CHIANG MAI UNIVERSITY
College of Arts, Media and Technology
1st Semester / Academic Year 2025
960101 Fundamental of Programming Logic in Digital Industry

Lab Assignment 05 : If-nested Statement

Name ………………กันต์ธีร์ วารีสอาด…………………… Student ID ………………………………Section……1……

Objectives:

1) Students understand the logic of nested selection programming.
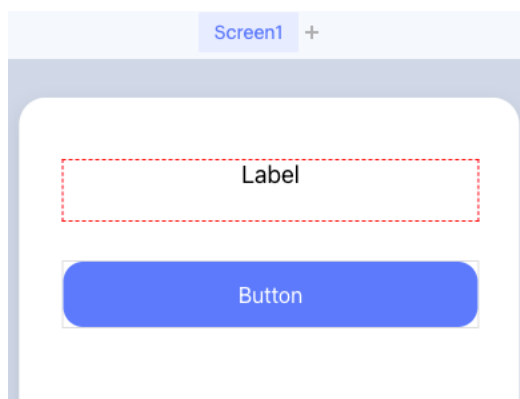2) Students can do the nested if-condition with and/or logic problem sets.

Get Start

1. Go to https://thunkable.com/ and login.
2. From "**My Project**" page, Click on "**Create New Project**" button. Once the window pop up, input new project name as "**Lab05**" and select category of project as "**Education**".
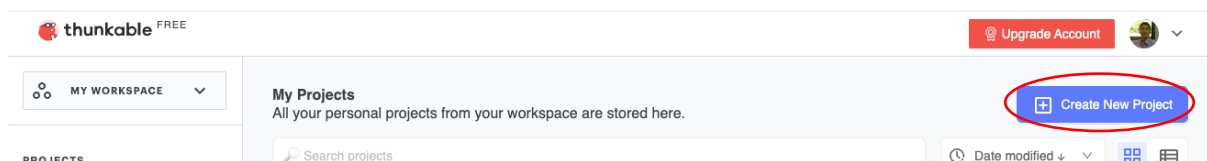
Example 1: Nested-If

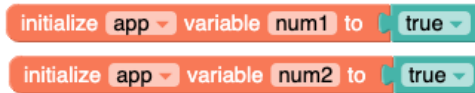1. In the "**Design**" view, create a label and a button on the app interface.

2. In the "**Blocks**" view,
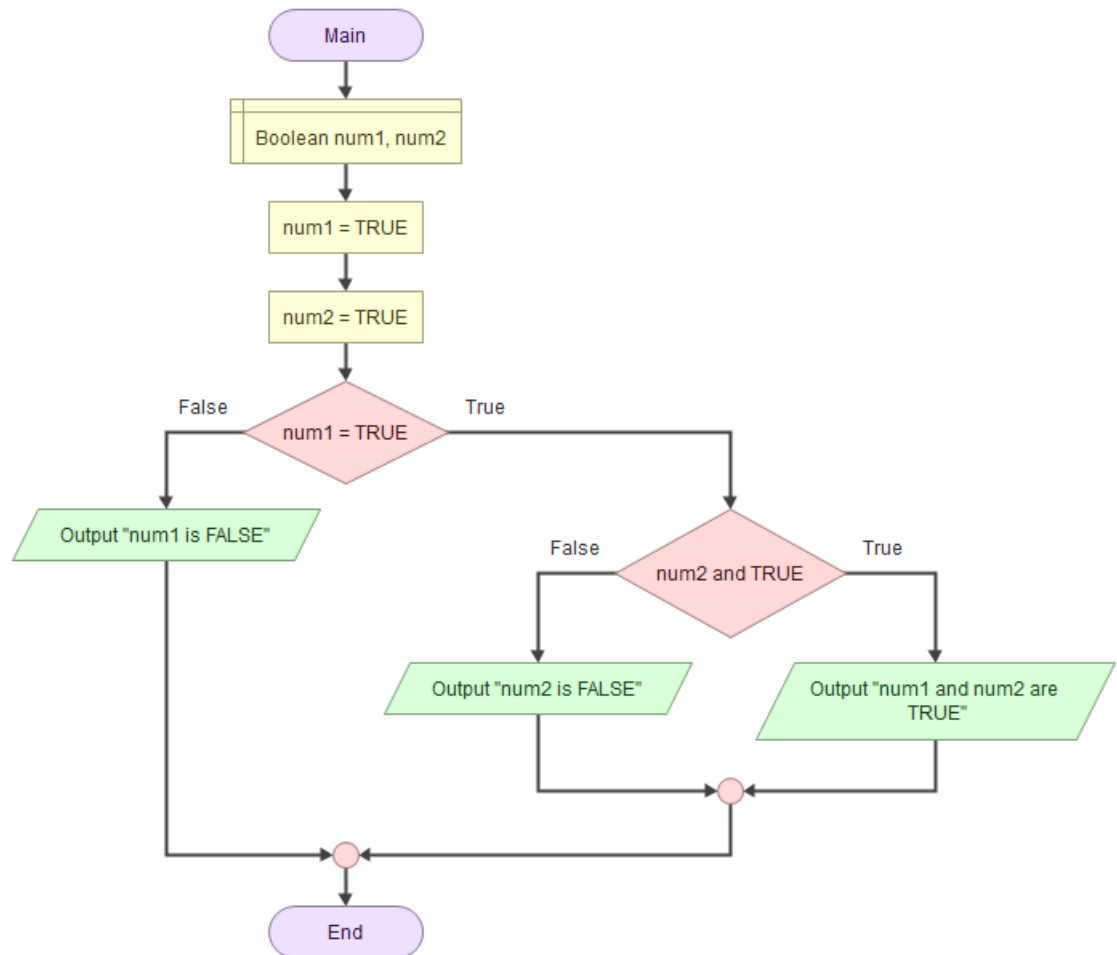   2.1 Click on **Variables** tab and drag two following blocks into the block design console.

   2.2 Change variable name to "**num1**" and "**num2**".
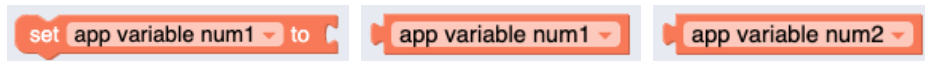
2.3 Click on **Logic** tab and drag logical "**true**" and "**false**" block into the block design console and connect those block as the following.
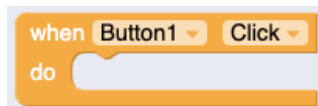

3. Create the program according to the given **Flowgorithm** flowchart.

3.1. Click on **Variables** tab and drag the following blocks into the block design console.

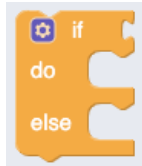3.2. Click on **Button1** UI component and drag the following block into the block design console.

3.3. Click on **Label1** UI component and drag three of following block into the block design console.
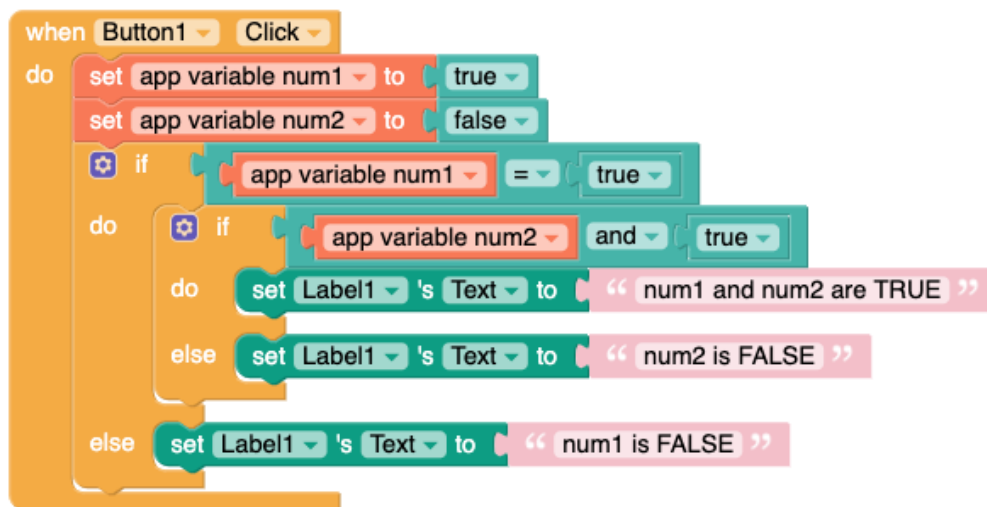
3.4. Click on Logic tab and drag two of following block into the block design console.

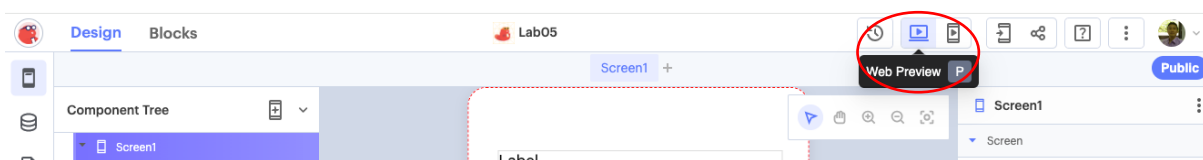3.5. Click on Control tab and drag two of following block into the block design console.

3.6. Form the blocks as follows. This set of blocks will perform an "and" operation on variable "num1" and "num2", and then assign the result to variable "num3".

4. Preview the result
   4.1. On the "Design" view, click "Web Preview" menu.
   4.2. And Then click on button to see the result.

5. From the program which implementing the logic of the if-nested statement above, complete the following table:

num1	num2	Text in Label1
TRUE	TRUE	num1 and num2 are TRUE
FALSE	TRUE	num1 is FALSE
TRUE	FALSE	num2 is FALSE

Hint: Chang value of "num1" and "num2" and run the program to test the answer.

Example 2: If with AND, OR, and NOT statement

From the given **Flowgorithm** flowchart implement the program in **Thunkable**.

1. In the "**Design**" view,
    1. 1   click on the "**Screen1**" component.
    1. 2   Then, click on the "**more options**" or "**ellipsis**" menu (⋮) located on the right panel. And then select to duplicate the screen.
    1. 3   Then, select "**Screen2**" component or "**Screen2**" tab.
    1. 4   And click on "**Blocks**" view.
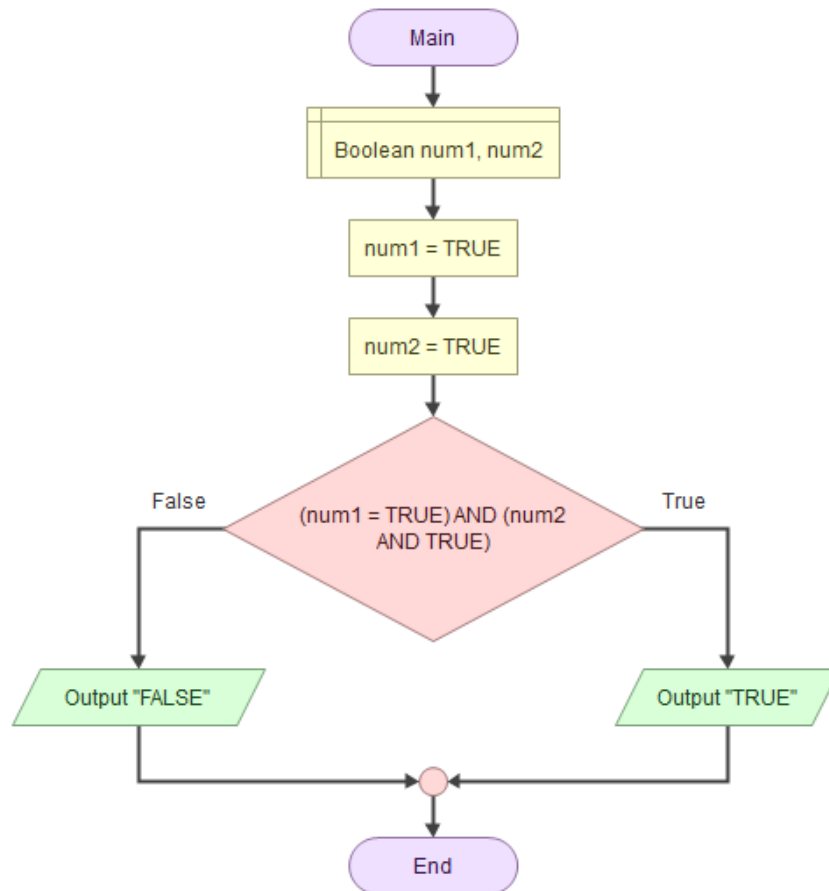2. Modify the blocks as following:
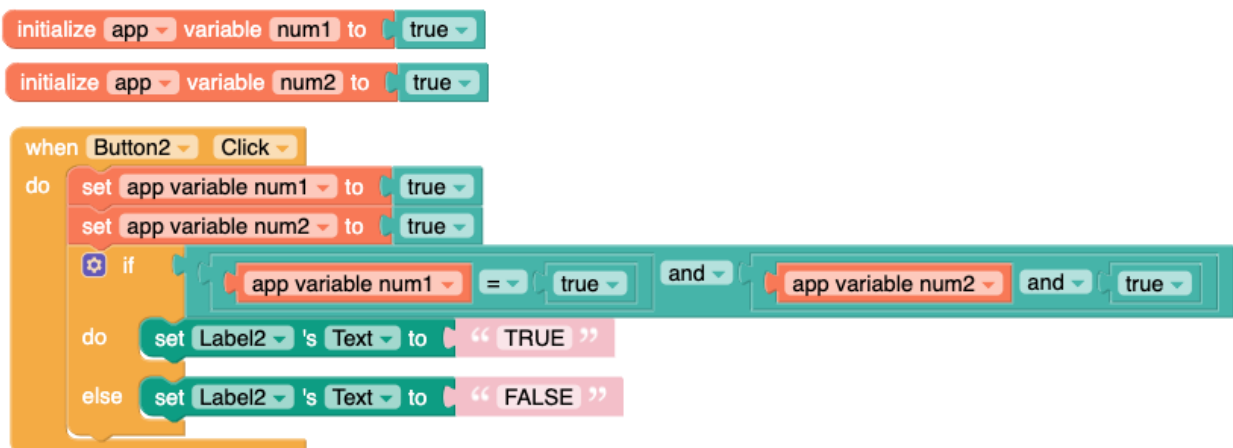
3. From the program which implementing the logic of the **if-then** statement above, complete the following table:

num1	num2	Text in Label1
TRUE	TRUE	TRUE
FALSE	TRUE	FALSE
TRUE	FALSE	FALSE

Hint: Chang value of "num1" and "num2" and run the program to test the answer.

4. From the program which implementing the logic of the **if-then** statement above, if we change the conditions and values in if statement as:

complete the following table:

num1	num2	Text in Label1
TRUE	TRUE	TRUE
FALSE	TRUE	TRUE
TRUE	FALSE	TRUE
FALSE	FALSE	TRUE

Hint: Chang value of "num1" and "num2" and run the program to test the answer.

5. From the program which implementing the logic of the **if-then** statement above, if we change the conditions and values in if statement as:
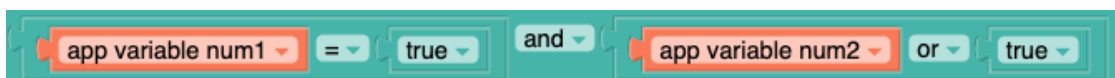

complete the following table:

num1	num2	Text in Label1
TRUE	TRUE	TRUE
FALSE	TRUE	FALSE
TRUE	FALSE	TRUE
FALSE	FALSE	FALSE

**Hint**: Chang value of "num1" and "num2" and run the program to test the answer.

Problem Set

1. Find the result of the following logical expressions given A = 2, B = 3, C = 5, and D = 8

Expression	Result Value
A < 5 and (B * C) >= 10	TRUE
A < B or (C < D * 2)	TRUE
(C + D) > (D / A) and (A – C) > B	FALSE
(100 * B) < (A * B * C * D) or C > B	FALSE
A > 10 and B > 9 and C > 8 and D > 7	FALSE

2. Find the value being stored in the variable "X" at the end of the following pseudocodes.

Algorithm	Value of X

BEGIN
   SET X = 10, Y = 20
   IF Y < X
      IF Y > 15
         X = X + 10 * Y
      ELSE
         X = X + Y / X
      ENDIF
   ELSE
      X = X - 5 * Y - X
   ENDIF
END
	X = -100

BEGIN
SET X = 10, Y = 20
IF Y > X
      IF Y < 15
         X = X + 10 * Y
      ELSE
         X = X + Y / X
      ENDIF
ELSE
      X = X - 5 * Y - X
ENDIF
END
	X = 12

3. From the following flowchart:
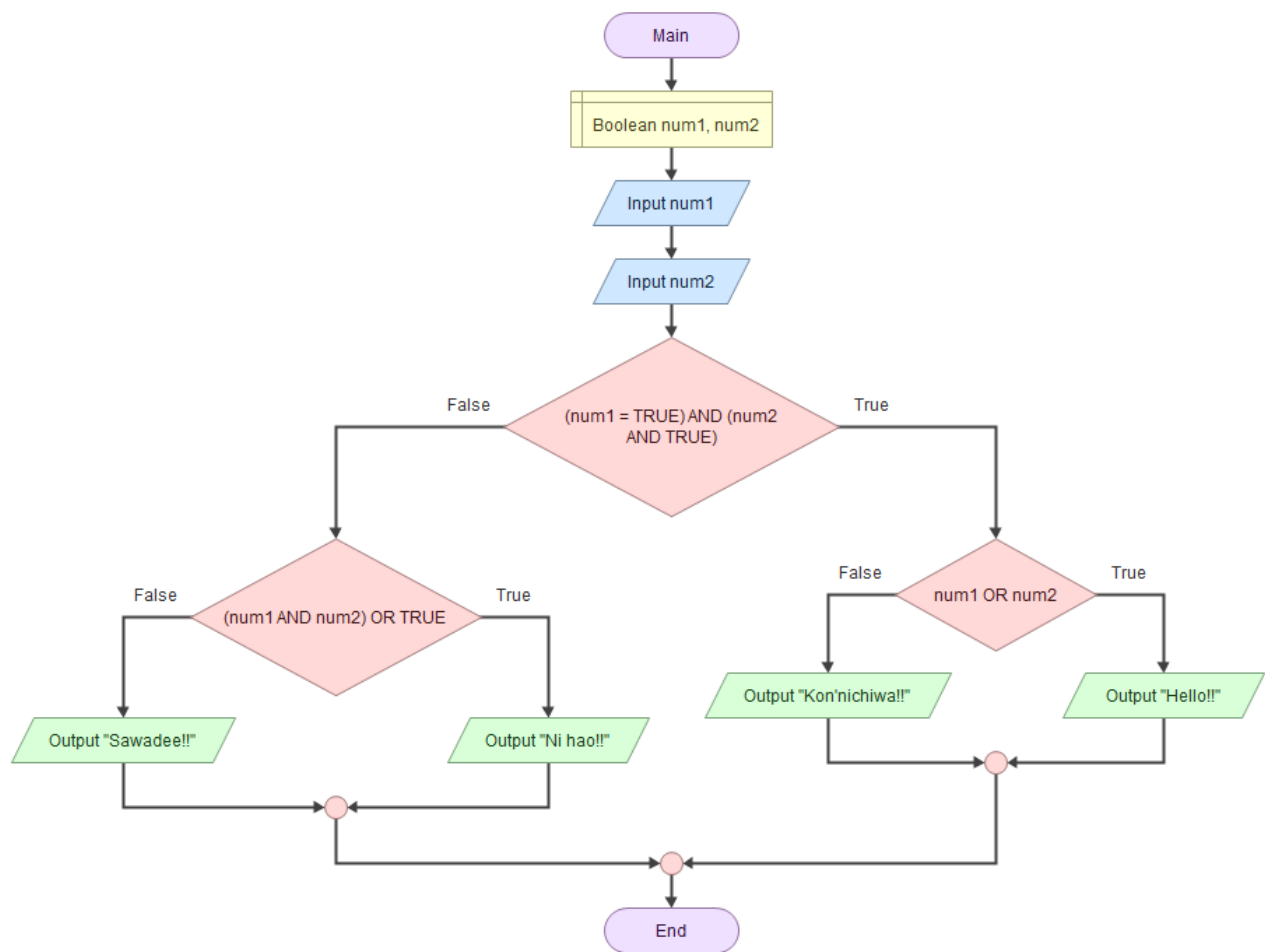
complete the following table:
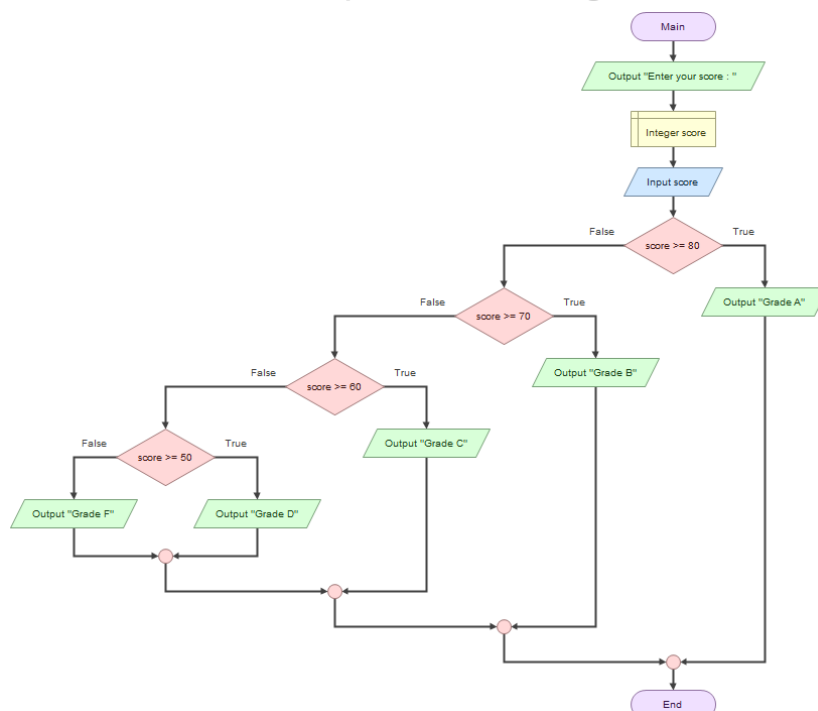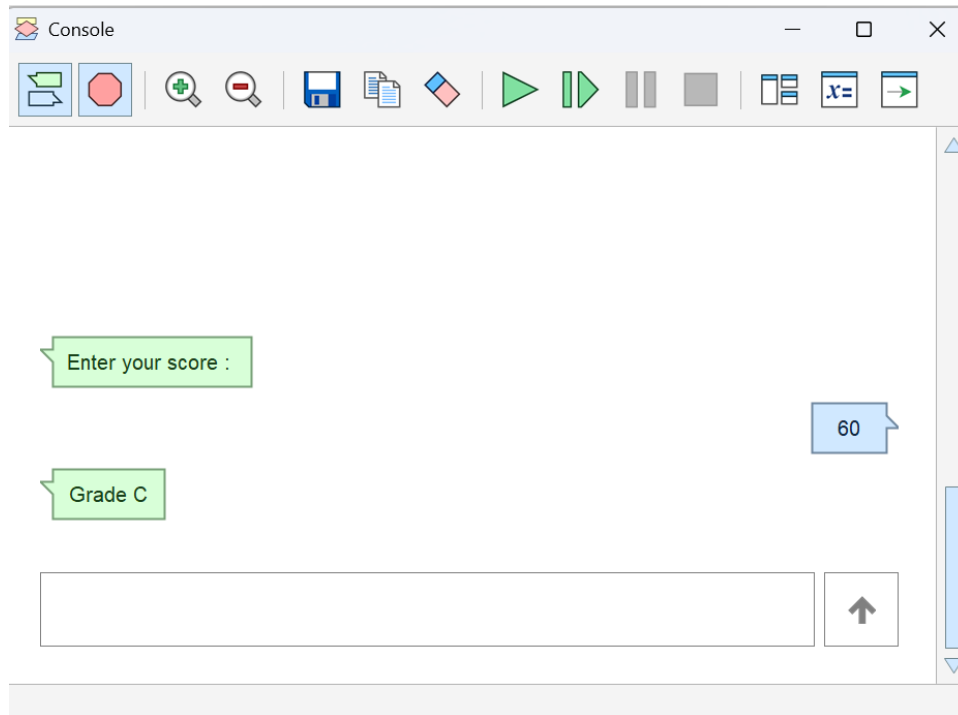
num1	num2	Output
TRUE	TRUE	Hello
FALSE	TRUE	Ni hao!!
TRUE	FALSE	Ni hao!!
FALSE	FALSE	Ni hao!!

Hint: You may need to create the given flowchart to test the answer.

4. Develop a program to calculate the grade based on the student's score. The criteria of grades are as follows:

Lower bound	Upper bound	Grade
80	100	A
70	79	B
60	69	C
50	59	D
0	49	F

a) Draw a flowchart of the program using **Flowgorithm**.

b) Create this program in **Thunkable** (Always create new screen!!).

Your score :

80

Button

Grade A

```
initialize app ▾ variable score to

when Button3 ▾ Click ▾
do   set app variable score ▾ to   Text_Input3 ▾ 's Text ▾
     + if      app variable score ▾ ≥ ▾ 80
       do   set Label6 ▾ 's Text ▾ to   " Grade A "
     else + if      app variable score ▾ ≥ ▾ 70
            do   set Label6 ▾ 's Text ▾ to   " Grade B "
          else + if      app variable score ▾ ≥ ▾ 60
                 do   set Label6 ▾ 's Text ▾ to   " Grade C "
               else + if      app variable score ▾ ≥ ▾ 50
                      do   set Label6 ▾ 's Text ▾ to   " Grade D "
                    else   set Label6 ▾ 's Text ▾ to   " Grade F "
```

5. Develop a program to computes the income tax in accordance with the following condition.
   - For the first 50,000 baht, the tax is 5%.
   - For the **next** 50,000 baht, the tax is 6%.
   - For the **next** 100,000 baht, the tax is 7%.
   - For the **next** 100,000 baht, the tax is 8%.
   - Then, the remaining tax is 10%

Test case:

Income	25,000	75,000	150,000	250,000	350,000
Tax	1,250	4,000	9,000	16,500	25,500

a) Draw a flowchart of the program using **Flowgorithm**.
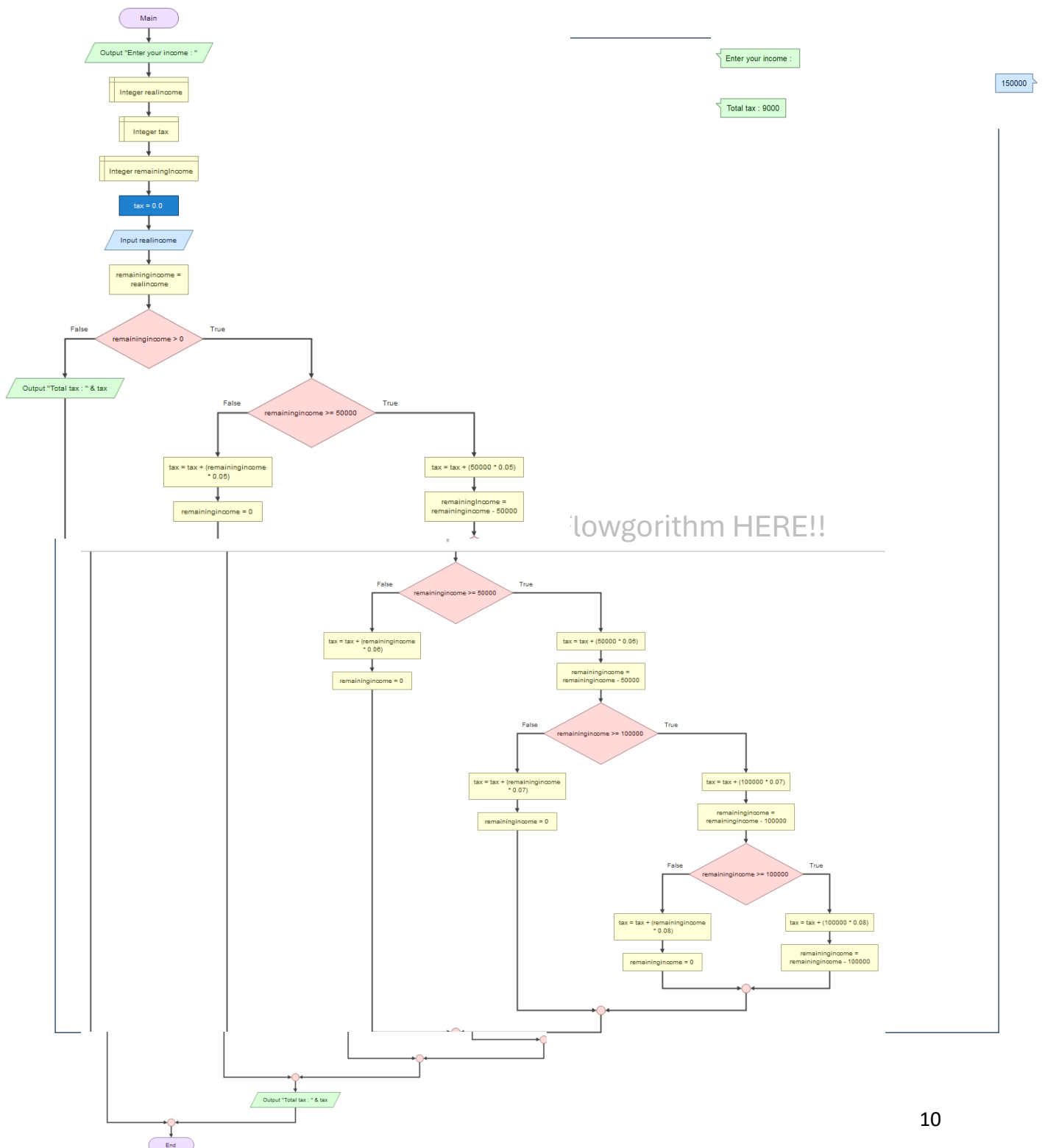
b) Create this program in **Thunkable** (Always create new screen!!).

Enter your income :

150000

Button

9000

```
initialize app variable realincome to
initialize app variable tax to

when Button4 Click
do  set app variable realincome to Text_Input4 's Text
    set app variable tax to 0
    if   app variable realincome > 0
    do   if   app variable realincome ≥ 50000
         do   set app variable tax to app variable tax + 50000 × 0.05
              set app variable realincome to app variable realincome - 50000
              if   app variable realincome ≥ 50000
              do   set app variable tax to app variable tax + 50000 × 0.06
                   set app variable realincome to app variable realincome - 50000
                   if   app variable realincome ≥ 100000
                   do   set app variable tax to app variable tax + 100000 × 0.07
                        set app variable realincome to app variable realincome - 100000
                        if   app variable realincome ≥ 100000
                        do   set app variable tax to app variable tax + 100000 × 0.08
                             set app variable realincome to app variable realincome - 100000
                             set Label8 's Text to app variable tax
                        else set app variable tax to app variable tax + app variable realincome × 0.08
                             set app variable realincome to 0
                             set Label8 's Text to app variable tax
                   else set app variable tax to app variable tax + app variable realincome × 0.07
                        set app variable realincome to 0
                        set Label8 's Text to app variable tax
              else set app variable tax to app variable tax + app variable realincome × 0.06
                   set app variable realincome to 0
                   set Label8 's Text to app variable tax
         else set app variable tax to app variable tax + app variable realincome × 0.05
              set app variable realincome to 0
              set Label8 's Text to app variable tax
    else set Label8 's Text to app variable tax
```