

CHIANG MAI UNIVERSITY

Bachelor of Science (Software Engineering)

College of Arts, Media and Technology 1st Semester / Academic Year 2019

955103 PROGRAMMING LOGICAL THINKING

	Lab Assignment 08 : Program Tracing					
Name .	Student ID Section					
Objecti	ives:					
1)	The student can use the trace table to debug a source code.					
Prograi	m Tracing					
	In computer programming, the program tracing means to simulate the execution of the					
progran	m or source code on paper. In other word, it is an instruction-by-instruction walkthrough the					
source	code monitoring how the variable(s) change. The program tracing can be used to several					
purpos	e 1) to help a programmer to learn a language, and 2) to help a programming to debug a					
progran	m (find errors in the program).					
	The main idea of the program tracing is to follow the change of the value in each variable. The					
progran	m tracing can be applied to pseudo code, flowchart and source code.					
Exampl	le					
1. Giver	n the following pseudocode					
1) resu	ult = 1+2					
2) resu	ult =result*2					
3) resu	ult =6/result					
4) DISP	PLAY result					

The manual program tracing is always done in tabular style where each statement is matched with the value of the variable. The line number is used to refer to the statement. As a consequence, some line

number can be repeated to indicate the repetition structure or can be omitted to indicate the selection structure. The example of the tracing table is shown in the following table.

Line no.	Statement	result
Initialization		
1.	result =1+2	
2.	result = result*2	
3.	result =6/result	
4.	DISPLAY result	

At the beginning, all the variable is initialized to the empty value at the beginning statement (line 0).

Line no.	Statement	result
Initialization		0
1.	result =1+2	
2.	result = result*2	
3.	result =6/result	
4.	DISPLAY result	

After each line is executed, the value is updated in the corresponding variable.

Line no.	Statement	result
Initialization		0
1.	result =1+2	3
2.	result = result*2	
3.	result =6/result	
4.	DISPLAY result	

This process is repeated until the program terminates.

Line no.	Statement	result
Initialization		0
1.	result =1+2	3
2.	result = result*2	6
3.	result =6/result	1
4.	DISPLAY result	1

Problem set

1.	Given	the	follo	wing	pseud	locode
----	-------	-----	-------	------	-------	--------

1) GET num1, num2
2.) temp = num1
3.) num1 = num2
4.) num2 = temp
5.) DISPLAY num1, num2

Complete the following table

Line no.	num1	num2	temp
Initialization			

2. Given the following pseudocode

1.) GET num1, num2		
2.) counter=0		
3.) result=1		
4.) WHILE counter <num2< td=""></num2<>		
4.1.) result=result*num1		
4.2.) counter=counter+1		
5.) ENDWHILE		
6.) DISPLAY result		

If the user input 2 for num1 and 3 for num2, complete the following table.

Line no.	num1	num2	counter	result
Initialization				

^	0:	41	£ _ 11		
J.	Given	ıne	following	pseudo	code.

1.) num = 2

2.) WHILE num != 1

2.1.) DISPLAY num

4.2.) num = num + 1

5.) ENDWHILE

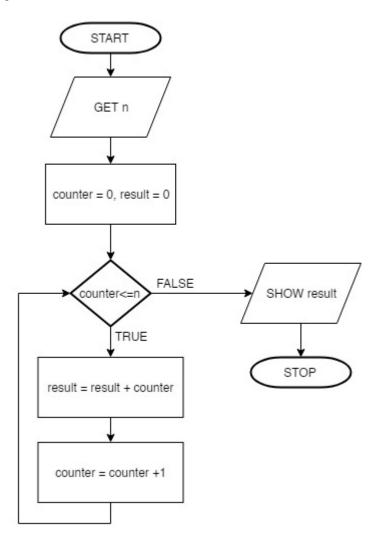
Complete the following trace table.

Line no.	num	Output
Initialization		

Line no.	num	Output

dentify the loop problem in the chart and explain how to solve it.

4. Given the following flowchart,



Remark: This program should run n times. You must indicate the line no. by yourself.

Complete the following trace table if the user input 4 for n.

Line no.	n	counter	result
Initialization			

Identify the lo	op problem in	the chart and ex	oplain how to so	olve it.	
				•••••	

5. Use the interface from earlier problem and given the following source code

```
initialize global num1 to 75
                                   initialize global counter to 100
initialize global temp to 2
                                   initialize global result to 999
initialize global (num2) to (33)
when Button1 .Click
do set global num1 v to TextBox1 v . Text v
     set global num2 v to TextBox2 v
     set global counter v to 0
     set global result to 1
     while test get global counter •
                                        get global num2 *
          set global result . to
                                       get global result 🔹
                                                               get global num1 *
          set global counter 🔻 to 👢
                                        get global counter *
     call Notifier1 .ShowMessageDialog
                               message
                                                     " Result =
                                                     get global result
                                          " Result
                                   title
                             buttonText
                                          " OK "
```

If the user input 4 for num1 and 4 for num2, complete the following table.

Line no.	num1	num2	counter	result	temp
(Initialization)					

Remark: Indicate the line no. by yourself.

5. Use the interface from earlier problem and given the following source code

```
initialize global (text) to
         initialize global score to 100
Line no.
          when Button1 .Click
      1
               set global score v to TextBox1 v . Text v
               🧔 if
      2
                              get global score ▼ ≥ ▼
                                                         50
                                                                            get global score 🔻
                                                                                                       100
      3
               then set global text to
                                              PASS
               else if
                                                         0
                                                                                                     50
      4
                              get global score ▼ ≥ ▼
                                                                           get global score *
               then
                     set global text v to
      5
                                             You have input the wrong score!!!!!
                     set global text v to
      6
               call Notifier1 .ShowMessageDialog
      7
                                                     get global text 🔻
                                          message
                                              title
                                                       Result "
                                        buttonText
```

For simplicity, you only have to write the line number. If you want to write the first line which is

```
set global score v to TextBox1 v . Text v
```

You only have to write "Line 1"

5.1 If the user input 50 for textbox1, complete the following table.

Statement	text	score
(Initialization)	(62)	100
Line 1		50

Remark: Notifier is a user interface to display the message to user.

5.2 If the user input 30 for textbox1, complete the following table.

Statement	text	score
(Initialization)	"	100
Line 1		50

5.3 If the user input -3 for textbox1, complete the following table.

Statement	text	score
(Initialization)		100
Line 1		50