OLLSCOIL NA GAILLIMHE
UNIVERSITY OF GALWAY

Applied Customer Analytics
MS5108 2022-2023
Individual Assignment 1

Objective	The objective of this assignment is to access your understanding of the basics of R programming language.
Lecturer	**Name** / **Office** / **E-mail** Dr Umair ul Hassan / CA369 / umair.ulhassan@universityofgalway.ie
Marks Awarded	This assignment carries **20%** of the overall marks for the module.
Submission Process	You should submit your completed assignment through Blackboard's Assignment tool. Any member of a group can submit on behalf of the whole group. If you are unable to submit your assignment via Blackboard, please email it to your lecturer whilst also copying business@universityofgalway.ie in the same email and clearly state the issue that you have faced while uploading to Blackboard.
Assignment Deadline(s)	**9th February 2023 at 5:00pm Irish time:** • R code file • Report (max 2 pages) To avoid technical issues, it is strongly advised that you **upload your submission well in advance of the deadline**. You may submit at any time on any day prior to the deadline. You will have multiple attempts to submit, and last submitted version will be graded.
Late or No Submission	Blackboard will record late submissions. Except in extenuating circumstances, late submissions will carry a penalty up to 24 hrs after the deadline, after which time any submissions will not be marked. Non submission of assignment will carry a mark of zero in determination of overall marks for this sitting. There is no opportunity to resubmit continuous assessment before the next offering of the module, should student(s) fail to submit by specified deadlines.
Deliverables	The **R code** file, as "*MS5108_Assignment1_YOURNAME_code.R*" file. Include your student name, ID, and module code in the start of your code. A **report** of results, as "*MS5108_Assignment1_YOURNAME_report.docx*" file. Include your student name, ID, and module code at the start your report. Limit the report size to 2 pages with font size not more than 11 points.
Academic Integrity	Each module instructor reserves the right to follow up with a student by interview if there is any concern in relation to the integrity of the assignment.

	For any assignments not submitted via Turnitin, we reserve the right to check it using Turnitin where required.
Plagiarism	Plagiarism is the use of another person's ideas or work without appropriate acknowledgement or credit. Plagiarism may be intentional or unintentional. Intentional plagiarism is the clear intent to pass off another person's work or ideas as your own for your own gain. Unintentional plagiarism may occur if you do not understand the appropriate way to acknowledge the source of your ideas and information. If you are unsure of the acceptable methods of acknowledgment you should refer to the University of Galway Code of Practice for Dealing with Plagiarism, consult with your lecturer or the library staff. Proven plagiarism is a very serious matter which may result in severe disciplinary action and/or exclusion from the University. Ensure all assignment submissions include a signed plagiarism statement.
Referencing & Citation	Correct referencing and citation avoids plagiarism. There are varying referencing styles available but the most popular is the Harvard Referencing Style. Details on how to reference journal articles, books, electronic information and various other supports is available from the NUI, Galway Library at the following link: http://libguides.library.nuigalway.ie/c.php?g=543943&p=4591416
Blackboard Ally	Blackboard Ally supports you to access more user-friendly file formats. Please contact the lecturer if you experience any accessibility issues for this module material. Should you have a visual impairment and require the document in another format, please contact the lecturer to explore alternative format options.
Special Requirements	If you are registered with the Disability Support Service (DSS), you will find recommended accommodations listed on your Learning and Educational Needs Summary (LENS) report. If the alternative assessment offered for this module does not fully meet the recommendations in your LENS report, please email your lecturer as well as whilst also copying business@universityofgalway.ie, stating clearly how you feel the recommendations are not being met. Please ensure you attach a copy of your LENS report to this email.

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Question 1

Follow following step to create a dataset and fit a regression model.

a) Create two vectors ***x1*** and ***x2*** by taking 50 samples from Normal distribution (using the *rnorm()* function) and Exponential distribution (using *rexp()* function) respectively.
b) Then create another vector ***y*** by creating a linear combination of ***x1*** and ***x2***.
c) Convert all three vectors to a data frame and then fit a simple linear regression using the *lm()* function.
d) Report the results of regression.
e) Submit the data frame along with results. This will be used to verify your model.

Question 2

You have been given the dataset below which details the height (in metres) and weight (in kilograms) of 10 people.

Subject	Height	Weight
1	1.82	80.4
2	1.56	66.2
3	1.74	68.9
4	1.55	70.1
5	1.63	75
6	1.91	83.7
7	2.05	105.6
8	1.84	79.5
9	1.80	68
10	1.71	69.4

First convert above dataset to a data frame. Then you are required to write the R code to:

a) Calculate the body mass index (BMI) for each participant in the above dataset. *[The calculation for BMI is divide your weight in kilograms by your height in metres, then divide the answer by your height again to get your BMI.]*
b) Calculate the mean and standard deviation of height, weight, and BMI.
c) Returns all rows where the height is ≥1.70 and the weight is <70, then store them as an object called “sample”.
d) Calculate the mean and standard deviation of height, weight, and BMI from “sample”.
e) Compare the results and report.