluation, you will need to consider what the development would have been like if you did not have access to the IDE
- an evaluation of the role and purpose of the coding standards you used, making specific reference to why it is necessary for software development teams as well as individual programmers.

LEARNING OUTCOMES AND ASSESSMENT CRITERIA

<table>
<tr><th>Pass</th><th>Merit</th><th>Distinction</th></tr>
<tr><td colspan="2">LO1 Define basic algorithms to carry out an operation and outline the process of programming an application</td><td rowspan="2">D1 Evaluate the implementation of an algorithm in a suitable language and the relationship between the written algorithm and the code variant.</td></tr>
<tr><td>P1 Define an algorithm and outline the process in building an application.

P2 Determine the steps taken from writing code to execution</td><td>M1 Analyse the process of writing code, including the potential challenges faced</td></tr>
<tr><td colspan="2">LO2 Explain the characteristics of procedural, object orientated and event-driven programming</td><td rowspan="2">D2 Critically evaluate the source code of an application that implements the procedural, object orientated and event-driven paradigms, in terms of the code structure and characteristics.</td></tr>
<tr><td>P3 Discuss what procedural, object-orientated and event-driven paradigms are; their characteristics and the relationship between them.</td><td>M2 Compare the procedural, object orientated and event driven paradigms used in given source code of an application.</td></tr>
<tr><td colspan="2">LO3 Implement basic algorithms in code using an IDE</td><td rowspan="2">D3 Evaluate the use of an IDE for development of applications contrasted with not using an IDE.</td></tr>
<tr><td>P5 Write a program that implements an algorithm using an IDE.</td><td>M3 Enhance the algorithm written, using the features of the IDE to manage the development process.</td></tr>
<tr><td colspan="2">LO4 Examine the need for Continuing Professional Development (CPD) and its role within the workplace and for higher level learning</td><td rowspan="2">D4 Evaluate the role and purpose of a coding standard and why it is necessary in a team as well as for the individual.</td></tr>
<tr><td>P5 Explain the debugging process and the debugging facilities available in the IDE.

P6 Explain the coding standard you have used in your code.</td><td>M4 Examine how the debugging process can be used to help develop more secure, robust applications.</td></tr>
</table>

Plagiarism Notice

You are reminded that there exist **Academic Misconduct Policy and Regulation** concerning **Cheating and Plagiarism**.

Extracts from the Policy:

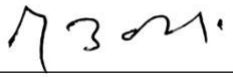
Section 3.4.1: Allowing others to do assignments / Copying others assignment is an offence

Section 3.4.2: Plagiarism, using the views, opinion or insights / paraphrasing of another person's original phraseology without acknowledgement

Requirements

- It should be the student's own work – **Plagiarism is unacceptable**.
- Clarity of expression and structure are important features.
- Your work should be submitted as a **well presented**, word-processed document with headers and footers, and headings and subheadings.
- You are expected to undertake research on this subject using books from the Library, and resources available on the Internet.
- Any sources of information should be **listed as references** at the end of your document and these sources should be referenced within the text of your document using **Harvard Referencing** style
- Your report should be illustrated with screen-prints, images, tables, charts and/or graphics.
- All assignments must be typed in **Times New Roman**, **font size** 12, 1.5 **spacing**.

The center policy is that you must submit your work within due date to achieve "Merit" and "Distinction". Late submission automatically eliminates your chance of achieving "Merit and Distinction". Also, 80% attendance is required to validate this assignment.

Assignment Prepared By	**Signature**	**Date**
Sheela Paudyal		11/01/2023
Brief Checked By	**Signature**	**Date**
Dhruba Babu Joshi		13/01/2023