



FACULTY OF SCIENCE

ACADEMY OF COMPUTER SCIENCE & SOFTWARE ENGINEERING

MODULE	IFM100 INTRODUCTION TO ALGORITHM DEVELOPMENT (VB)
CAMPUS	APK
EXAM	June 2016 – Paper B

DATE	2016-06-14	SESSION	12:30 -15:30
ASSESSORS		MR M CILLERS MR D COTTERRELL	
INTERNAL MODERATOR		MR SMA MAVEE	
DURATION	3 HOURS	MARKS	100

- This question paper consists of 3 pages.
- Please read through the following instructions and be sure to follow them precisely in order to prevent any problems as failure to submit properly can result in students failing the examination.
- **Please do not hesitate to ask an invigilator for help if you do not understand these instructions.**

INSTRUCTIONS:

- Please ensure that you are seated at the computer that has been assigned to you.
- Please name your Visual Basic solution using the following format CXXX_YYYYYYYYY where X represents your computer number and Y represents your student number. For example, student 201500001 sitting at computer number 10 will name his project C010_201500001.
- The project (and all associated files and subdirectories that form part of the project) **MUST** be saved to the T:\ drive in a single directory **bearing the name of your Visual Basic solution** (see point above).
- The first fifteen minutes of the examination are reserved for design only. Students may not begin coding until given notification to do so.
- The mark sheet on page 3 forms part of the question.
- The solution must be implemented in Visual Basic 2015.
- When you are ready to submit, all material provided to you must be handed in to an invigilator. Please note the following, you must:
 - Complete your details on page 3 of the question paper.
 - Save all files associated to your solution and close Visual Studio 2015.
 - Compress your project folder (which contains all necessary files associated to your project) in a zip file.
 - Upload the zip file to Eve.

Outer Services is an Internet service provider that needs help in monitoring the amount of data each of their clients are using over a set number of days.

For example: *Client X has a contract where they can use 1000 MB over the span of a number of days they use 770 MB. Therefore, they then have 230MB left.*

Outer Services is mainly concerned with the amount of data that is not used by each of their clients, as well as the number of clients that use more than the amount that is allocated to them and finally the name of the client that has used the least amount of data over the set number of days. You may assume that each client will be monitored for the same number of days.

The following information will be needed for each of the clients:

1. The name of the client (i.e. "John Smith")
2. The amount of data that is allocated to the client (i.e. 2000 MB)
3. The amount of data used each day by the client (i.e. 60 ; 100; 200; 500)
4. The amount of data left (**see question b**)
5. The type of the client (**see question d**)

Your application must be able to complete the following additional instructions:

- a) Read in all the needed information and display the amount of data each client used for each of the days.
- b) Calculate, store (**in 4**) and display the amount of data the client has left after the set number of days. This is calculated by taking the total amount of data used and subtracting that from the amount allocated to the client.
- c) Create a function called **DetermineType** that will accept one parameter as a integer and return a string, see the table below:

Values as Integer	String to be returned
< 100	"Heavy downloader"
100 to 450	"Average user"
> 450	"Low user"

- d) Use the function created in **question c**, to determine, store (**in 5**) and display the type of each client, based on the amount of data left.
- e) Calculate, store and display the average amount of data utilized each day by all the clients.
- f) Calculate and display the number of clients that have used more than their allocated amount, these are the clients that have an amount of data left that is less than zero.
- g) Calculate and display in a textbox the day that had the lowest average amount of data used.

Please note that no further marks will be awarded for Correct Execution from the point a program terminates unexpectedly – a solution that cannot be run will therefore be awarded 0 Correct Execution marks immediately whereas a program that is able to execute up to Question b) may qualify (subject to correctness of code) for Correct Execution marks up to Question b).

Academy of Computer Science & Software Engineering
Informatics 100: Introduction to Algorithm Development (VB)
June 2016 Examination –Paper B

Sort Rank



Student #										PC #				
ID														
Surname										Initis				

When you submit your solution, read through each of the following points and **tick each box** to confirm that you have completed the three steps below:

1. The full and final version of the Visual Basic project that I intend to submit for marking was saved to the correct location as specified by the invigilators. I fully understand that failure to save all project files to the correct location will mean that the Academy will not be able to mark my project and I will forfeit marks as a result.	
2. A zip file containing the full and final version of the Visual Basic project listed in Point 1 above has been uploaded to Eve.	
3. I have personally confirmed that the version of the Visual Basic project that has been saved to the backup media checked below is a correct copy of the Visual Basic project listed in Point 1 above.	
Signature	Backup Media
	CD USB

Section A: Design & Programming Practices

	M1	M2	Total		M1	M2	Total
Full Design			5	Variables & Record Structures			5
Form Look & Feel			2	Commenting			1
Option Statements			1	Effective Use of Subroutines			1
Section A Total							15
Execution Status:	Does not execute		Expected termination		Terminates during Question (indicate a-g)		

Section B: Execution of Program

				Code			Correct Execution		
	M1	M2	Total	M1	M2	Total			
Question a) Read in information and display the amount of data used by each client each day.									14
Input the number of clients and number of days (includes resizing the array and grid, plus labelling the grid)			8						
Input the details for each of the clients and display the amount of data used			7						
Question b) Calculate, store and display the amount of data each client has left.									5
Calculate and store the amount of data each client has left			4						
Display in the grid			1						
Question c) Create a function called DetermineType									4
Parameters, return value			4						
Question d) Determine, store and display the type of each client based on the amount of data left									4
Use the function to determine the type of each client is and store the type			3						
Display in the grid			1						
Question e) Calculate and display the average amount of data used each day									5
Calculate the average amount of data used each day			4						
Display in the grid			1						
Question f) Calculate and display the number of clients that have used over their allocated amount									5
Calculate the number of clients that have less than zero data left			4						
Display in a textbox			1						
Question g) Calculate and display the day that had the lowest average amount of data used									5
Determine which day has the lowest average amount of data used			4						
Display in a textbox			1						
Section B Totals						43			42
Examiner:	Signature	Initials	A	B (Code)		B (Correct)		Total	
			15	43		42		100	