



## 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>June 2019 – Paper A</b>

<b>DATE</b>	2019-05-22	<b>SESSION</b>	12:30 -15:30
<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 “*IFMCraft*” a game company that will be hosting a competition where teams will need to build a base in the game environment. Once the time is up, each team will be judged by a panel of judges to determine which Team won the competition. The main object of the application is to read in the necessary information and then determine which team won the competition, which is dependent on the highest average score given by the judges.

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

1. Name of the Team (i.e. “**Shara**”)
2. Name of the team leader (i.e. “**Mombo Jombo**”)
3. The points received by each of the judges for the building. (i.e. 5; 6; 7; ...)
4. The total points awarded to the team. (see question b)
5. The average points awarded to the team. (see question c)
6. A Comment on the building. (see question f)

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

- a) Read in all required information and display all the details regarding each team as instructed.
- b) Calculate and store (in 4) the total points that were awarded to the team by the judges.
- c) Calculate, store (in 5) and display the average points awarded to the team by the judges.
- d) Determine, store and display the average points given by each judge for the teams.
- e) Create a function called **DetermineComment** this is a function that will accepts a single double and returns a String. Make use of a nested if-statement to return the correct values based on the following conditions:

Value given as a double	Value to be return as a String
0 to 4 (including 0 and 4)	“Below Standard”
4 to 7	“Average ”
Greater than and equal to 7	“Above Standard”

- f) Using the function created in **question e**, determine, store (in 6) and display the comment per base built on the average score achieved by each team.
- g) Now for the most important section, determine which of the bases built that where judged, received the highest average score and display the team leaders name in a textbox.
- h) Determine and display in a textbox the number of teams that have the comment of “Average” based on their average points scored.

**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 A

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	<table border="1"> <tr> <td>Backup Media</td> <td>CD</td> </tr> <tr> <td></td> <td>USB</td> </tr> </table>	Backup Media	CD		USB
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 of the team</b>						14
Input the number of teams and judges that are being monitored (this includes resizing the array and grid plus labelling the grid)				7		
Input the details for each team and display all the details to the grid				7		
<b>Question b) Calculate, store and display the total points awarded to the build</b>						4
Calculate, store and display the total points awarded to each team by the judges				3		
Display in the grid				1		
<b>Question c) Calculate, store and display the average points awarded to the team</b>						3
Calculate and store the average points awarded to the team by the judges				2		
Display in the grid				1		
<b>Question d) Determine, store and display the average points given by the judges</b>						5
Calculate and store the average points given by each judge				4		
Display in the grid				1		
<b>Question e) Create a function called DetermineComment</b>						
Parameters, and return value				4		
<b>Question f) Calculate, store and display the comment of the base considering the average points</b>						5
Calculate and store the comment for the team using the function based on the average				2		
Display in the grid				1		
<b>Question g) Determine and display the name of the team leader of the project that has highest average points</b>						5
Calculate and display in a textbox the name of the team leader where the team has highest score				4		
Display in textbox				1		
<b>Question h) Determine and display the number of teams that have the comment of "Average"</b>						5
Calculate the number of projects that have the comment of "Average"				4		
Display in textbox				1		
<b>Section B Totals</b>				<b>43</b>		<b>41</b>
<b>Examiner:</b>	<b>Signature</b>	<b>Initials</b>	<b>A</b>	<b>B (Code)</b>	<b>B (Correct)</b>	<b>Total</b>
			16	43	41	100



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You have been tasked by “Formula 4” a racing company, they need help in monitoring the team and the drivers lap time. They are most interested in which driver is the fastest. They will need your application to collect certain details from each driving team. They do not know the number of teams that will be competing yet, also the number of laps has not been determined as of yet. But they did inform you that all the teams will compete in the same number of laps.

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

1. Name of the driving Team (i.e. “Speeding Jack”)
2. Name of the driver (i.e. “Iskall”)
3. The time it took to compete each lap (i.e. 6.25;7.26;8.25;...)
4. The total time it took to complete all the laps. (see question b)
5. The average time it took to complete all the laps. (see question c)
6. A comment for each driver. (see question e)

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

- a) Read in all required information and display all the details regarding each of the driving teams as instructed.
- b) Calculate, store (in 4) and display the total time taken to complete all the laps for each team.
- c) Calculate, store (in 5) and display the average time taken to complete all the laps.
- d) Create a function called **TeamClassification** that will accept one parameter of type double and return a string based on the following conditions, make use of a select case:

Double value accepted a parameter	String value to be returned
0 to 20	“A”
21 to 50	“B”
51 to 75	“C”
76 to 100	“D”

- e) Using the function created in **question d**, determine, store (in 6) and display the classification of each team. The classification of the team is based on the average time to complete all the laps.
- f) Determine, store and display the average time for each of the laps.
- g) Calculate and display the which lap had the quickest time, this is the average time for each lap not the driver.
- h) Determine and display in a textbox the percentage of teams that have a classification of “C” and “D”.

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**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>

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**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 of the teams</b>						14
Input the number of team and laps that are being monitored (this includes resizing the array and grid plus labelling the grid)		7				
Input the details for each team and display all the details to the grid		7				
<b>Question b) Calculate, store and display the total time to complete all the laps per team</b>						4
Calculate and store the total time for the team to complete all the laps		3				
Display in the grid		1				
<b>Question c) Calculate, store and display the average time for the driver to complete the laps</b>						3
Calculate and store the average time to complete all the laps		2				
Display in the grid		1				
<b>Question d) Create a function called TeamClassification</b>						
Parameters, and return value		4				
<b>Question e) Calculate, store and display the team classification using the function</b>						5
Calculate and store the team classification of the team using the function		2				
Display in the grid		1				
<b>Question f) Determine, store and display the average time per lap</b>						5
Calculate and store the average time for each of the laps		4				
Display in the grid		1				
<b>Question g) Calculate and display which lap had the fastest average time</b>						5
Determine the lap with the fastest average time		4				
Display in a grid		1				
<b>Question h) Calculate and display the number of team with classification of "C" or "D"</b>						5
Calculate the percentage of teams that have a classification of "C" or "D"		4				
Display in textbox		1				
<b>Section B Totals</b>		<b>43</b>				<b>41</b>
<b>Examiner:</b>	Signature	Initials	A	B (Code)	B (Correct)	Total
			16	43	41	100