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| **Programming II**  Diploma in IT / DS / CSF  Year 1 (2021/22) Semester 2 | Week **1** |
| **1** hour |
| **Practical 1a: Writing C# Programs (Part 1)** | |

**OBJECTIVES**

At the end of this exercise, you should be able to implement C# programs involve

* Selection structure
* Repetition structure
* List / Array
* Methods

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| **IMPORTANT**   * Create a folder, **Week01(Part1)**, in your hard disk. * For each question, you will be creating a new Console Application project, **Snnnnnnnn\_Question##**, in the **Week01(Part1)** folder created above *(note:* ***Snnnnnnnn*** *is your Student Number and ## is the question number).* Type the program in the Program class of each project. * At the end of the session, copy the folder **Week01(Part1)** folder (which contains all your work) to PRG2 network folder: **\\ictspace.ict.np.edu.sg\PRG2** |

1. BMI Calculation

The Body Mass Index (BMI) of a person is calculated based on the following formula:

BMI = weight / ( height x height )

Note

* weight is in kilograms (e.g. 65.0)
* height is in metres (e.g. 1.70)

Write a C# program to:

- prompt the user to enter his/her weight and height

- calculate the BMI (body mass index)

- display the BMI and the health category according to the table below:

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| **BMI** | **Health category** |
| Below 18.5 | Under weight |
| Between 18.5 and 23 (exclusive) | Normal weight |
| Between 23 and 27.5 (exclusive) | Over weight |
| Above 27.5 | Obese |

A sample output is shown below (values underlined are the user input):

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| Enter your weight (kg): 65.0  Enter your height (m): 1.72  Your body mass index is 21.971335857220122  You are Normal weight. |

1. Discount Calculation [using nested if]

The discount rate given by a shopping mall is shown below:

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| --- | --- |
| **Amount spent ($)** | **Discount Rate (%)** |
| 100 and below | 0 |
| 100 < amount <= 500 | 5 |
| 500 < amount <= 1000 | 10 |
| Above 1000 | 20 |

Write a C# program to:

- prompt the user to enter the amount spent

- calculate and display the discount given (in percentage)

- calculate and display the discount amount

Two sample outputs are shown below (values underlined are the user input):

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| Enter amount ($) : **200.00**  Discount given (%) : 5  Discount amount($) : 10.00 |

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| Enter amount ($) : **1000.00**  Discount given (%) : 10  Discount amount($) : 100.00 |

1. Multiplication Table [using repetition structure]

Write a C# program to display the multiplication table for a given number from 1 to 12 as shown below (value underlined is the user input):

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| Enter a number : **8**  1 8  2 16  3 24  4 32  5 40  6 48  7 56  8 64  9 72  10 80  11 88  12 96 |

1. Admin Menu [using methods, loop & nested if]

Write a C# program that display the main menu as shown below.

Convert the program done in the 3 questions above into methods, call the corresponding method when the user enters the option between 1 and 3.

Display a message indicating that the option is invalid when the user enters any value outside the option.

The program will display the main menu repeatedly until the user enters a 0.

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| ------------- MENU --------------  [1] Calculate Body Mass Index  [2] Calculate Discount  [3] Display Multiplication Table  [0] Exit  ---------------------------------  Enter your option : 1  BMI Calculation  Enter your weight : 65  Enter your height : 1.7  Your BMI is 22.49134948096886  ------------- MENU --------------  [1] Calculate Body Mass Index  [2] Calculate Discount  [3] Display Multiplication Table  [0] Exit  ---------------------------------  Enter your option : -1  Invalid option! Please try again.  ------------- MENU --------------  [1] Calculate Body Mass Index  [2] Calculate Discount  [3] Display Multiplication Table  [0] Exit  ---------------------------------  Enter your option : 0  Bye |
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**If a student is found to have submitted work not done by him/her, he/she will not be awarded any marks for this practical. Disciplinary action may also be taken.**

**Similar action will be taken for student who allows other student(s) to copy his/her work.**