FACULTY OF SCIENCE

ACADEMY OF COMPUTER SCIENCE AND SOFTWARE ENGINEERING

MODULE	**IFM01A1** INFORMATICS 1A: INTRODUCTION TO ALGORITHM DEVELOPMENT (VB)
CAMPUS	APK
SEMESTER TEST (SPECIAL SSA)	JUNE 2021 (PAPER E)

DATE	2021-06-17	TIME	08:00-11:00
ASSESSORS		MR K LEBEA PROF WS LEUNG	
INTERNAL MODERATOR		MS M FOURIE	
DURATION	3 Hours	MARKS	100

INSTRUCTIONS

- This question comprises three (3) pages
- Name your project using your Student Number, starting with the letter S
- The first 20 (twenty) minutes are reserved for DESIGN (you must scan your design pages and upload it with your project in a SINGLE zip file)
- Answer ALL questions
- **You MAY NOT use methods / libraries that have not been taught in class**
- **No further marks will be awarded for Correct Execution from the point your submitted program terminates unexpectedly**
- **If your submitted code does not compile, your mark will be capped at 40%**
- You are responsible for ensuring that you upload the full and final version of your submission
- You are responsible for ensuring that you save your work correctly. No additional time will be provided in the event that your machine restarts and you lose all your work
- Support through the Informatics 1A Discord Server ONLY

When you are ready to submit:

- Create a zip of your DESIGN AND ENTIRE Visual Studio project
- Upload a copy of this zip to Question 2 on Blackboard
- Upload a copy of this zip by submitting it through to this Google Form:
  - https://forms.gle/aMoEWT4oCiTjZksTA

UJ ICS is interested in knowing which department is taking up most of the storage on their Blackboard servers. They have approached you to design and develop a Visual Basic application (meant for deployment in a Windows desktop environment) to assist.

All decimal values must be displayed at exactly 4 decimal places.

0.1	Design *(Input, Output, Events & Actions, Record structures, Variables, Interface, Algorithm for Q8)*	5
0.2	Implementation of Interface	2
0.3	Option Statements	1
0.4	Effective use of methods	1
0.5	Commenting	1

Here are the requirements that they have specified:

1) The application must be able to store the following information for each Department being reviewed:

Field	Datatype	Example Data
a) Department Name	`String`	`"ACSSE"`
b) Number of Students	`Integer`	`759`
c) Information for each Module monitored:		
i) Module Code	`String`	`"IFM01A1"`
ii) Size of Files Uploaded Each Week (in MB)	`Double`	`156.3; 25.6; 0; ...; 250`
iii) Total Upload Size	`Double`	See Question 4
c) Module Average	`Double`	See Question 5
d) Departmental Rating	`Integer`	See Question 7

1.1	Definition of Module record structure	4
1.2	Definition of Department record structure	6

2) The solution must be able to handle any number of Departments, any number of Modules per Department, and any number of Weeks assessed for that Module. These numbers are to be specified by the user. For the purpose of this assessment, you may assume that each Department has the same number of Modules while each Module has been assessed for the same number of Weeks.

2.1	Input of number of Departments, Modules, and Weeks	2
2.2	Set up of dynamic arrays	5
2.3	Set up of the UJGrid control	2
2.4	Labelling of UJGrid headings *(Departments as Rows, and Modules as Columns)*	3

3) The user must be able to input the necessary data into the program.

3.1	Input of data for each Department *(including information for each Module offered by that Department)*	7

4) For each Module offered by each Department, calculate, store *(in field c-iii)*, and display the total file upload size. This is done by summing up the uploads over all the weeks for that Module in that Department.

4.1	Calculation of total file upload sizes.	5
4.2	Display of total number of total file upload sizes	3
4.3	Correct	8

5) For each Department, calculate and store *(in field c)* its Module Average. This is calculated by considering the total upload sizes of all modules in that Department.

5.1	Calculation of module averages	5
5.2	Display of module averages	1
5.3	Correct	6

6) Define a function called `ConvertG` which accepts one `Double` parameter called `size`. The function must return `size / 1000`.

6.1	Definition of `ConvertG` function	2
6.2	Code	1

7) For each Department, calculate, store *(in field d)*, and display its Rating. This is calculated by looking at the Department's Module Average in GB. Remember that 1GB = 1000MB.

Module Average in GB	Rating
0 to .75GB	1
.75 to less than 2.5GB	2
2.5GB or higher	3

7.1	Calculation of Ratings *(using the* `ConvertG` *function)*	6
7.2	Display of Ratings	1
7.3	Correct	7

8) Determine and store the index of the Department that had the highest Module Average. Use this index to display this Department's name as well as its Module Rating in a textbox.

8.1	Calculation of Department with highest Module Average	6
8.2	Display of Department name and Module Rating	2
8.3	Correct	8

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