



## FACULTY OF SCIENCE

### ACADEMY OF COMPUTER SCIENCE & SOFTWARE ENGINEERING

<b>MODULE</b>	<b>IFM100</b> INTRODUCTION TO ALGORITHM DEVELOPMENT (VB)
<b>CAMPUS</b>	<b>APK</b>
<b>EXAM</b>	<b>July 2019 – Supplementary Exam</b>

<b>DATE</b>	2019-06-16	<b>SESSION</b>	15:00 -18:00
<b>ASSESSORS</b>		MR D COTTERRELL MR T MOODLEY	
<b>INTERNAL MODERATOR</b>		MR K LEBEA	
<b>DURATION</b>	3 HOURS	<b>MARKS</b>	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 201900001 sitting at computer number 10 will name his project C010\_201900001.
- 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 2017.
- When you are ready to submit, all materials 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 2017.
  - Compress your project folder (which contains all necessary files associated to your project) in a zip file.
  - Upload the zip file to Eve.

You have been approached by the small crime division of the “Hermit World” police force. They need a system that can help them in tracking the number of small crimes in the different areas. The number of areas they monitor change every year. Therefore, the system needs to handle any number of areas. You may assume that all the areas will be monitored for the same number of weeks. The one area that they are concerned with is the number of the areas that fall into the “Yellow”, “Orange” and “Red” areas.

The following information will be required for each of the areas:

1. Area Name (i.e. “Ender World”)
2. Name of the officer in charge of area. (i.e. “Iskall”)
3. The number of small crimes each week. (i.e. 6.25;7.26;8.25;...)
4. The total number of crimes reported for the area. (see question b)
5. The average number of crimes reported for the area. (see question c)
6. Area colour. (see question e)

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

- a) Read in all the needed information and display all the details regarding each of the area as instructed.
- b) Determine, store (in 4) and display the total number of crimes per area.
- c) Determine, store (in 5) and display the average number of crimes per area.
- d) Create a function **DetermineZone** that accepts a parameter of type double and returns a string based on the following conditions, make use of a select case:

Value of type double accepted	Value of type string returned
0 to 25	“White”
26 to 50	“Yellow”
51 to 75	“Orange”
Greater than 75	“Red”

- e) Using the function created in **question d**, determine, store (in 6) and display the areas Zone colour. The zone colour is based on the average number of crimes in the area.
- f) Determine and display which area that has the highest number of crimes for all the areas.
- g) Determine and display in a textbox the percentage of areas that fall into the “Yellow”, “Orange” and “Red” zone.
- h) Lastly, determine and display the number of crimes that are reported each week.

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 2019 Examination –Paper C (SSA)

Sort Rank



Student #											PC #			
ID #														

**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. <b>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.</b>	
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 <b>personally confirmed</b> that the version of the Visual Basic project that has been saved to the backup media checked below is a <b>correct copy</b> of the Visual Basic project listed in Point 1 above.	
Signature	Backup Media
	CD
	USB

**Section A: Design & Programming Practices**

	Mark	Total		Mark	Total
Full Design		5	Variables & Record Structures		5
Form Look & Feel		2	Commenting		1
Option Statements		1	Effective Use of Subroutines		2
<b>Section A Total</b>					<b>16</b>

<b>Execution Status:</b>	Does not execute	Expected termination	Terminates during Question (indicate a-g)
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**Section B: Execution of Program**

Section B: Execution of Program			Code		Correct Execution	
			Mark	Total	Mark	Total
<b>Question a) Read in the information and display all the details for each area</b>						14
Input the number of area and weeks that are being monitored (this includes resizing the array and grid plus labelling the grid)				7		
Input the details for each area and display all the details to the grid				7		
<b>Question b) Calculate, store and display the total number crimes reported per area</b>						4
Calculate and display the total number crimes reported each area				3		
Display in the grid				1		
<b>Question c) Calculate, store and display the average number crimes reported per area</b>						3
Calculate and store the average number of crimes reported for each area				2		
Display in the grid				1		
<b>Question d) Create a function called DetermineZone</b>						
Parameters, and return value				4		
<b>Question e) Calculate, store and display the area zone using the function</b>						
Calculate and store the area zone based on the average number of crimes reported using the function				2		
Display in the grid				1		
<b>Question f) Determine and display the area with the highest number of crimes reported</b>						
Determine the area with the highest number of crimes reported				4		
Display in a textbox				1		
<b>Question g) Determine and display the percentage of area what are in the “Yellow”, “Orange” and “Red”</b>						
Determine the percentage of areas in the “Yellow”, “Orange” and “Red”				4		
Display in a textbox				1		
<b>Question h) Determine and display the total number of crimes reported each week</b>						
Determine the total number of crimes reported each week.				4		
Display in a grid				1		
<b>Section B Totals</b>				43		
Examiner:	Signature	Initials	A	B (Code)	B (Correct)	Total
			16	43	41	100