FACULTY OF SCIENCE

ACADEMY OF COMPUTER SCIENCE AND SOFTWARE ENGINEERING

MODULE	**IFM01A1 & IFM1A10** INFORMATICS 1A: INTRODUCTION TO ALGORITHM DEVELOPMENT (VB)
CAMPUS	APK
SEMESTER TEST	MAY 2018 – PAPER A

DATE	2018-05-11	**TIME**	14:00 – 17:00
ASSESSORS		K LEBEA WS LEUNG	
INTERNAL MODERATOR		D COTTERRELL	
DURATION	3 Hours	**MARKS**	100

PLEASE READ THROUGH THESE INSTRUCTIONS CAREFULLY AND ADHERE TO THEM
The Academy takes NO responsibility for your ignorance (willful or otherwise) and will NOT grant additional opportunities to students who fail to submit their work correctly

- This question paper comprises 4 (four) pages (including this cover page)
- The use of calculators are NOT permitted during this assessment
- The first 20 (twenty) minutes are reserved for DESIGN (must be done on answer sheet provided)
- Answer ALL questions
- No further marks will be awarded for Correct Execution from the point your submitted program terminates unexpectedly

- Project naming convention: AXXX_YYYYYYYYY where X represents your computer number and Y represents your student number (e.g. student 201800001 sitting at computer number 10 will name their project A010_201800001)

- SAVE REGULARLY – no additional time will be granted due to power failures
- Save ONLY to the T:\ directory
- Do NOT save to other locations outside of the default project folder – use ONLY the Save All button

- When you are ready to submit: read through page 4 for submission guidelines and complete your details
- An invigilator must be alerted to verify and take in your submission

DO NOT TURN OVER THIS QUESTION PAPER UNTIL
YOU HAVE BEEN GIVEN INSTRUCTION TO COMMENCE

Welcome to the Botswana Tourism Authority offices. As you may or may not know, 13% our country's GDP (that's the country's income) comes from tourism. It is therefore very important that we keep up the good work here in our offices to promote Botswana as a top destination for tourists.

One way in which we can determine how popular a particular tourist destination is, is to track the number of photographs that tourists take of that attraction and post it on social media. However, this can get rather time consuming and staff would rather spend their time focusing on writing up witty slogans to attract more visitors to the country. This is where you come in. We want you to design and develop a Visual Basic application that will help our team keep track of these photographs.

Are you up for the job? Rumour is, if you do a fantastic job, there's a direct promotion on the horizon for you to Division 1B (we hear that staff in that division get to do some really classy projects) in the works if you make our Minister happy. Well, enough talk from my side. Let's get you those instructions from our Minister.

Botswana Tourism Authority (BTA) Offices Internal Memo

From: The Minister

To: Application Development Staff (Division 1A)

Initial Requirements:

- 1 x complete design
- 1 x desktop application (Visual Basic!) that runs
  - Your Student Number, Computer Number, and Surname, Initials must appear as a comment at the top of your form's code
  - Professional-looking interface
  - Code must be easy to maintain
  - Name the project properly!!!
  - Questions 2–9 should be answered under their own method
  - Any decimal values that must be displayed must display up to exactly 1 decimal place

0.1	Design (Input, Output, Events & Actions, Variables, Record structures, Interface, Test Data, Algorithms)	5
0.2	Implementation of Interface	2
0.3	Option Statements	1
0.4	Effective use of subroutines / functions	1
0.5	Commenting	1

1) The following data must be stored by each Destination recorded:

Field	Example Data
a) Destination Name	"Chobe National Park"
b) For each Activity available at the Tourist Destination:	
i) Activity Name	"Boat Safari"
ii) Number of Visitors	1235
iii) Number of Photos of Activity at Destination on each Social Media Site	2; 39; 32; ...; 123
iv) Total Photos	See Question 4
v) Photos-Visitors Ratio	See Question 6
c) Index of Activity with Highest Photos-Visitors Ratio	See Question 7
d) Tourism Rating	See Question 8

1.1	Definition of Activity record structure	5
1.2	Definition of Destination record structure	4

2) The application must be able to handle any number of Destinations, any number of Activities per Destinations, and any number of Social Media Sites reviewed for each Activity. These numbers are specified by the user. You may assume that each Destination has the same number of Activities while each Activity is reviewed for the same number of Social Media Sites.

2.1	Input of number of Destinations, Activities, and Social Media Sites	2
2.2	Set up of dynamic arrays	5
2.3	Set up of UJGrid control	2
2.4	Labelling of UJGrid control headings (Destinations as Rows, and Activities as Columns)	3

3) The application must allow the user to input the relevant Destination (and their related Activities) data storing this in a single array of a custom data type.

3.1	Input of data for each Destination (including data on each Activity)	5

4) For each Activity offered at each Destination, calculate and store (in field b-iv) the total photographs that have been uploaded to each social media site.

4.1	Calculation of Total Photographs per Activity per Destination	3

5) Write a subroutine called `CalcRatio` that, given two arguments (two `Integers`), "returns" a `Double` value that represents the result of dividing the first `Integer` argument with the second one.

5.1	Definition of `CalcRatio` Subroutine	3

6) For each Activity offered at each Destination, use the `CalcRatio` subroutine to calculate, store (in field b-v), and display the Photos-Visitors ratio. This is calculated by dividing the total photographs by the number of Visitors.

6.1	Calculation of Photos-Visitors ratio per Activity per Destination using `CalcRatio` subroutine	3
6.2	Display of Photos-Visitors ratio	3
6.3	Correct (correctness based on Questions 4–6)	12

7) For each Destination, calculate, store (in field c), and display the index of the Activity that has the Highest Photos-Visitors Ratio.

7.1	Calculate Index of Activity with highest Photos-Visitors Ratio per Destination	6
7.2	Display Index of Activity with highest Photos-Visitors Ratio per Destination	1
7.3	Correct	7

8) For each Destination, calculate, store (in field d), and display the Destination's Tourism Rating. This is determined as follows (a `Select Case` statement must be used):

When Index of Activity with Highest Photos-Visitors Ratio Is...	Destination Rating Is...
Even	"A"
Odd	"B"

8.1	Calculate Tourism Rating for each Destination	4
8.2	Display of Destination's Tourism Rating	1
8.3	Correct	5

9) Assess the Index of the Highest Photos-Visitors Ratio of each Destination. Are the values increasing or remaining the same? Display this result in a textbox.

9.1	Determine existence of trend in Index of the Highest Photos-Visitors Ratios	7
9.2	Display of trend status	1
9.3	Correct	8

Ready to Submit? Follow the Instructions Below

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a) On your exam booklet, CLEARLY indicate your details, INCLUDING your Computer Number

Preparing the Zip file and Uploading to Eve

b) Zip up the folder containing your project - ensure that this zip contains your entire project
c) Visit http://eve.uj.ac.za
d) Select File Storage from the Menu
e) Select the link Informatics 1A Semester Test 2
f) Enter your username (your student number)
g) Enter the password (found on the back of your number card placed at your computer
h) Upload the Zip file you created in Step b
i) Download the file to another location and unzip it to verify that the entire project is there (make sure that your project does not show any external links in the Solution Explorer)

Preparing the Backup to CD (use the CD provided to you)

j) Burn EVERYTHING on the T:\ drive to the CD
k) Use your Student Number for the Disc title and Select With a CD/DVD player
l) If your CD fails, alert an assistant to backup your project to USB instead

Agreement and Submission

m) Complete your details - by signing below, you acknowledge that you have done the above steps to ensure that your submission is correct.
   - I have followed the naming convention as instructed on page 1
   - A zip of the full and final project has been uploaded to Eve
   - A backup zip of the full and final project has been made

   I further acknowledge that:
   - I know that a non-compiling submission is capped at 40%
   - Code I comment out will not be marked
   - The appearance of UJGrid error messages are treated as if the program has crashed
   - I take full responsibility for ensuring that my submission is correct and the version I intend to submit for assessment

Student #										PC #			
ID/Passport #													
Signature													
Backup Used	CD							USB					

n) Hand everything in to the invigilators (this question paper, the assessment script, CD, number card).