VANCOUVER ISLAND UNIVERSITY
CSCI 112 — FINAL EXAMINATION
06 December 2013, 13:00 — 16:00

TO BE ANSWERED IN BOOKLETS DURATION: 180 Minutes

              INSTRUCTOR: H. Liu

Instructions

- Students must count the number of pages in this examination paper before beginning to write, and report any discrepancy immediately to the invigilator.

- This examination paper consists of 4 pages.

- This is a CLOSED BOOK examination. You are allowed to bring one piece of letter-sized double-sided note.

- Calculators are NOT permitted.

- Remember to state any assumptions and show rough work.

- Note carefully the weight of each question, and answer appropriately.

- Attempt all questions. All questions relate to material covered in the lectures, labs and assignments.

1. (20 Marks) Answer the following questions regarding the programming language VBA succinctly.

   (a) What is the difference between a Do-While-Loop statement and a Do-Loop-While statement?

   (b) Why is consistent indentation important in a VBA program?

   (c) What can you do to make sure that the index of the last element in an array is the same as the length (or size) of that array?

   (d) You can use a variable without declaring it in VBA. But it is generally considered to be a bad idea. Why? How can you make sure that the computer will help to enforce you to declare a variable before use it?

   (e) What's the difference between unloading a user form and hiding a user form? Describe a task (or a segment of statements) that can be performed after a user form is hidden but can't after the user form is unloaded.

2. (10 Marks) The following table shows the raw data stored in an Excel worksheet.

	A	B	C	D	E	F
1	Unit Price	15.25				
2	Year	Monthly Sale Units				
3		May	June	July	August	
4	2010	15	44	25	31	
5	2011	32	28	29	30	
6	2012	52	37	22	27	
7						

   (a) In the cell F6, enter a formula that displays the average of the data stored in range B4 to E6. (Note: the Excel built-in function to calculate average is AVERAGE, and it takes a range as its parameter.)

   (b) In the cell B7, enter a formula to calculate the sale amount (as unit price times units) of May 2012. Make sure that your formula can be copied and pasted into C7, D7 and E7 for June, July and August without the need to manually modify the formula.

3. (15 Marks) Develop a VBA function, called `calculateCharge`, that takes two parameters, an integer number, called *pType*, as the type of the plan a user subscribes to and a double number, called *usage*, as the data usage (in GBytes) the user used in a month and calculates and returns the monthly charge for the data usage using the unit price per GByte listed in the following table. (You can simply calculate the charge as the usage multiply the appropriate unit price.)

Plan Type	$<= 5$ GByte	5 GByte to 10 GByte	> 10 GByte
Economy (1)	7	6.5	5.0
Premium (2)	8	6	5.0
Ultimate (3)	9	6.5	4.5

Your function should return -1 if the plan type is not valid and/or the usage is not a positive number.

4. (15 Marks) Develop a VBA function, called `calculateAverage`, that takes the start row number, the end row number and a column number as its parameters, and then calculate the average of all the numbers stored in the active worksheet in the indicated column from the indicated start row to the indicated end row. You can safely assume that the data in these cells are floating point numbers. Your function should return a double number in the end.

5. (15 Marks) In an Excel workbook, the currently active worksheet is called "customers". In this active worksheet, Column A to D stores customer's ID (A), full name (B), address (C) and phone number (D) respectively. The actual customer data area starts from row 4 and there is no blank lines in the data area.
   Develop a VBA procedure, called `LookUpCustomerInfo` that performs the following steps:

   • Ask the user for a customer's ID. (You can assume the ID is a string.)

   • Search the data area to see whether there is a customer with the given ID. (The search should start from row 4, and you can use the function isEmpty(a cell) to test whether the data area has ended.)

   • If there is a customer with the given ID, then use a message box to display the customer's name, and phone number. Otherwise, use a message box to display an appropriate error message. (You can assume that the customer IDs are all unique.)

6. (25 Marks) A child's birthday party service would like you to design a user form to calculate the service charge for its customers. **The basic service charge is $200 for each birthday party event.** Then, for each event, the service provides other optional services. Their type and the corresponding charges are shown in the table below:

Service	Charge
Extra Fancy Birthday Cake	$30
Clowns	$50
Magicians	$40
Other Entertainers	$30
Costume Rental	$10 for each participant

The party service also tries to retain its customers by giving 15 percent discount to repeated customers.

The user form should allow the party service staff to

- enter the number of participants (including the birthday child) to a birthday party event,

- pick the optional services (maybe even all of them) required by the customer,

- choose whether the party is held by a first-time customer (no discount) or a repeat customer (with 15 percent discount).

And then, the staff can click a button displayed as `Calculate` to calculate and display the total charge for such an event. (Do not forget the basic service charge.)

(a) First, draw the user form, and indicate each control's type, name (may be used in the VBA code later) and caption.

(b) Then, program for the event `command button Calculate Click`. When this button is clicked, the total charge for the event should be displayed on the dialog box.
(Note: You may need the following information:

- The header of the subroutine for handling such an event would be: `Private Sub CalculateButton_Click()` .

- For a text box object, you can use the property Value or property Text to read the data entered into the text box.

- If a checkbox is selected, its property Value is set to be True, otherwise, it is set to be False.

- If a option button is selected, its property Value is set to be True, otherwise, it is set to be False. Only one option button can be selected among the group of option buttons within a frame.

- You can change a label's property Caption to change its display.

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