FACULTY OF SCIENCE

ACADEMY OF COMPUTER SCIENCE & SOFTWARE ENGINEERING

MODULE	**IFM100**	
	INTRODUCTION TO ALGORITHM DEVELOPMENT (VB)	
CAMPUS	**APK**	
EXAM	**July 2016 (SSA)**	

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.**

<u>INSTRUCTIONS:</u>

- 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.

In light of the problems arising with the registration of students into high schools, you have been approached to develop a Visual Basic application to assist in this matter. Your application needed to monitor the number of students that have registered at each school on each day and then determine the number of spaces left at each school. For the purpose of the application each school must have at least 1000 spaces open, they may have more but no less. After all the information has been entered you must also determine which of the schools is the most popular.

The following information will be needed for each of the schools:
1. The name of the school (**i.e.** "Al's High School")
2. The maximum number of students that can register at the school (**i.e.** 1200)
3. The number of students that have register each day at the school (**i.e.** 50;60;100; 120)
4. The amount of space left **(see question b)**
5. The status of the school in terms of the space left **(see question d)**
6. The average amount of registration at the school **(see question e)**

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

a) Read in all the needed information and display the number of students that have registered each day at each school.

b) Calculate, store **(in 4)** and display the amount of space left for students to register at each school. This is calculated by adding up the number of students that have registered on each day and subtracting that from the maximum number of students that could register.

c) Create a function called **DetermineStatus** that will accept one parameter as an Integer and will return a string, see the table below:

Value as Integer	String to be returned
< 0	"Over crowded"
0 to 30	"Almost closed"
31 to 100	"Still space"
> 100	"Plenty of space"

d) Using the function created in **question c**, determine, store **(in 5)** and display the status of the schools, based on the amount of space left.

e) Calculate, store **(in 6)** and display the average amount of students that have registered on each day at the schools.

f) Calculate and display the number of schools that have more than 100 spaces left for students to register.

g) Calculate and display the name of the most popular school. This is the school that has the lowest amount of the space left to register.

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) <u>may</u> 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)
July 2016 Examination – SSA

Sort Rank

UNIVERSITY OF JOHANNESBURG

Student #										PC #			
ID													
Surname										**Inits**			

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 necessary details per school							14
Input the number of schools and the number of days (includes resizing the array and grid, plus labelling the grid)				8			
Input the details for each school and display the number of students that have registered each day				7			
Question b) Calculate, store and display the space left for students to register at each school							5
Calculate and store the space left at each school for students to register				4			
Display in the grid				1			
Question c) Create a function called DetermineStatus							4
Parameters, return value				4			
Question d) Using the function to determine, store and display the status of each school							4
Determine and store the status of the school using the function based on the space left				3			
Display on the grid				1			
Question e) Calculate, store and display the average number of students registered at each school							5
Calculate and store the average number of students registered at each school				4			
Display the grid				1			
Question f) Calculate and display the number of school that have higher than 100 spaces left							5
Calculate the number of schools that have more than 100 spaces left				4			
Display in a textbox				1			
Question g) Calculate and display the name of the most popular school							5
Calculate the name of the school with the least amount of spaces left				4			
Display in a textbox				1			
Section B Totals				43			42

	Signature	Initials	A	B (Code)	B (Correct)	Total
Examiner:						
			15	**43**	**42**	**100**