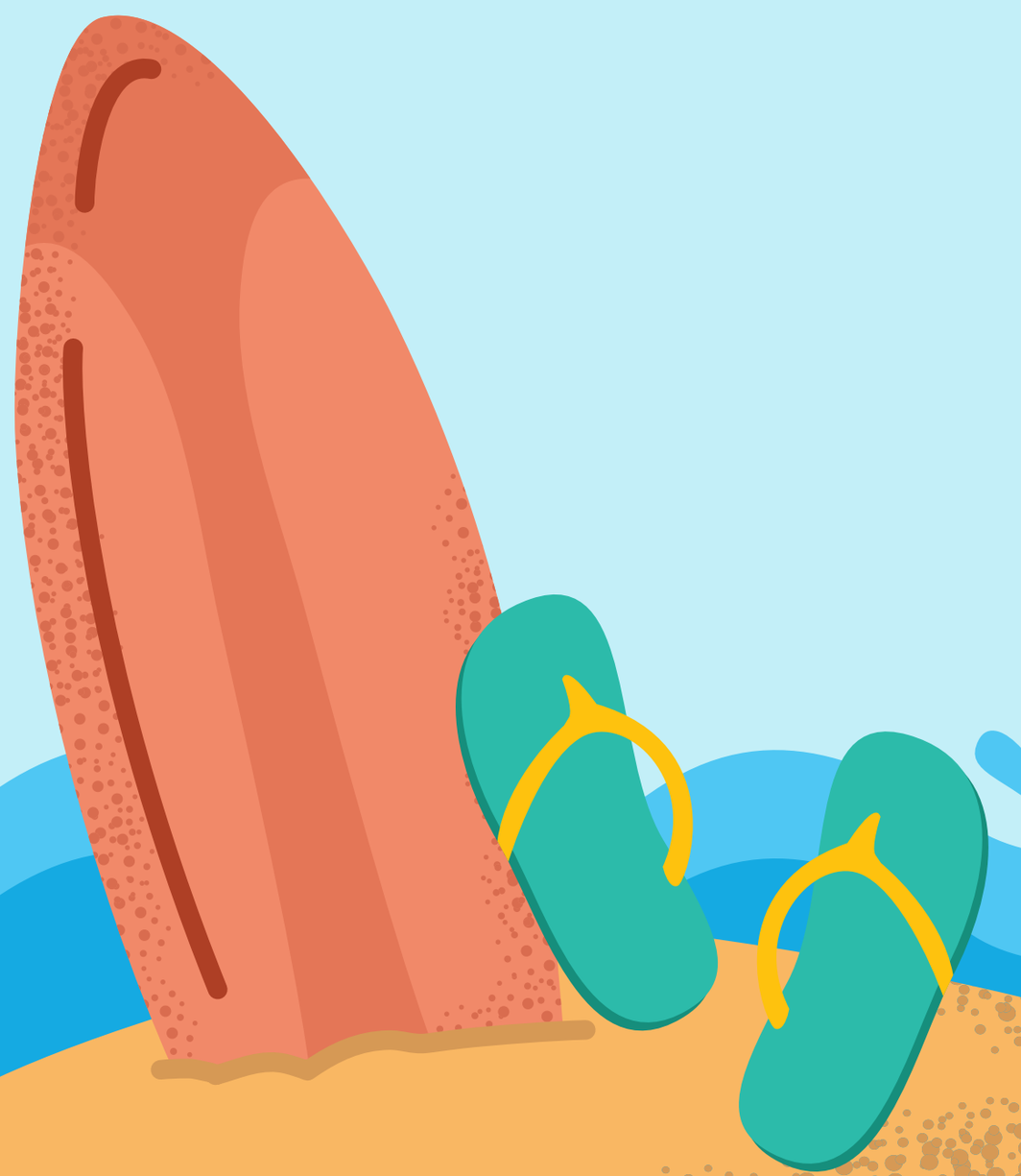
B.A.L.I

Basic Application Language from Indonesia

Kid's Manual Book

by Samantha Benedicta



contact us on:

www.baliprog.com

esrc.bali

esrc.bali

Esrc.bali@gmail.com

Bali Esrc

Introduction

Quick Summary

Hey Kids! Are you ready to discover a new and easier way to learn programming?

BALI (Basic Application Language from Indonesia) is a new programming language created by Dr. Nathan Madutujuh from ESRC, Bandung, Indonesia. The name is taken from famous Bali Island, the tropical paradise in Indonesia.
BALI can be used to create useful applications for various fields in a very short time for elementary to advanced level students

Features

- Visual objects
- Event driven programming
- Timers
- MIDI music
- Control structures
- Strings
- Files
- Math
- Graphics
- Vector
- Matrix
- etc.

What's New?

Event Driven Programming Language

You can use an object name and object parameters directly inside any expression (object name can be used for variable name)

Any value will be displayed automatically in object's visual part.

Nonvisual and Visual Objects

A visual object can be added, renamed, and set its parameters accordingly. If a visual object is also reflecting a variable, the name of the visual object should be the variable name

Online and Offline Community

Share your application on the market and communities that will be provided in various cities

Learning Examples

Several examples and tutorials have been provided inside BALI, so a thick and difficult to read manual is not needed anymore

PROGRAMMING MUST BE FUN!

Table of Content

Non Visual Programming Tutorial

Visual Programming Tutorial

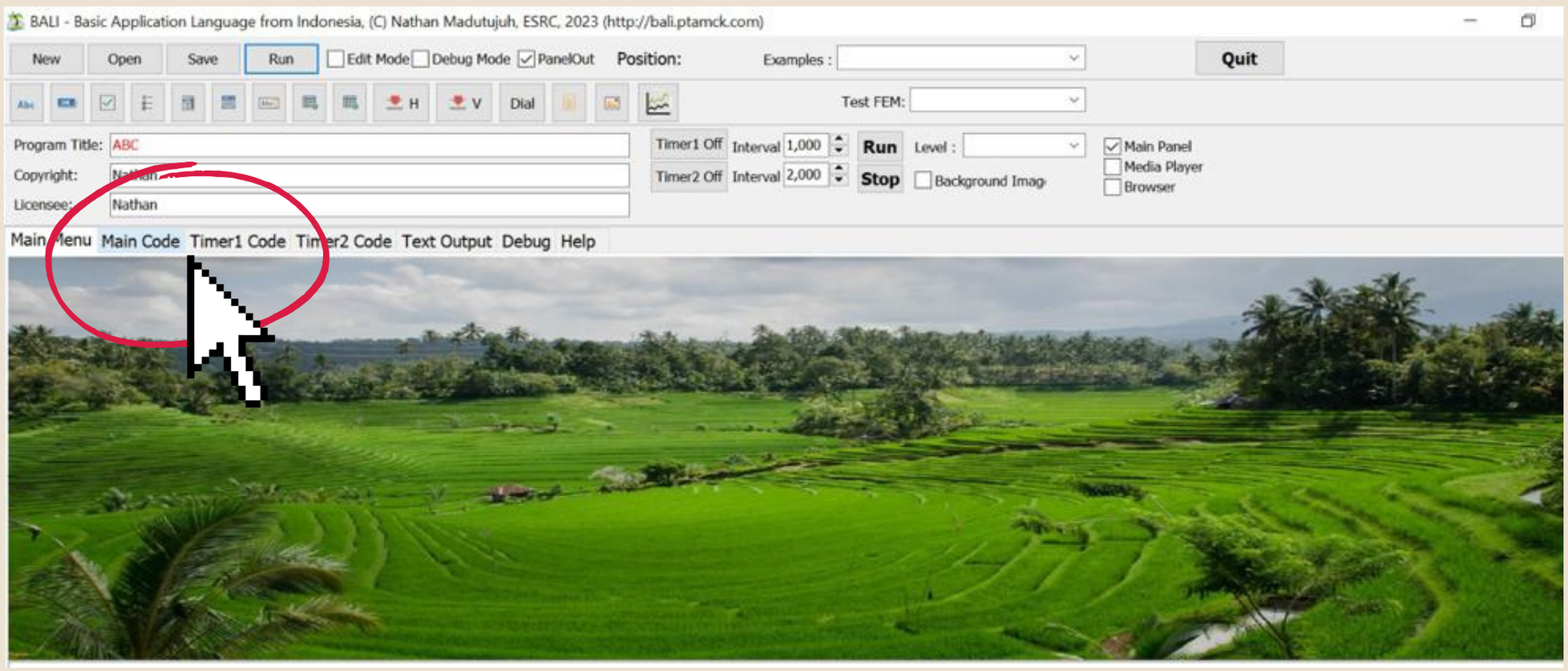
Non Visual Programming Tutorial

#Tutorial 1

"Hello"

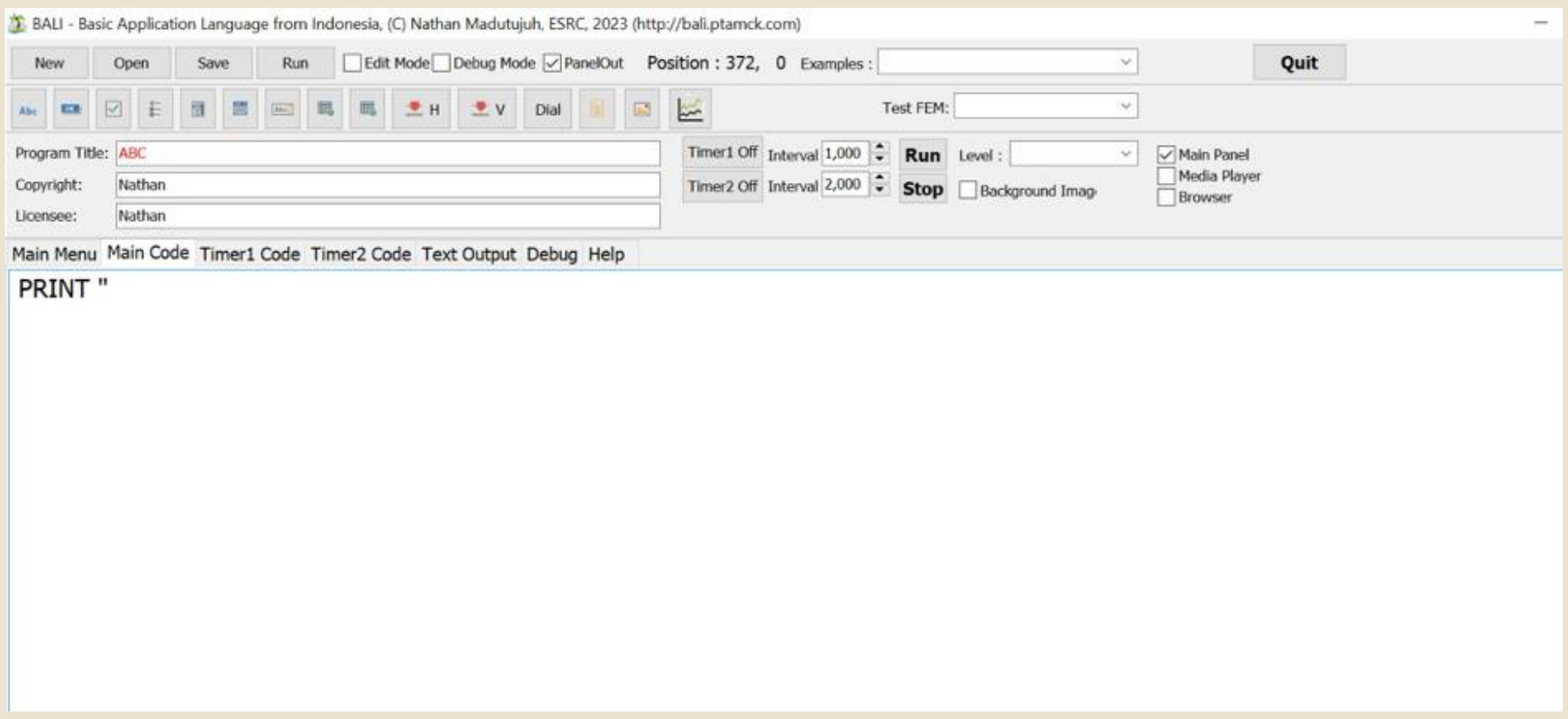
Step 1

Open the programme and click MAIN CODE!



Step 2

Type PRINT on the MAIN CODE page!



NOTE

Print function is used to display text or numbers on the screen

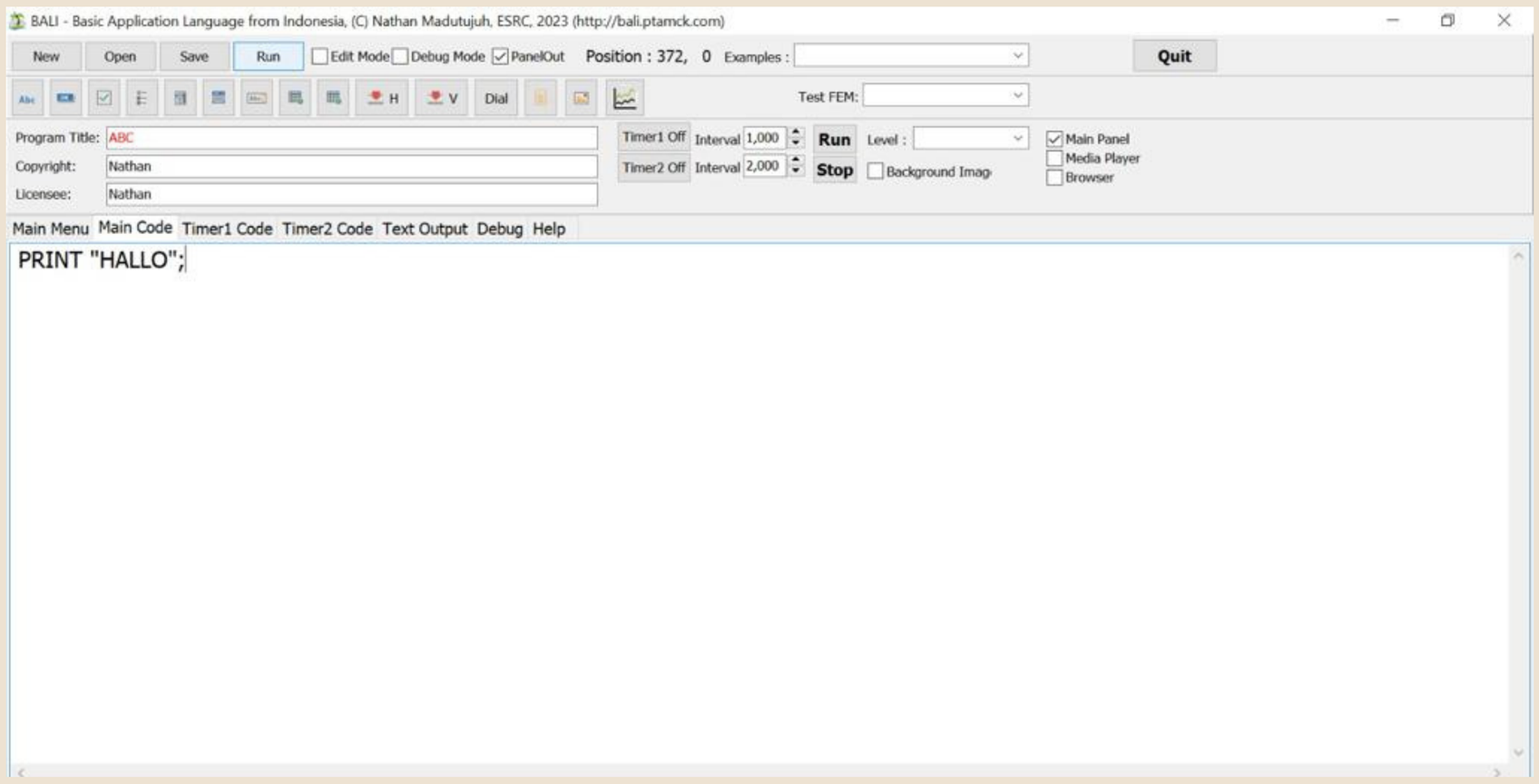
Text or numbers will be exactly displayed if it is enclosed in double quotation marks ("")

#Tutorial 1

"Hello"

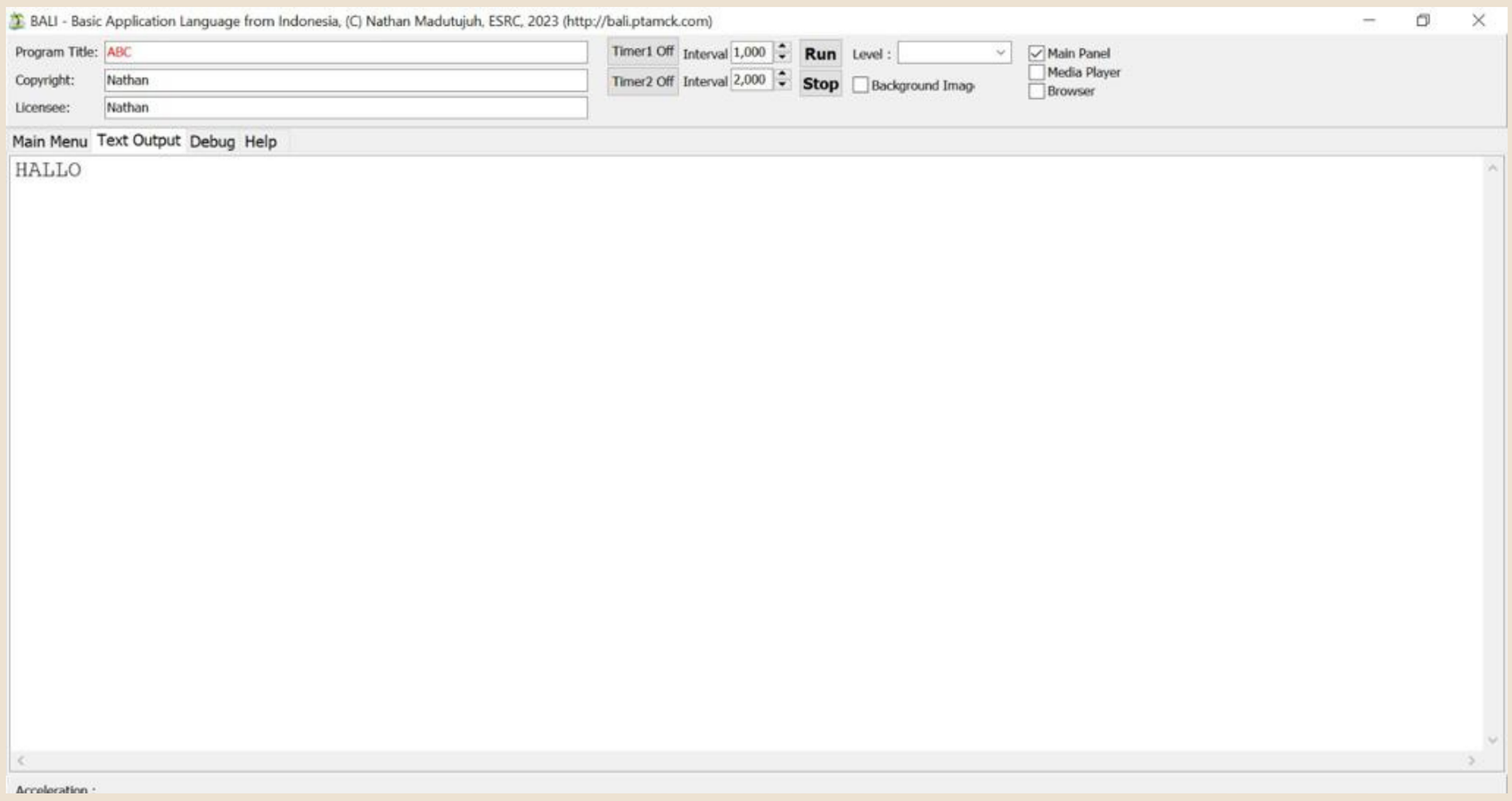
Step 3

Type "Hello" on screen, end the sentence using ; (semicolon)



Step 4

Click RUN to see the results on MAIN MENU and TEXT OUTPUT

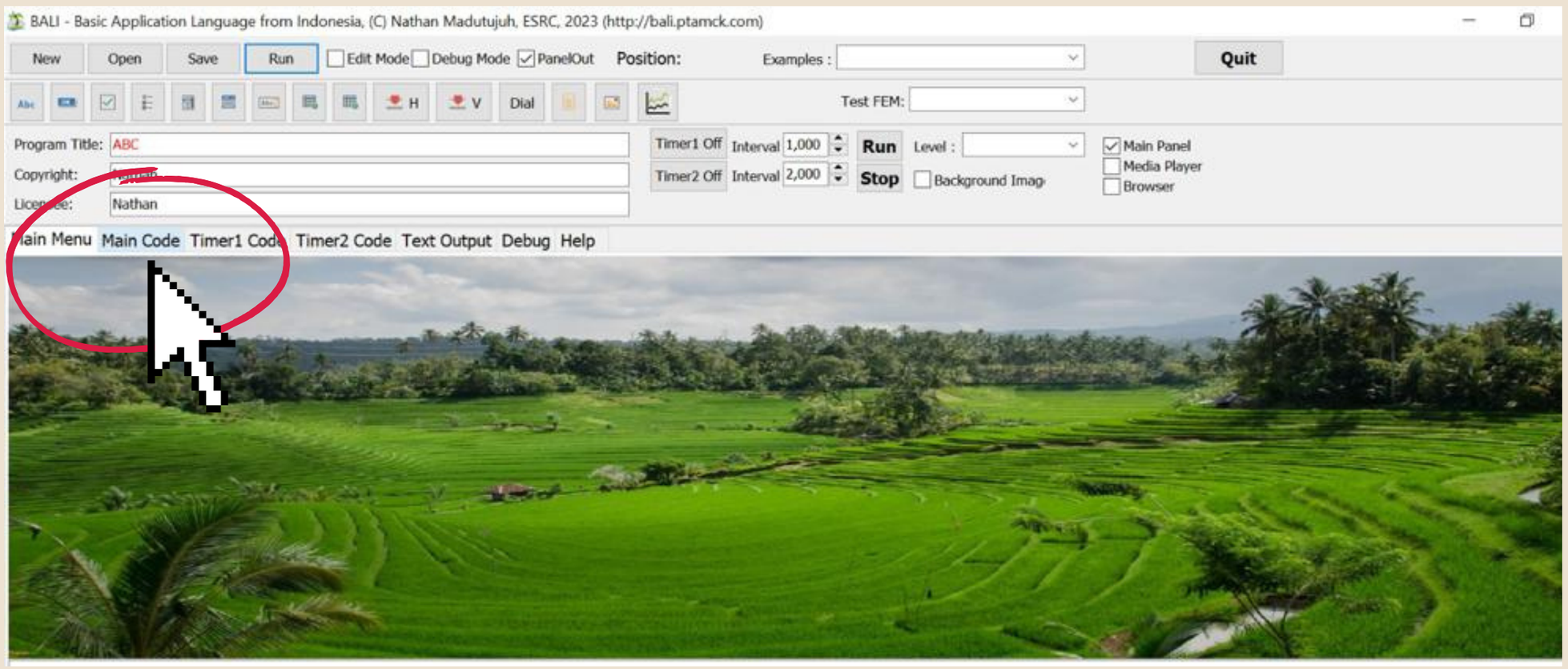


#Tutorial 2

C = A + B

Step 1

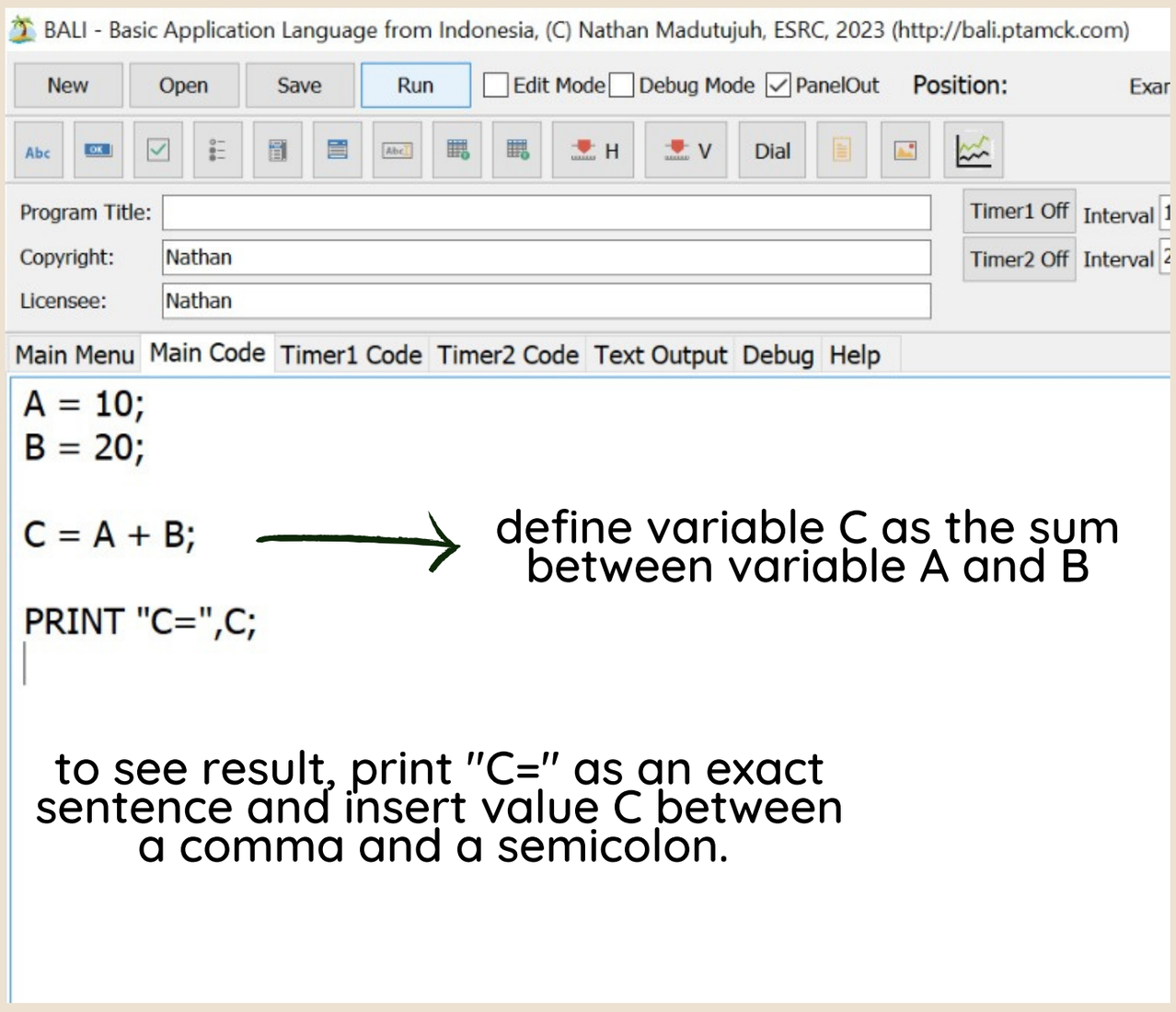
Open the programme and click MAIN CODE!



Step 2

Type your desired variables and insert each values of the variables

*this example uses A, B, and C as variables



Separate sentence and value using , (comma)

variable placed between a comma (,) and a semicolon (;) is the result of the operation depends on the formula entered

NOTE

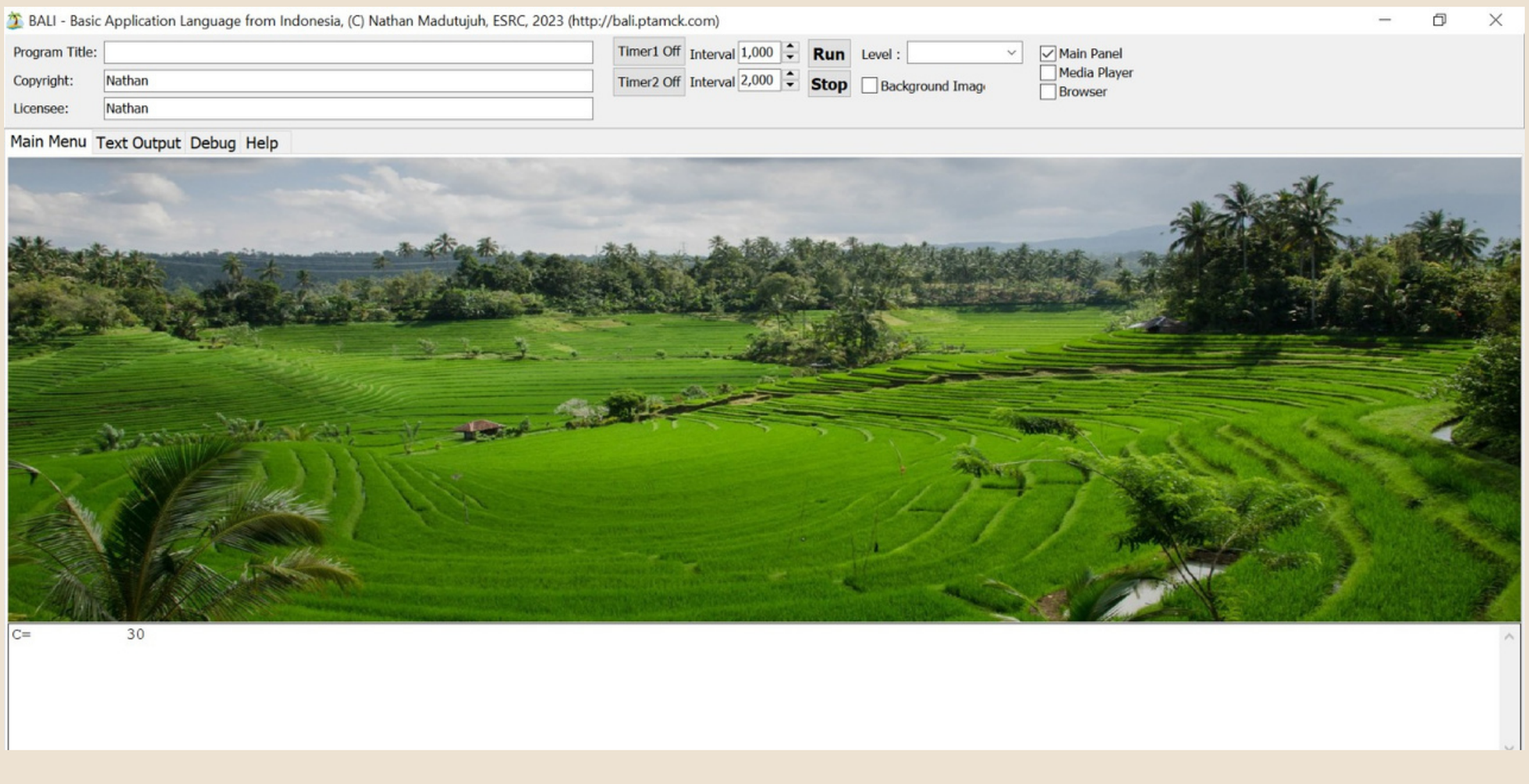
use = to define each value and end the sentence with ;

#Tutorial 2

C = A + B

Step 3

click RUN to see the result on MAIN MENU or TEXT OUTPUT!



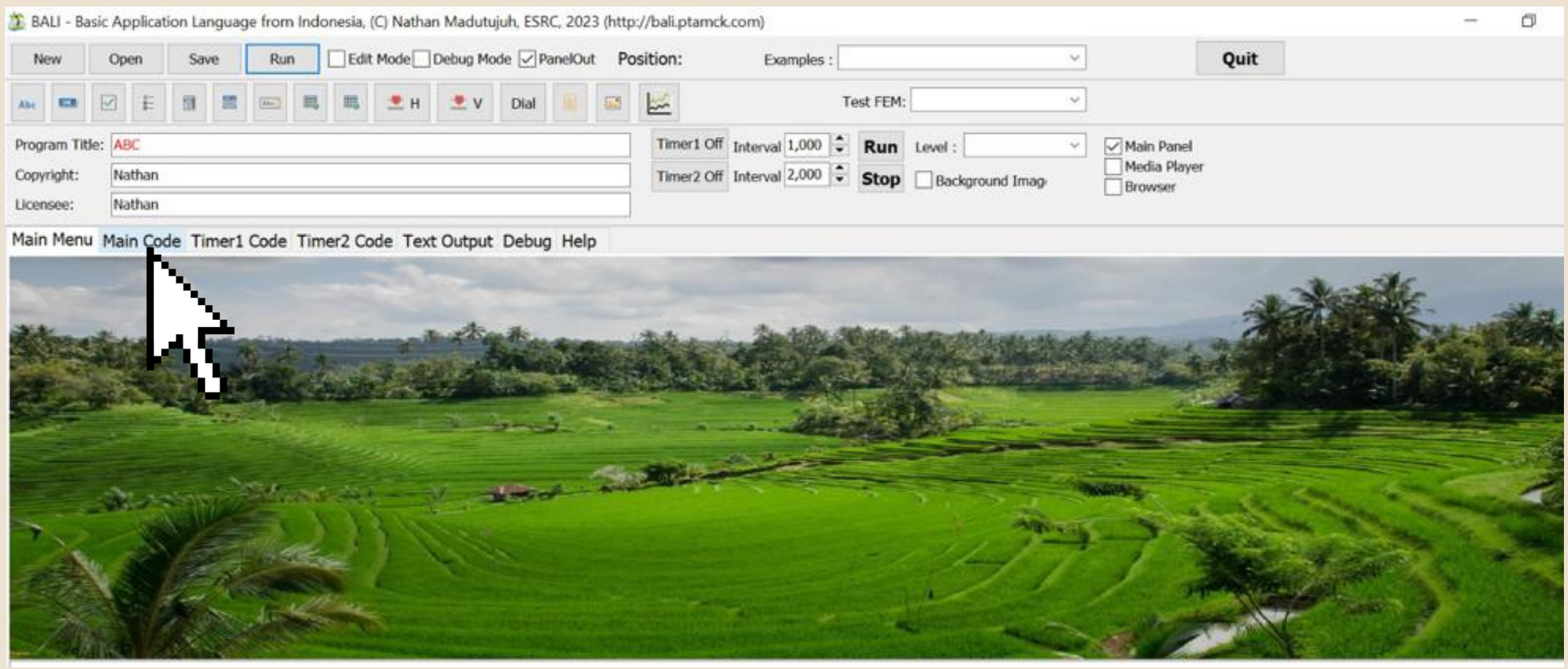
#Tutorial 3

"ABC Formula"

a simple quadratic equation solver

Step 1

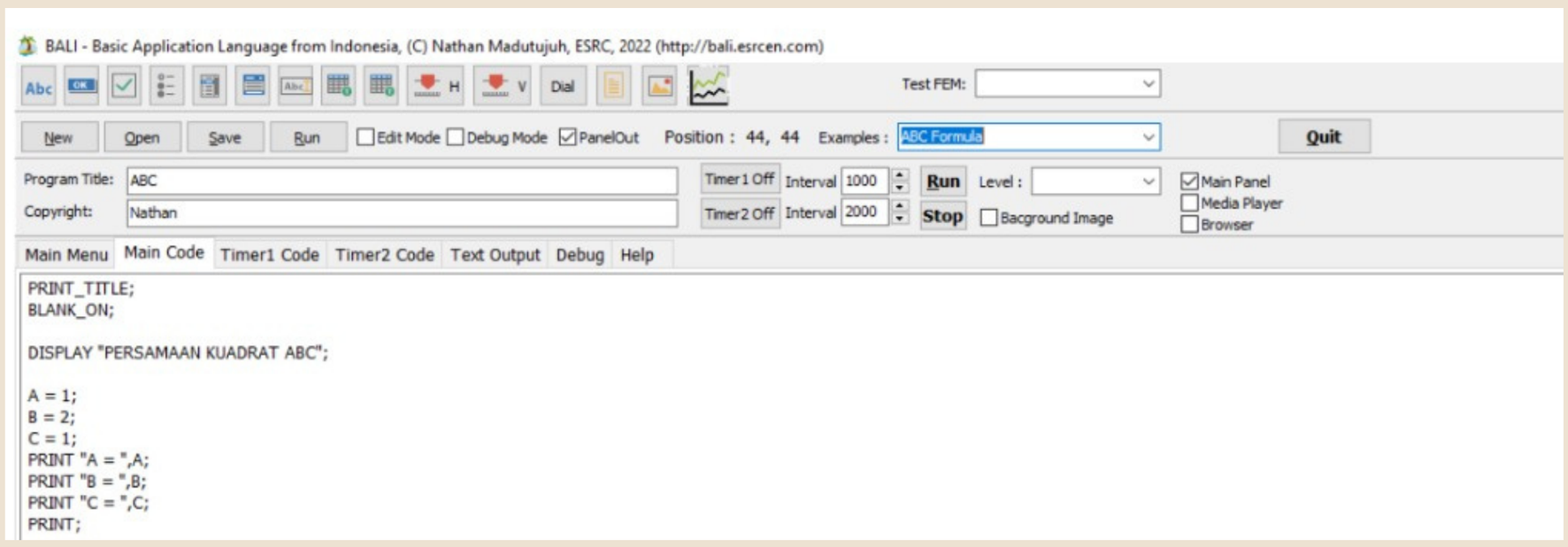
Open the programme and click MAIN CODE!



Step 2

a quadratic equation given is

$X^2 + 2X + 1$ in form of $AX^2 + BX + C$



so, in order for it to be calculated, we need to firstly define each variable with their values. Print each variables to see for example, A = 1 on screen

#Tutorial 3

"ABC Formula"

a simple quadratic equation solver

Step 3

```
DISK = B*B - 4*A*C;
PRINT "DISK = ",DISK;
PRINT;
IF (DISK < 0) {PRINT("NO ROOTS"); STOP}
X1 = (-B + SQRT(DISK))/(2*A);
X2 = (-B - SQRT(DISK))/(2*A);
```

- to use ABC formula, we must know the discriminant value of the equation. It is presented by variable DISK.
- print variable DISK, to see the discriminant value
- insert If function to know how many solutions are available

note

B^2 -4AC = 0 (1 real solution)
B^2 -4AC < 0 (2 imaginary solution)
B^2 -4AC > 0 (2 real solution)

if (DISK < 0) {PRINT ("NO ROOTS");
STOP}

first clause/ statement — the order to yes answers

definition:
if discriminant value is lower than 0, the programme will be stopped since there will be no roots to the equation.

(...) is used to write 1 statement
{...} is used to write more than one statement

X1 AND X2 is written as NO answers to the statement in if function

$$X1 = \frac{-B - \sqrt{B^2 - 4AC}}{2*A} = DISK$$

definition:
if discriminant value is not lower than 0, there will be 1 or 2 roots for the answer. Then the programme shall proceed to the ABC formula.

$$X2 = \frac{-B + \sqrt{B^2 - 4AC}}{2*A}$$

So, X1 and X2's values can be written as

X1 = (-B + (SQRT(DISK)) / (2*A)
X2 = (-B - (SQRT(DISK)) / (2*A)

SQRT = square root
* = Multiply
/ = Divide

#Tutorial 3

"ABC Formula"

a simple quadratic equation solver

Step 5

Print "X1=" as an exact sentence, and X1 value by putting X1 between a comma and semicolon. Do the same thing with X2

```
PRINT "X1 = ",X1;
PRINT "X2 = ",X2;
```

Step 6

Click RUN and see the result in Text Output

#Tutorial 3

"ABC Formula"

a simple quadratic equation solver

Full Code Preview

BALI - Basic Application Language from Indonesia, (C) Nathan Madutujuh, ESRC, 2022 (http://bali.esrcen.com)

Test FEM:

New | Open | Save | Run | Edit Mode | Debug Mode | PanelOut | Position : 44, 44 | Examples : ABC Formula | Quit

Program Title: ABC | Timer1 Off | Interval 1000 | Run | Level : | Main Panel

Copyright: Nathan | Timer2 Off | Interval 2000 | Stop | Bacground Image | Media Player | Browser

Main Menu | Main Code | Timer1 Code | Timer2 Code | Text Output | Debug | Help

```
PRINT_TITLE;
BLANK_ON;

DISPLAY "PERSAMAAN KUADRAT ABC";

A = 1;
B = 2;
C = 1;
PRINT "A = ",A;
PRINT "B = ",B;
PRINT "C = ",C;
PRINT;

DISK = B*B - 4*A*C;
PRINT "DISK = ",DISK;
PRINT;
IF (DISK < 0) {PRINT("NO ROOTS"); STOP}
X1 = (-B + SQRT(DISK))/(2*A);
X2 = (-B - SQRT(DISK))/(2*A);

PRINT "X1 = ",X1;
PRINT "X2 = ",X2;
```

NOTE:

Print_Title; a function to print the title of programme (program title)

Blank_On; the programme will show if we enter blank spaces

Display "....."; a box will appear showing the text between quotation marks, the box will disappear if we click OK.

Visual Programming Tutorial

Visual Programming Concepts

Objects can have value that can be used directly in any expression using its name as variable.

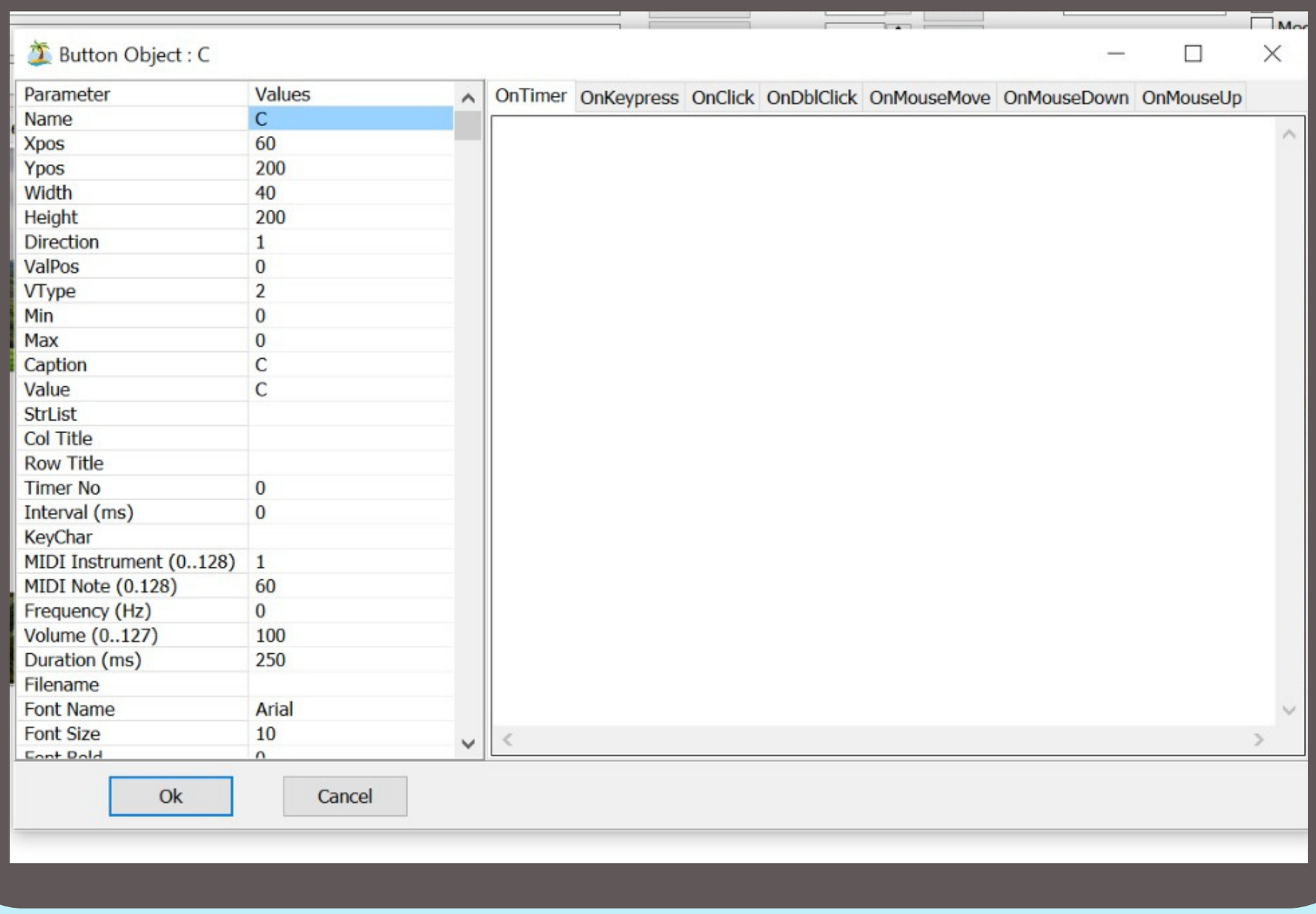
If only the name of the object is used as variable, the value will be default according to the type of the object.

Other object parameters can be accessed also by using the following syntax:
OBJECTNAME.parametername

A.Left **A.FontSize** **A.Value** **A.Text**

***example**

Object parameters can be changed during edit mode interactively, through the Object Parameters Window:



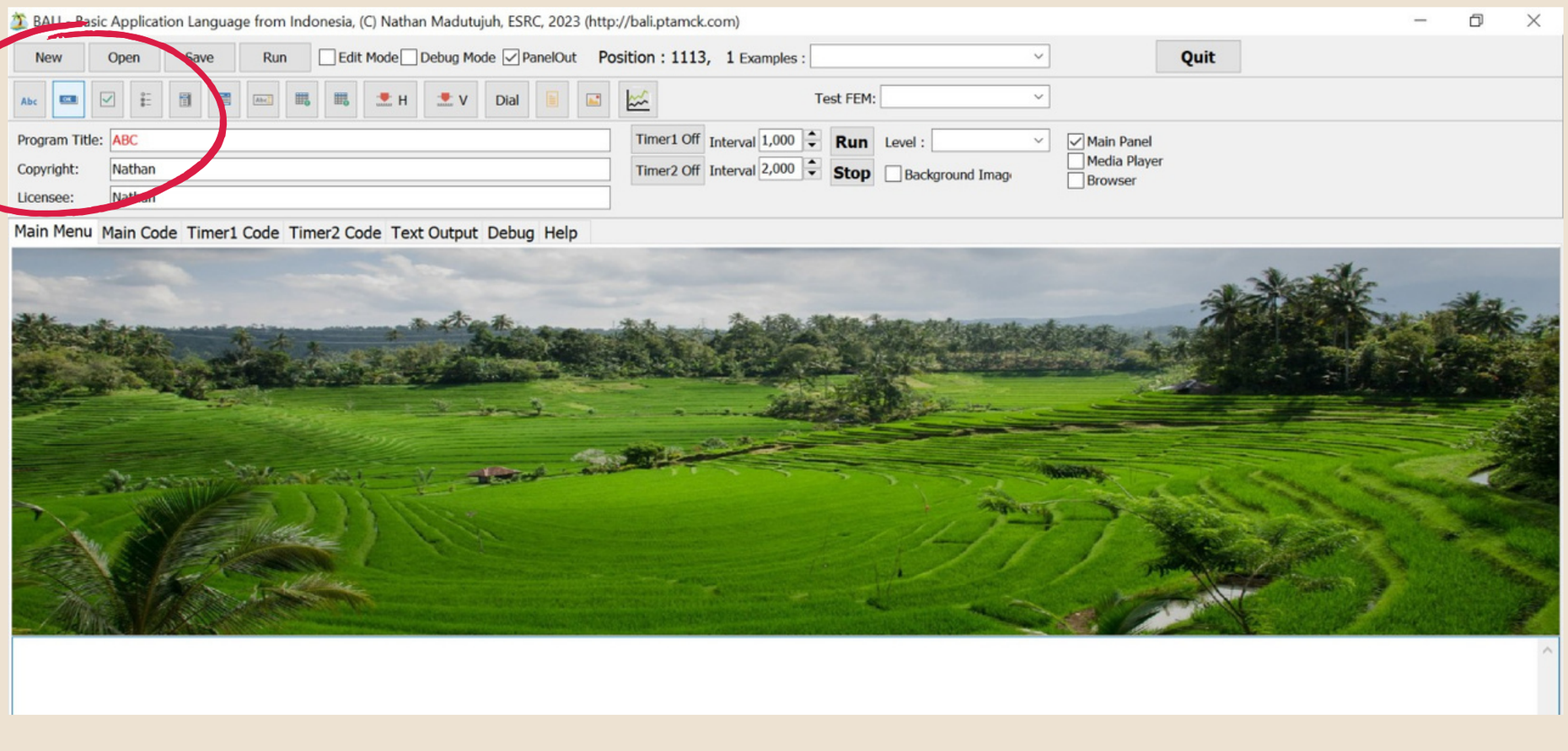
#Tutorial 4

"Visual Programming"

a simple calculator using edit button

Step 1

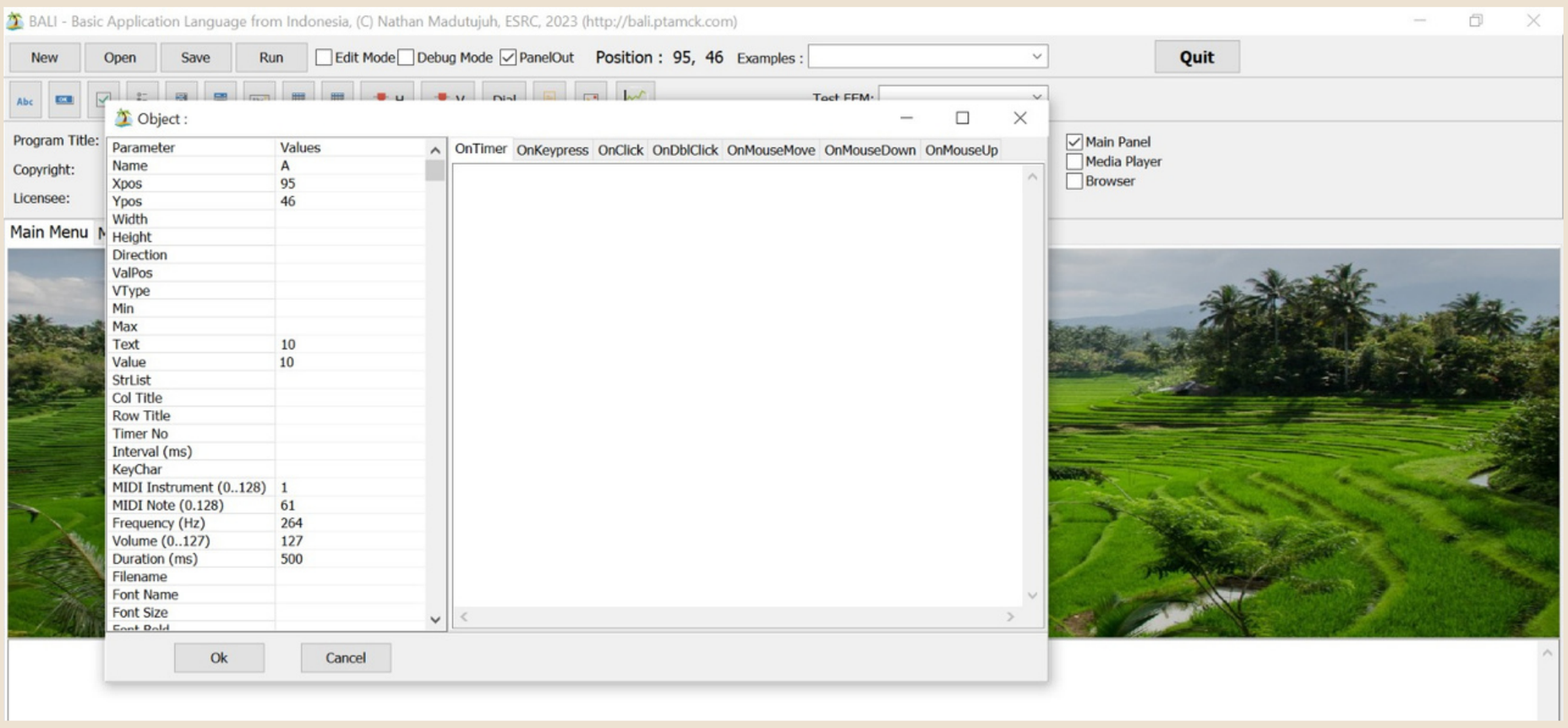
Open the programme and click MAIN MENU!



Insert edit button and click anywhere to place it

Step 2

Change the NAME of the first variable to A, insert the TEXT and VALUE of the button



*text = something that is displayed on the button

*value = value of the button that can be operated by mathematical operations

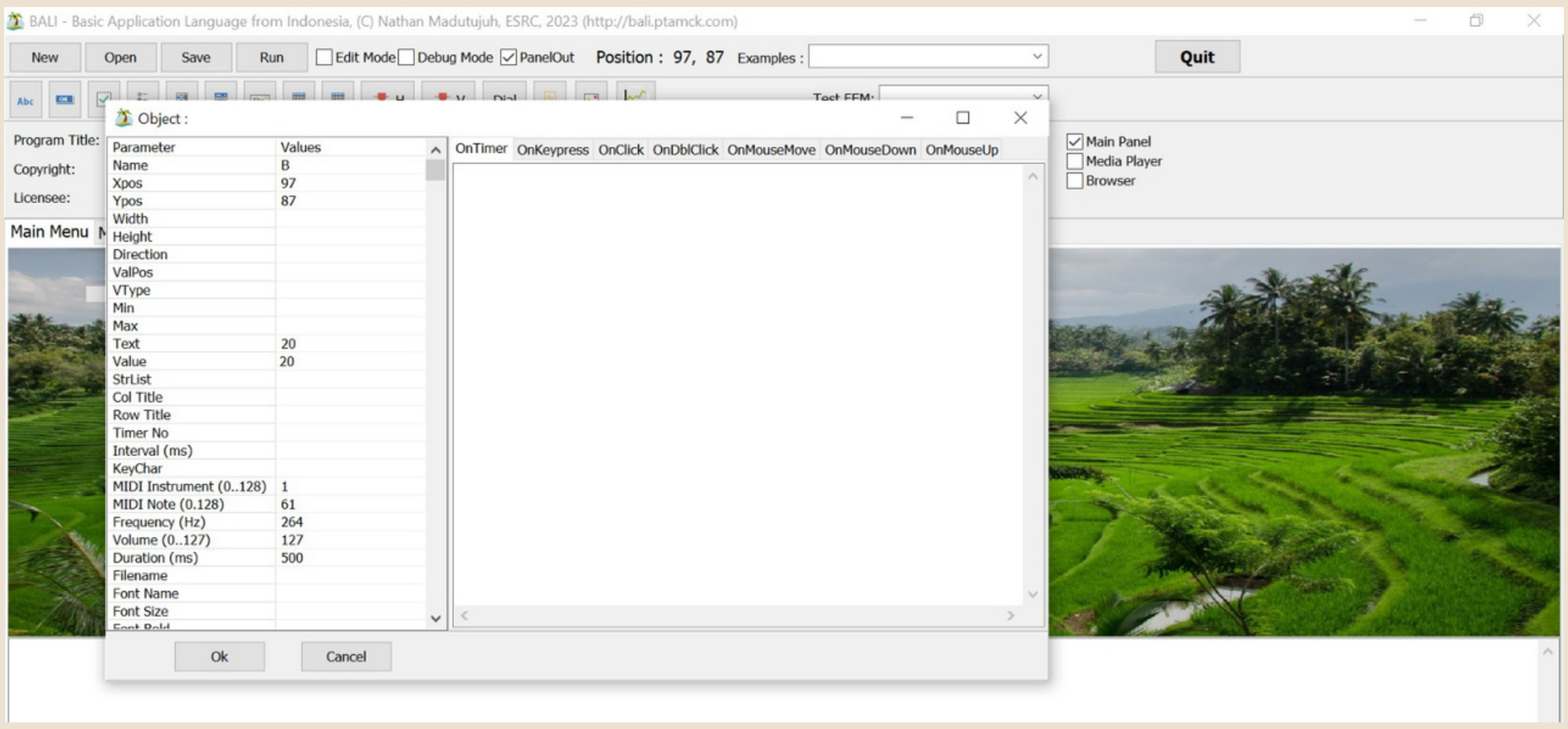
#Tutorial 4

"Visual Programming"

a simple calculator using edit button

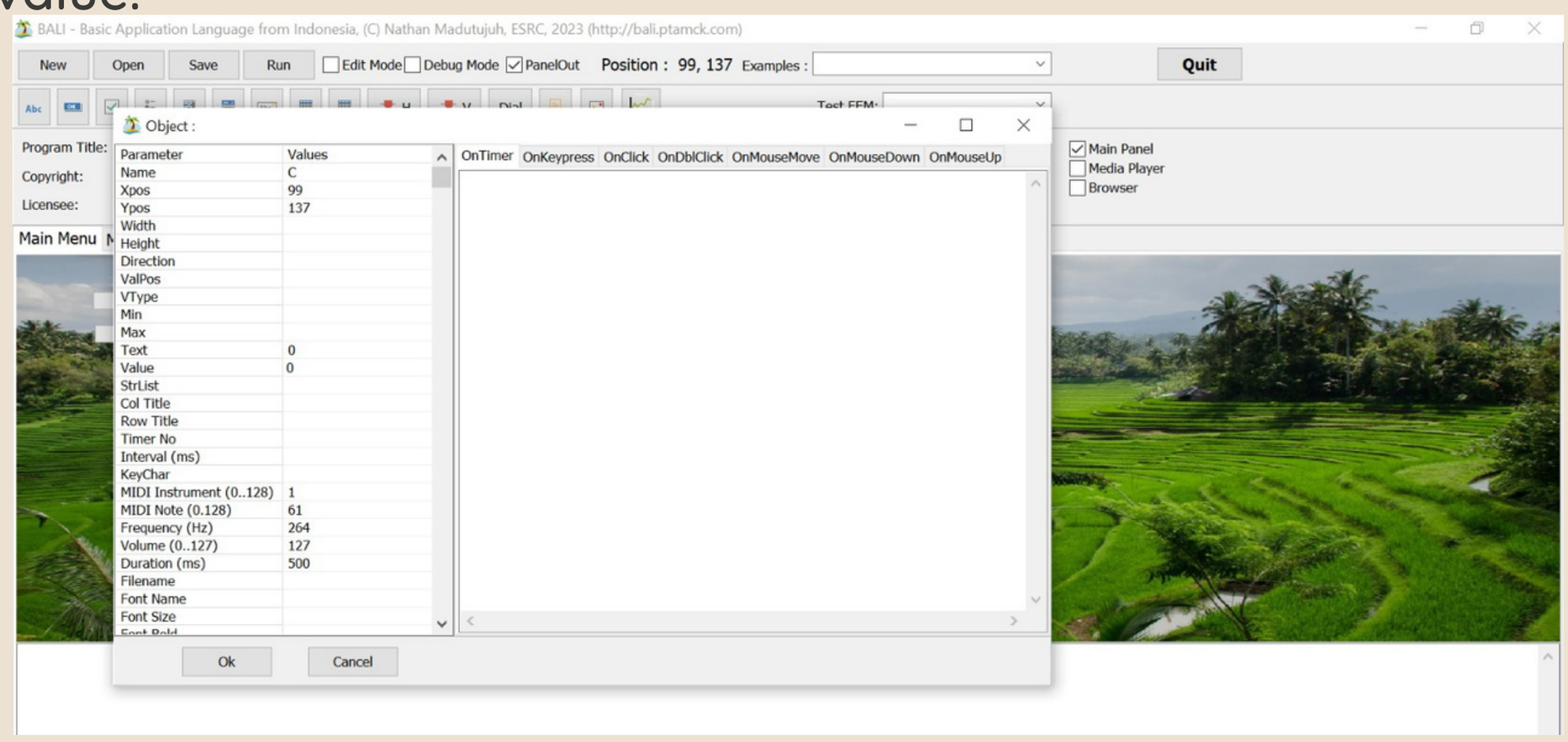
Step 3

Insert second button and NAME it B, fill the TEXT and VALUE with 20



Step 4

Insert second button and NAME it C, fill the TEXT and VALUE with 0. (Variable C will be the result of sum between A and B value.



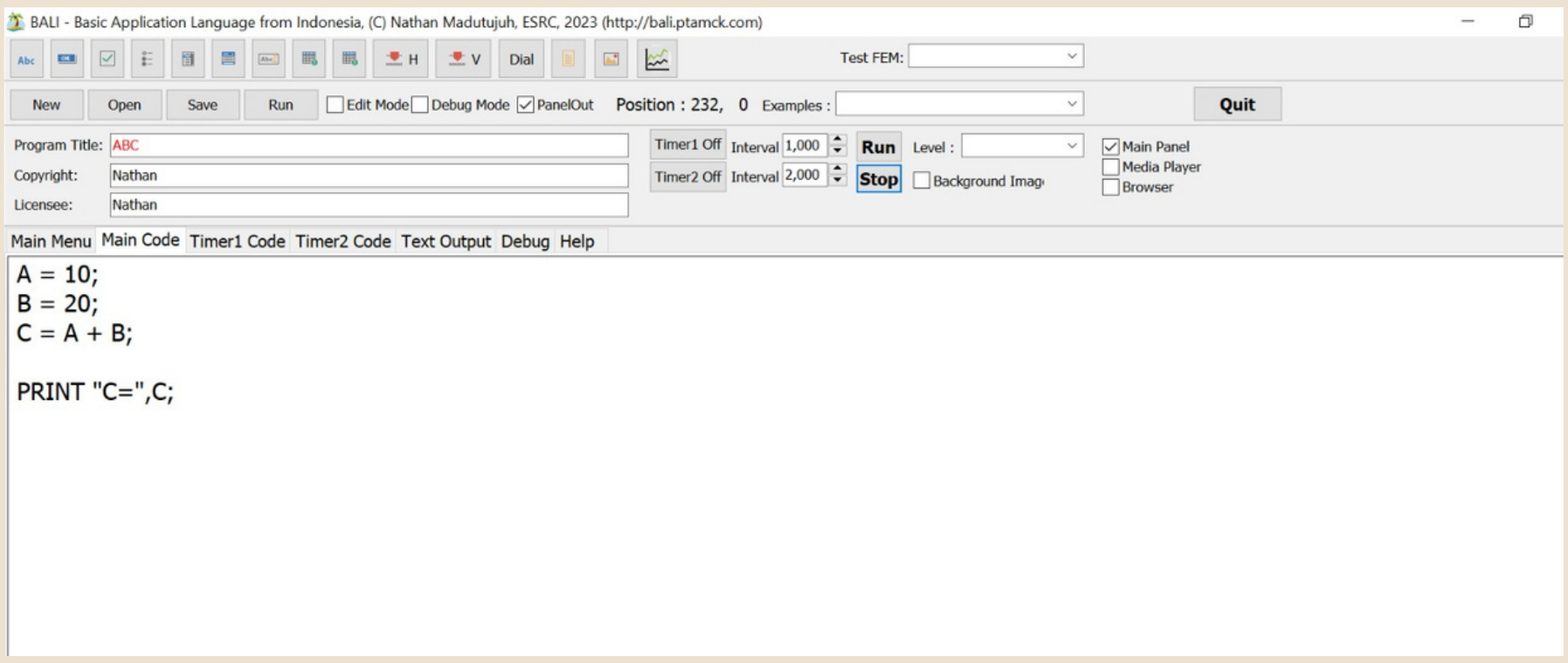
#Tutorial 4

"Visual Programming"

a simple calculator using edit button

Step 5

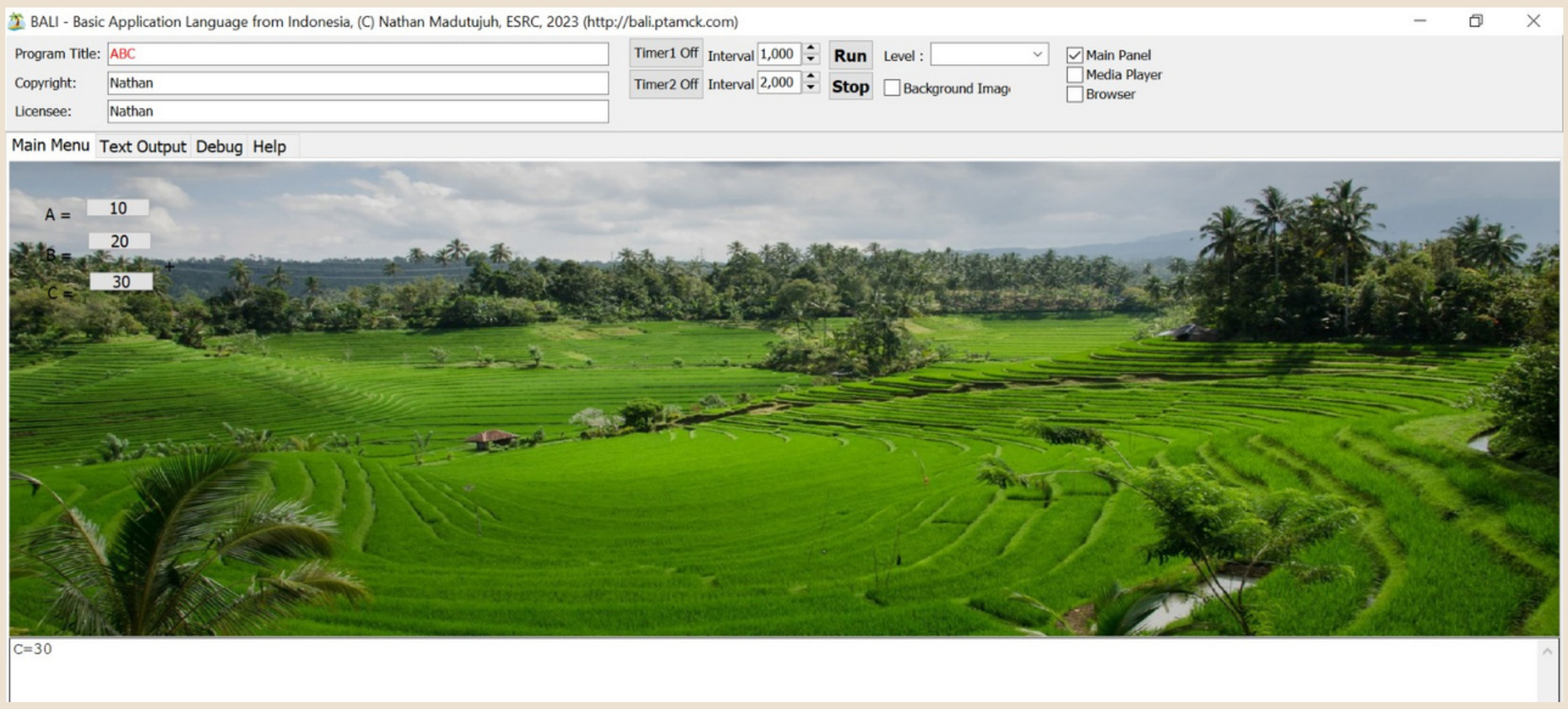
Click main code and define each variables with their values.



define variable C as the sum between variable A and B, and print C value to see the result of sum.

Step 6

Click RUN to see the result, on main menu, C edit button will present A + B. The value changes from 0 to 30.

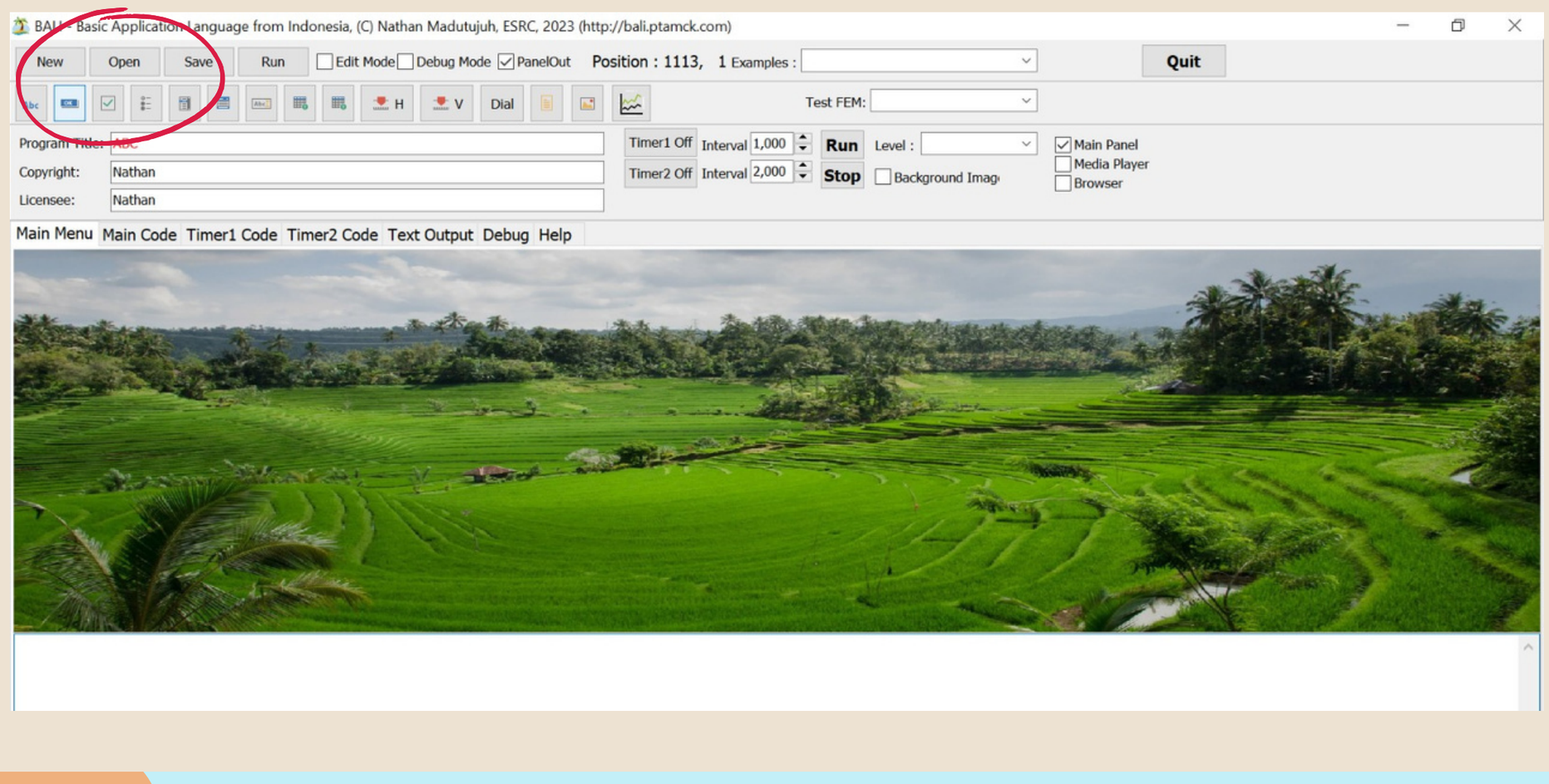


#Tutorial 5

"Hello Programme"

Step 1

Open the programme and click MAIN MENU!

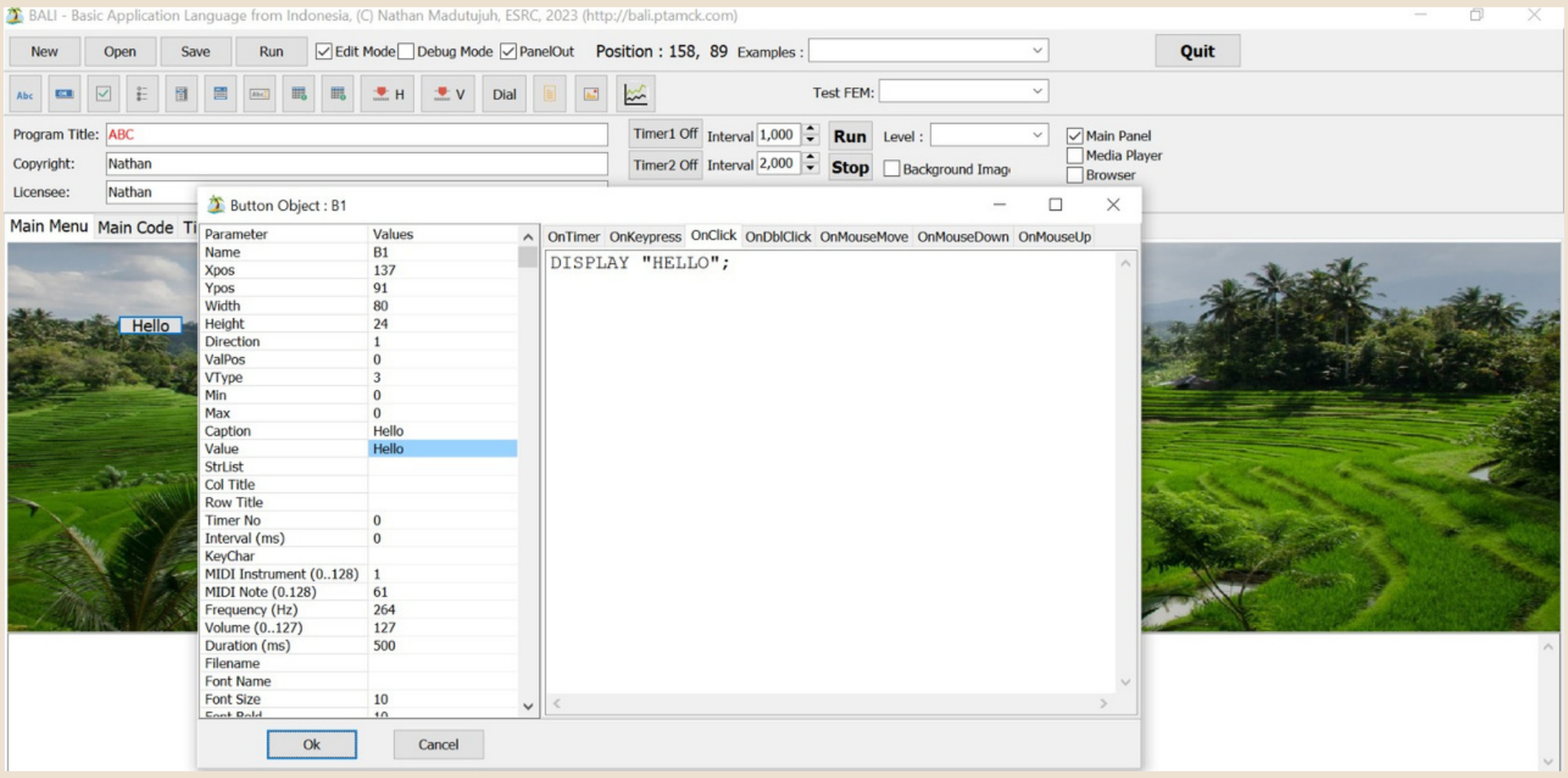


Insert edit button and click anywhere to place it

Step 2

Change the TEXT and VALUE into HELLO and choose the Onclick page

Type the order DISPLAY "HELLO";



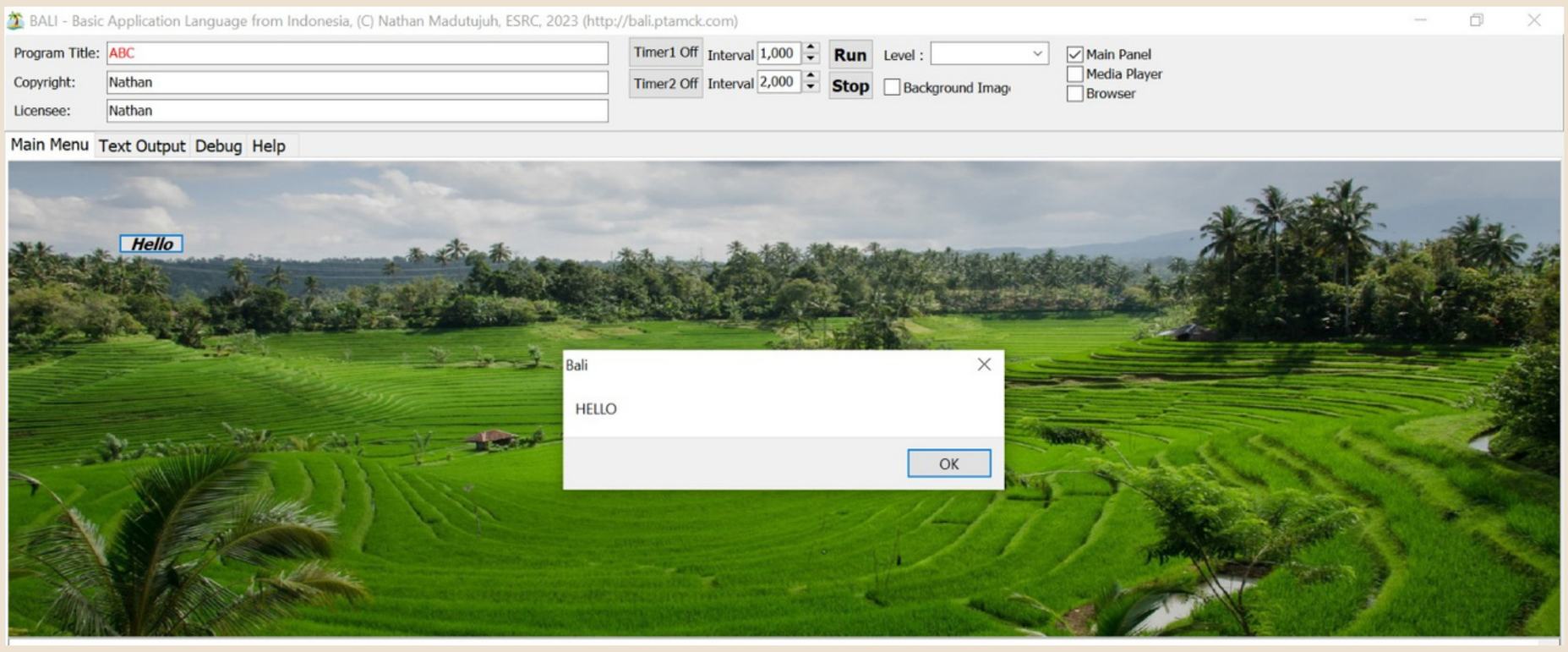
*Display = A box will appear on screen when the programme is running, and will disappear users click OK

#Tutorial 5

"Hello Programme"

Step 3

Click RUN then a box will appear. Click OK to end the programme

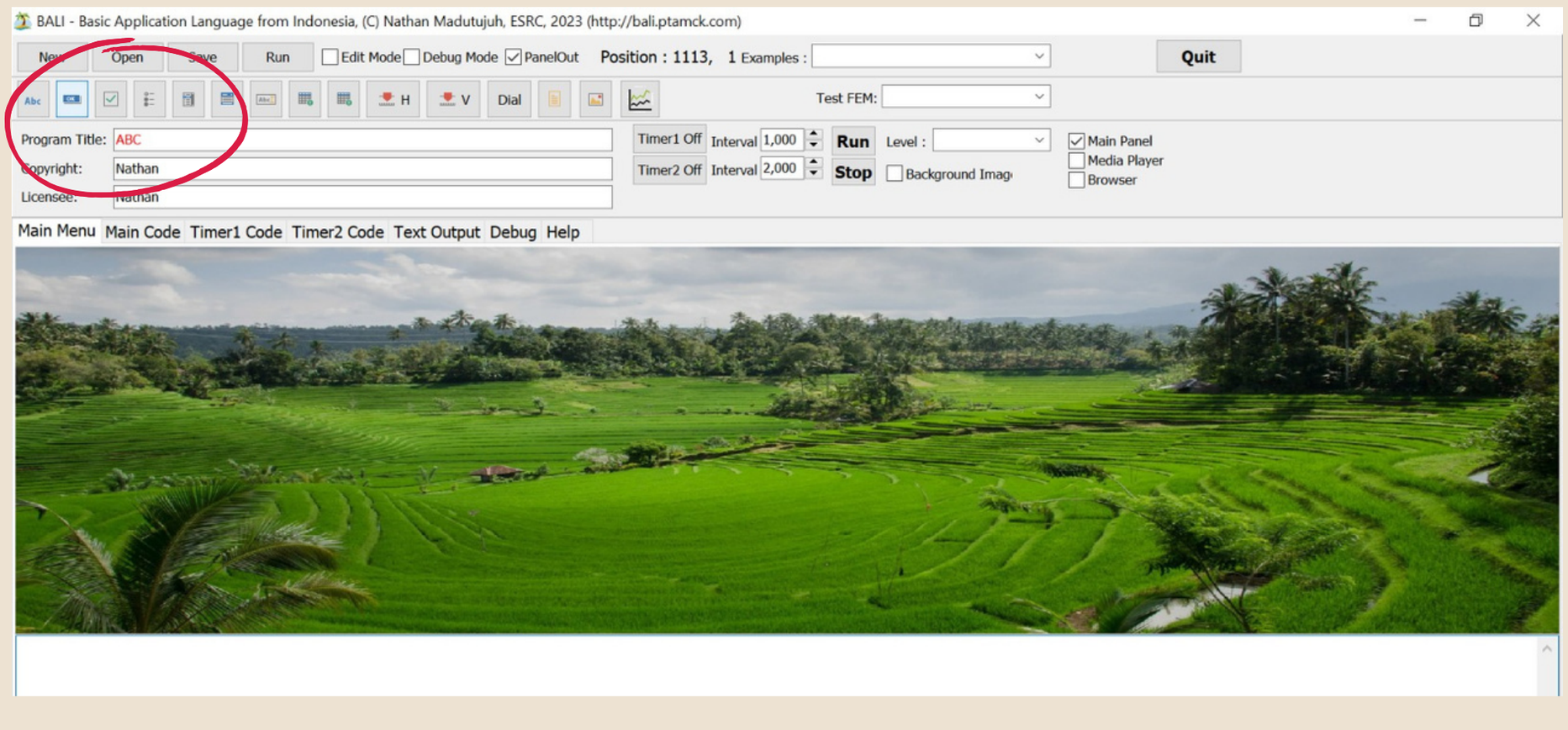


#Tutorial 6

"Simple Piano"

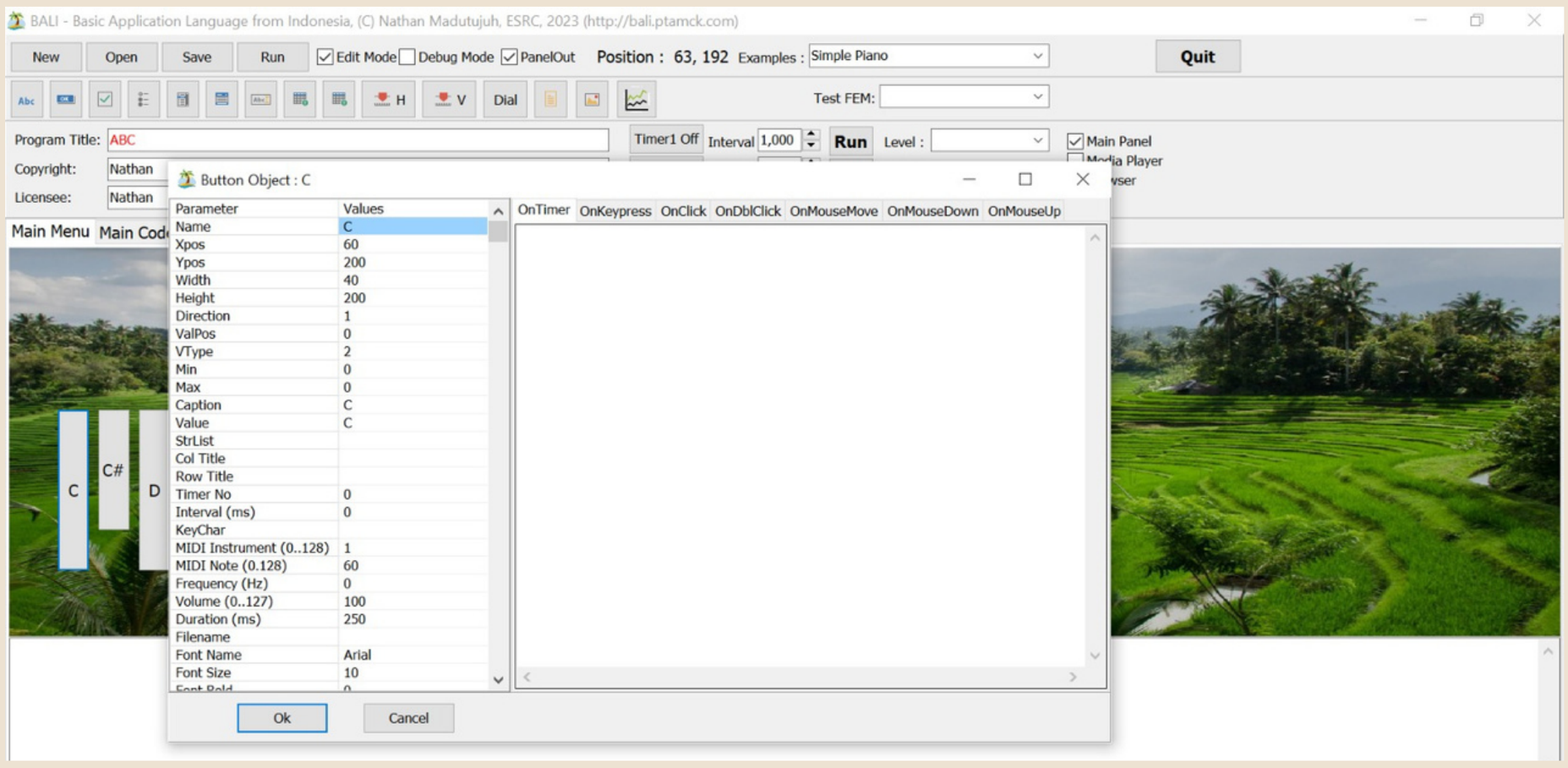
Step 1

Open programme and click MAIN MENU, insert EDIT BUTTON and click anywhere to place it!



Step 2

Change the edit button settings into default:



*Create your desired range of tones! This example uses 1 octave of tone range.

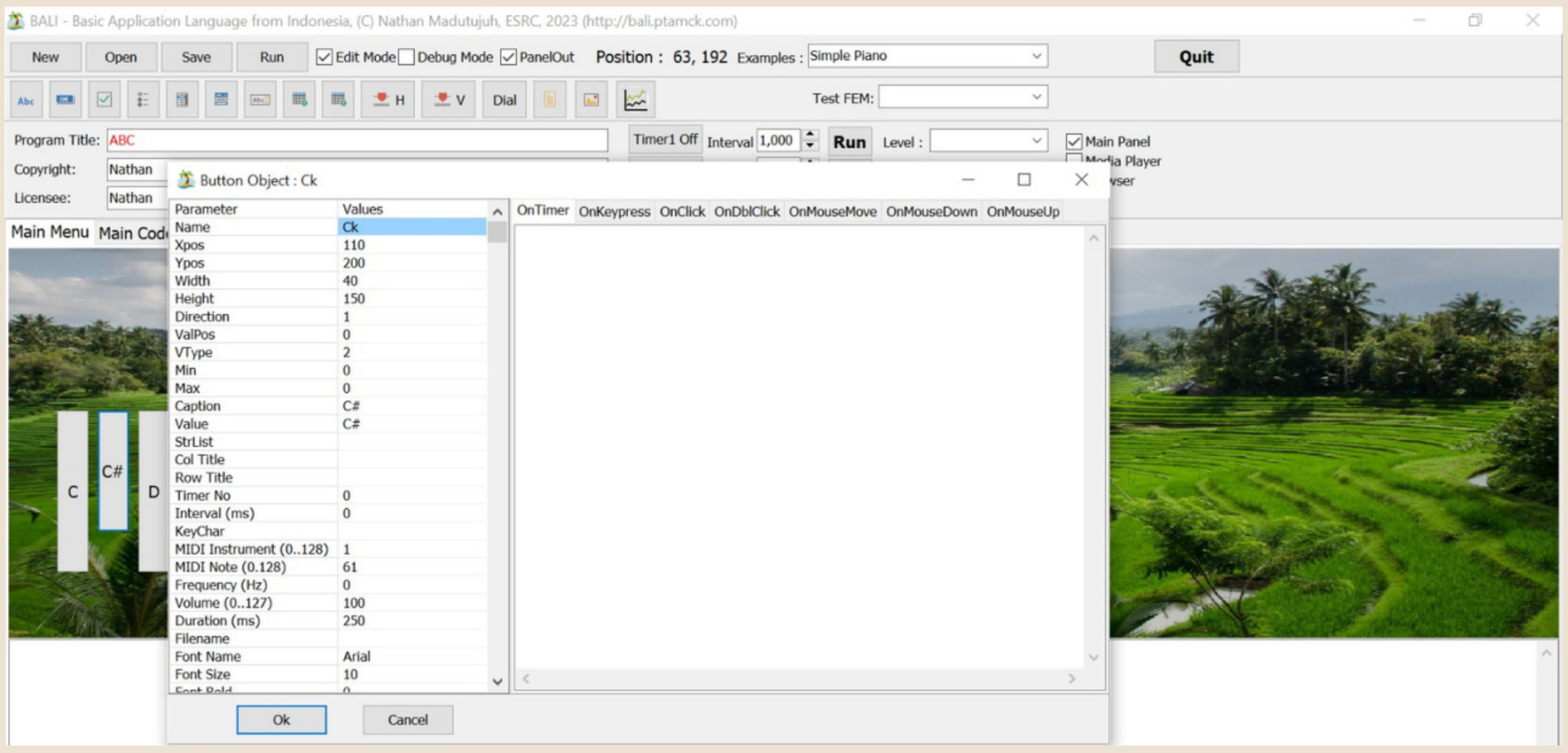
#Tutorial 6

"Simple Piano"

Step 3

Do the same thing for the next note!

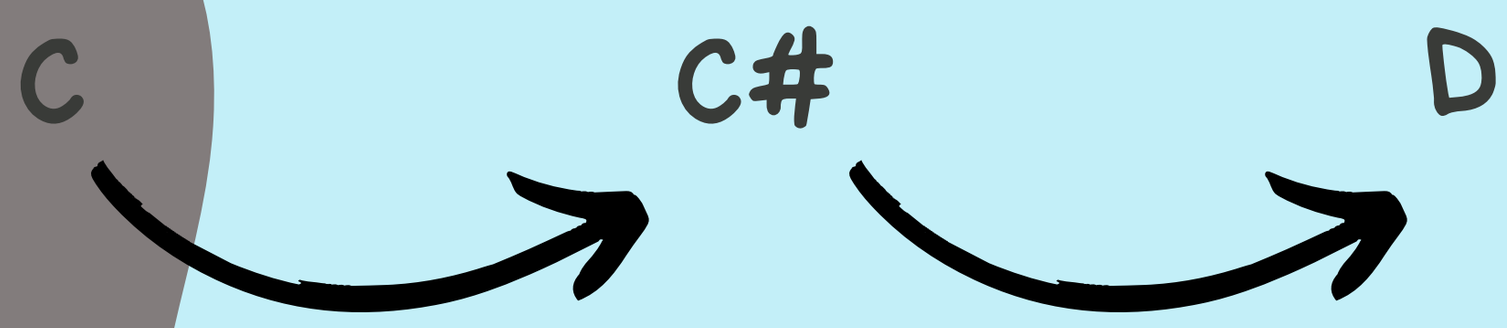
*this is an example of C#



PAY ATTENTION TO THE PATTERN!

The pitch increase will be followed by a MIDI NOTE increase.

For example, if you want to step up from C to D, the MIDI NOTE will defer by 2 numbers because the order they have to go through is :



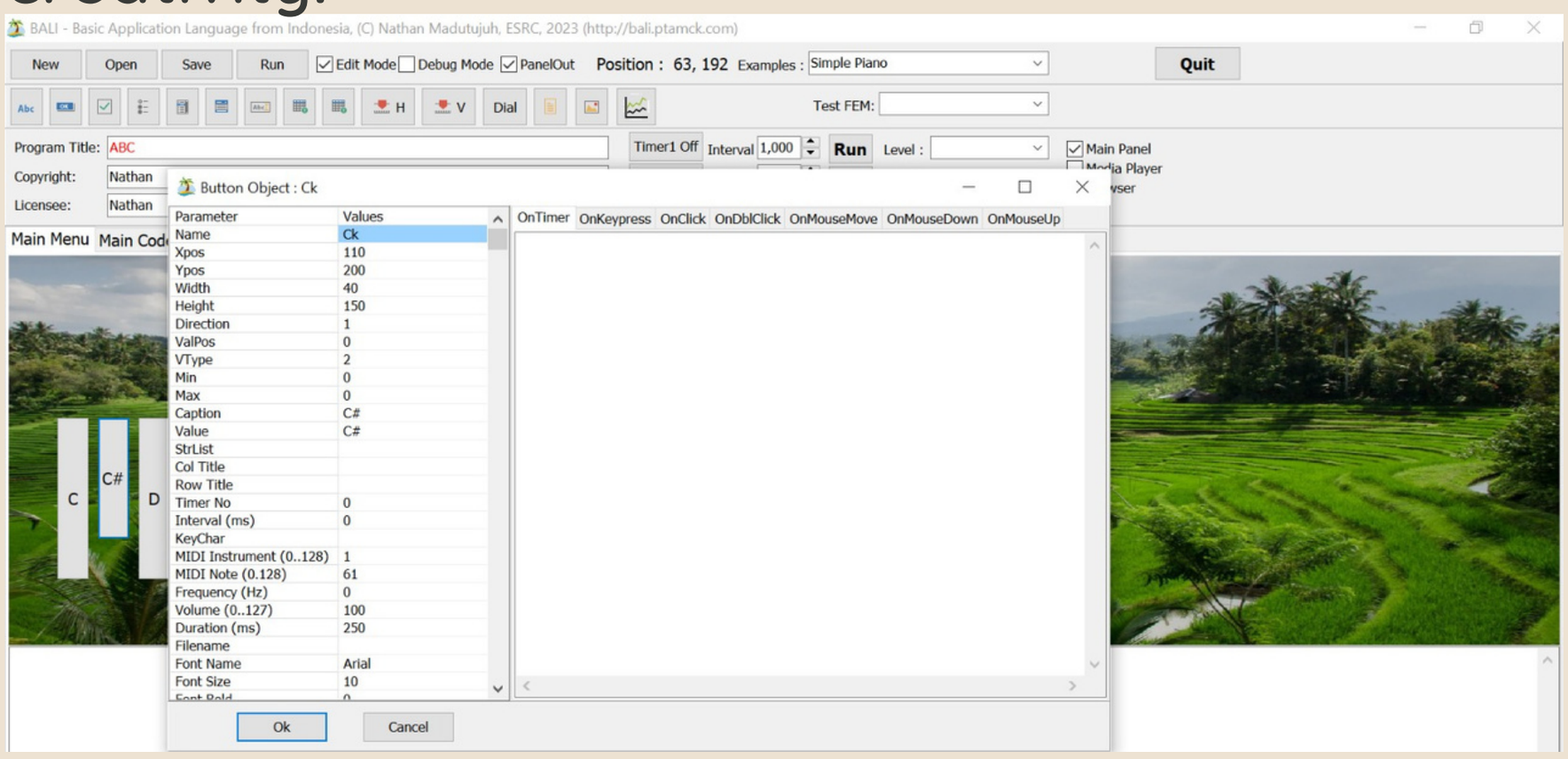
#Tutorial 6

"Simple Piano"

Step 4

Do the same thing for the next note!

*You can modify the size and position according to your creativity!



NOTE

Direction : Used for slider object types (objects that can be moved/dragged.
1 = being able to move horizontally
2 = being able to move vertically

Val Pos : Defined as the value of the object. Consist of String Value and Numeric Value.

VType : Defined as the Object Variable Type.
1 = String Chars
2 = Integers
3 = Decimal Numeric
4 = Logical
5 = Date
6 = Time
7 = Color

Min and Max : Minimum and Maximum value for Val.

#Tutorial 6

"Simple Piano"

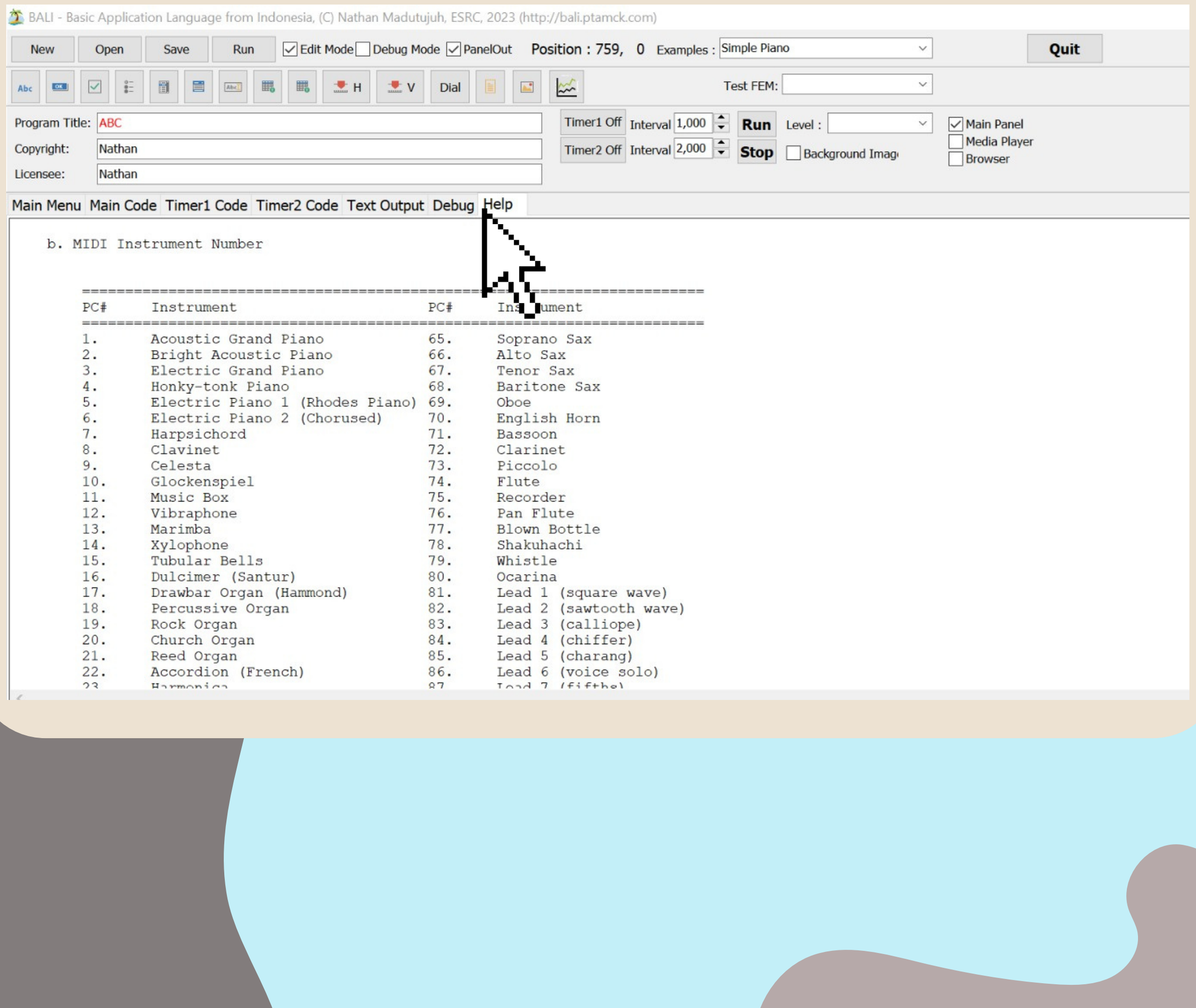
dictionary

MIDI INSTRUMENT : Shows the type of instrument sound you want to produce. 1 is the pointer for the piano instrument

MIDI NOTE : The pitch/ notes you want to produce. Usually starts with C and ends with C1, number 60 indicates C and so on as the number increases.

Duration : For how long the sound will last if we click the button.

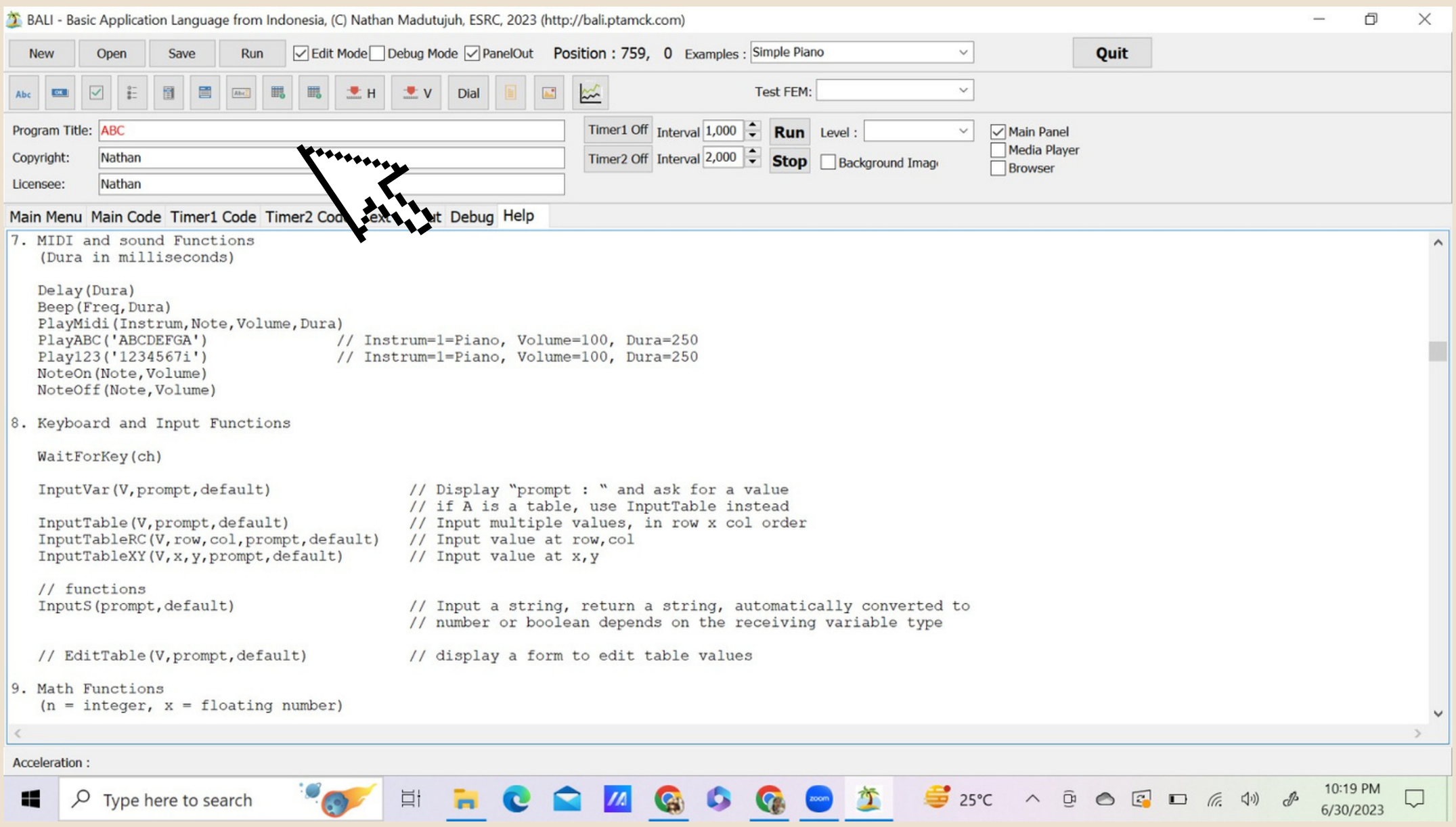
See Full Guide on HELP!



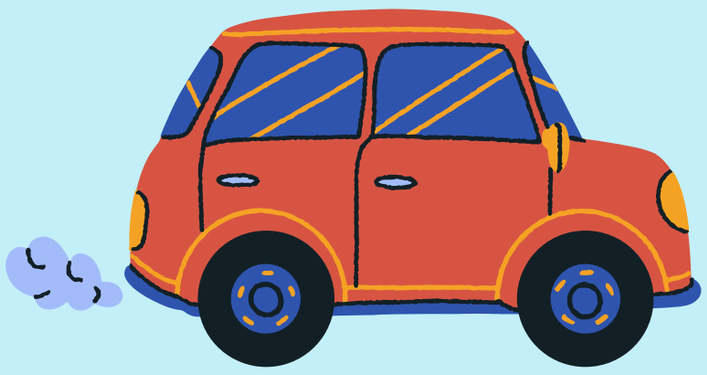
#Tutorial 6

"Simple Piano"

Try making another one using other functions!



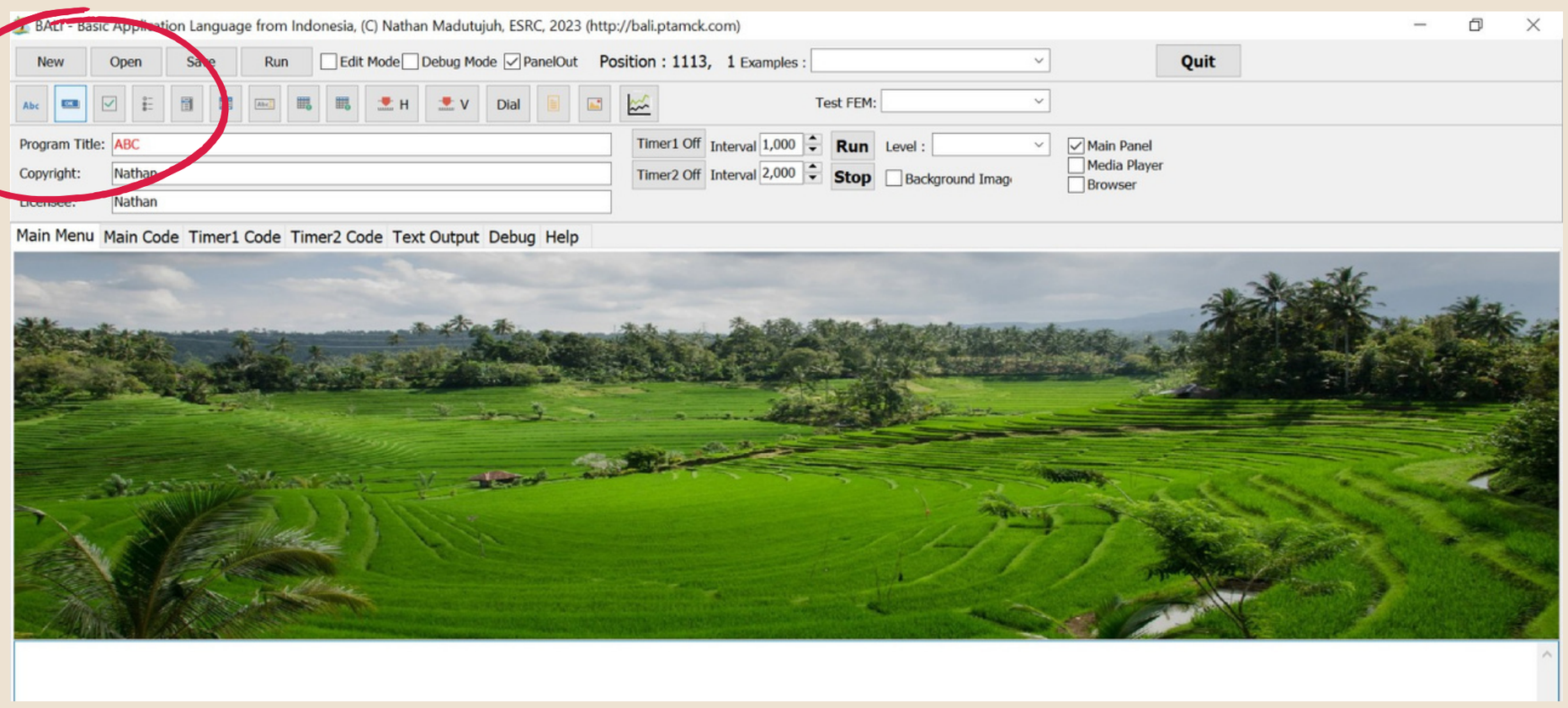
#Tutorial 7



"Moving Car"

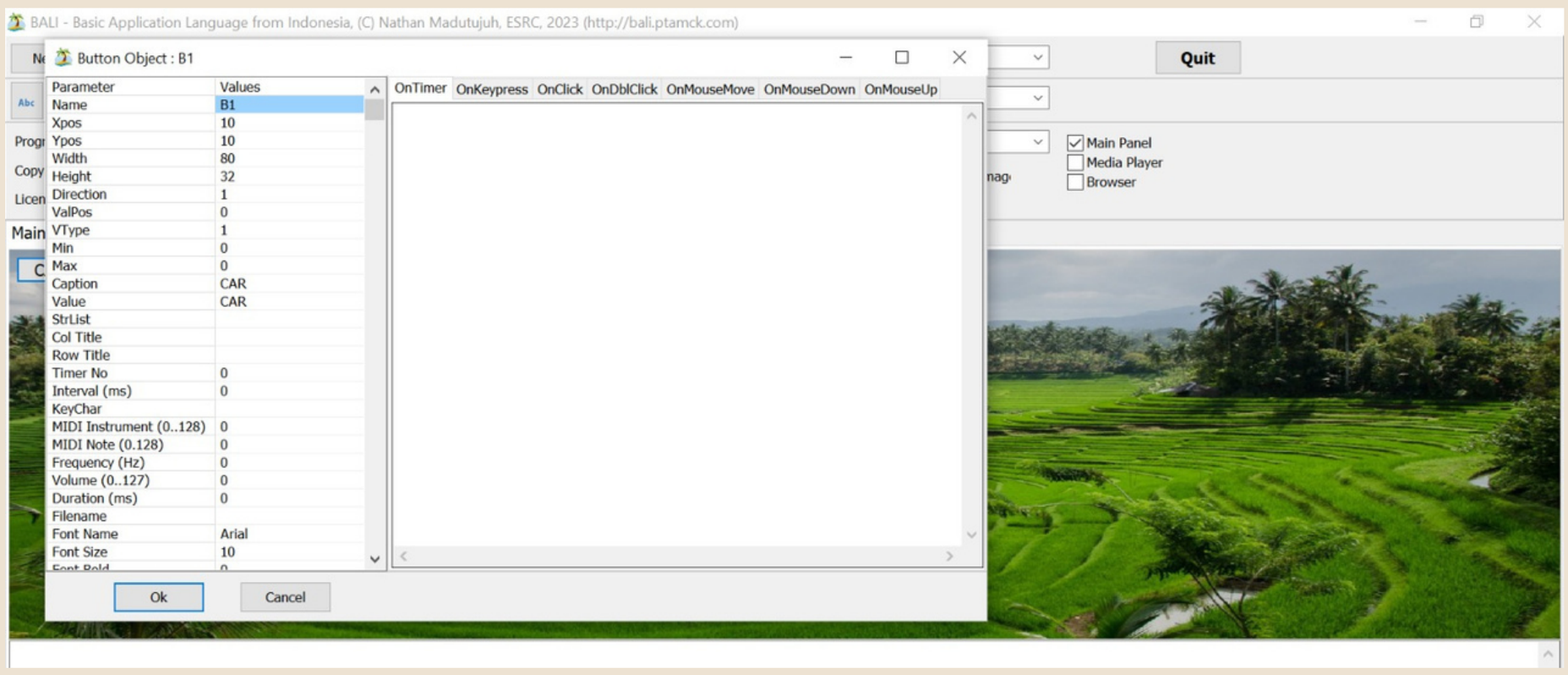
Step 1

Open programme and click MAIN MENU, insert EDIT BUTTON !

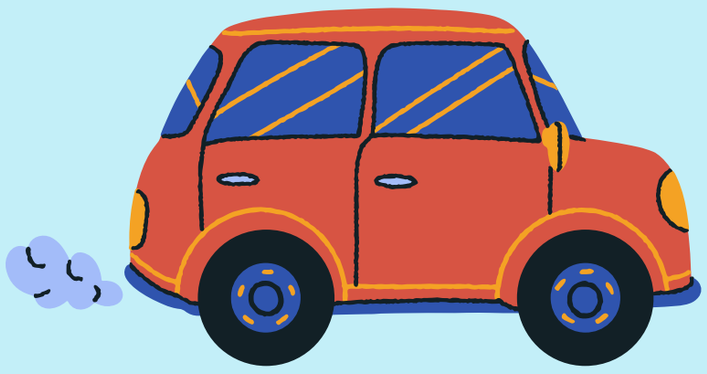


Step 2

Change the X position into 10, Width= 80, and Height= 32, name the button as CAR by changing the Text and Value



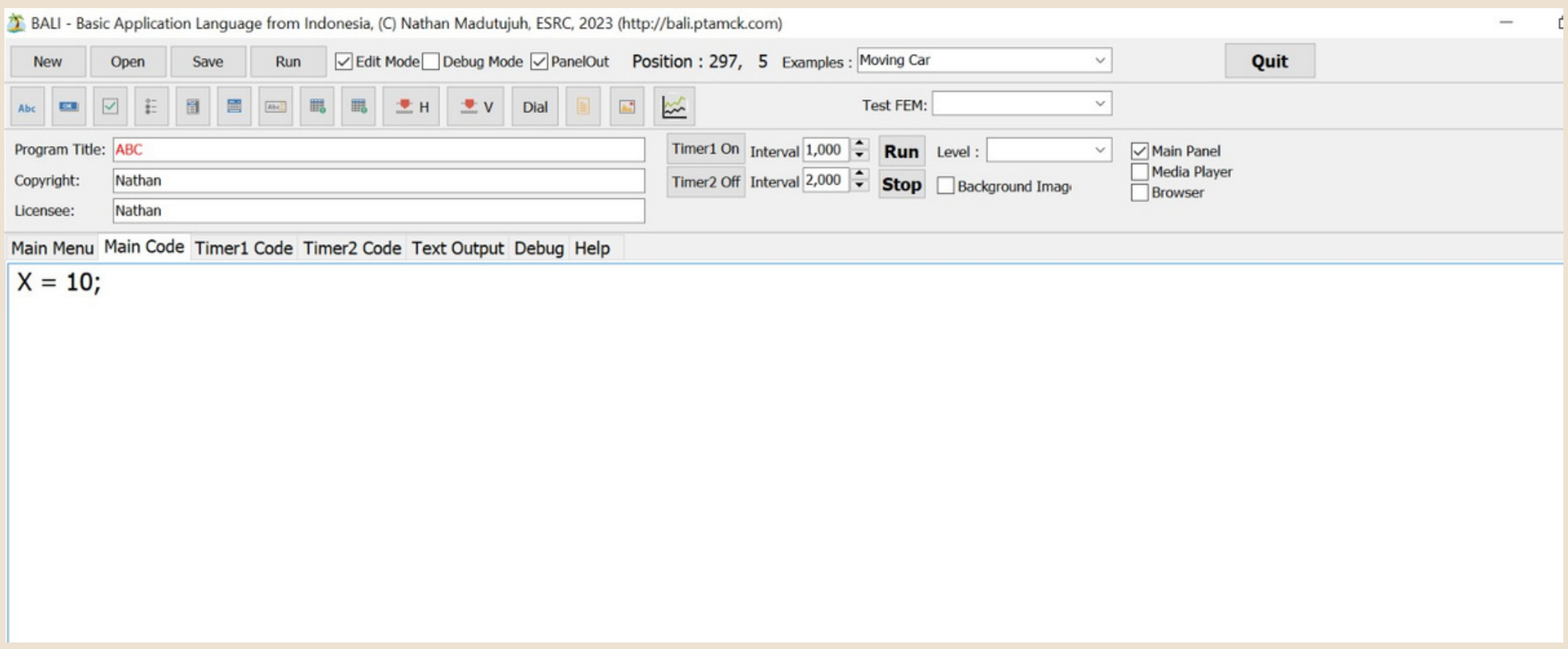
#Tutorial 7



"Moving Car"

Step 3

Open the MAIN CODE page and type variable X. X indicates the left position (X POS) of the button. Define its value! (X = 10;)

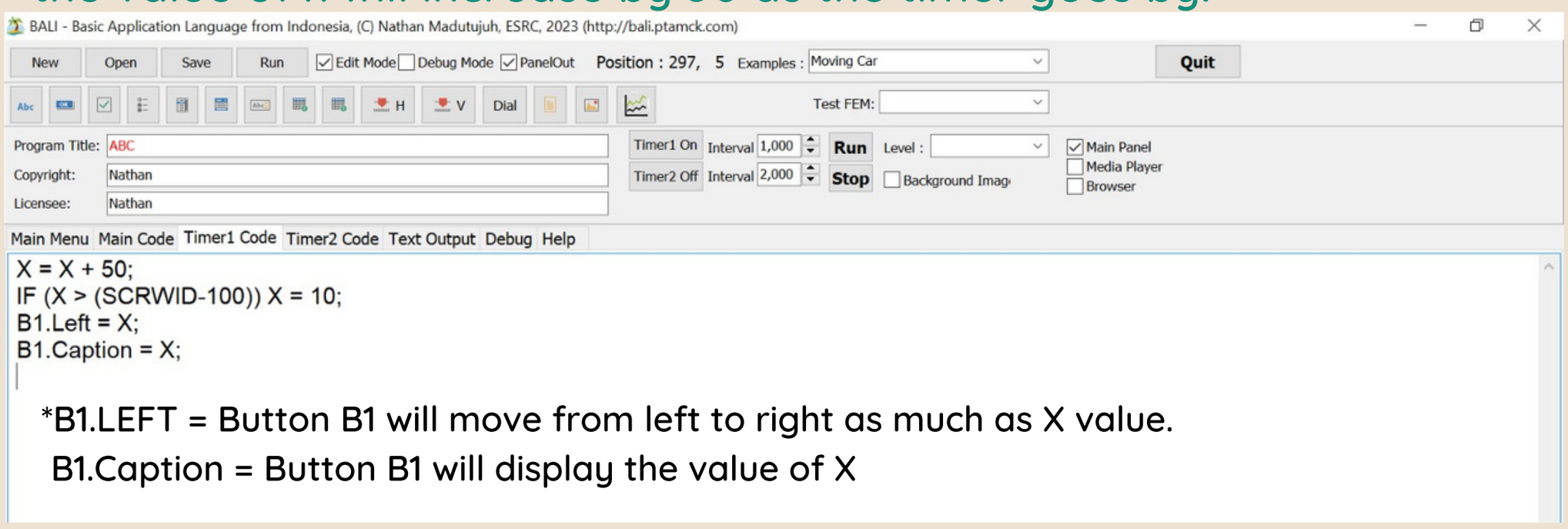


Step 4

Click TIMER1 CODE!

Define a new value of X, which is X = X + 50

*the value of x will increase by 50 as the timer goes by.

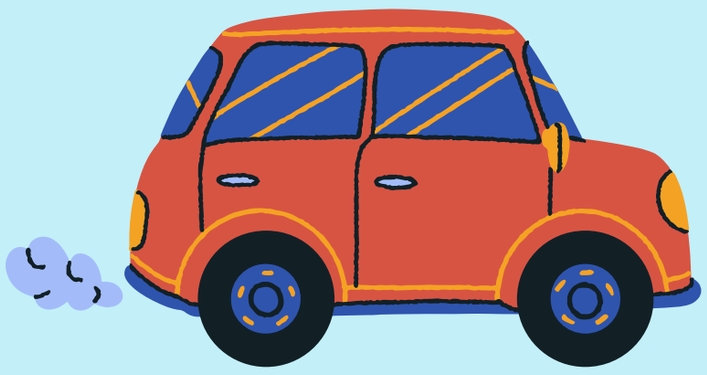


Enter IF formula!

IF (X > (SCRWID-100)) X = 10;

*if the x position has reached the screen width minus 100, then X will return to its original position, which is 10

#Tutorial 7

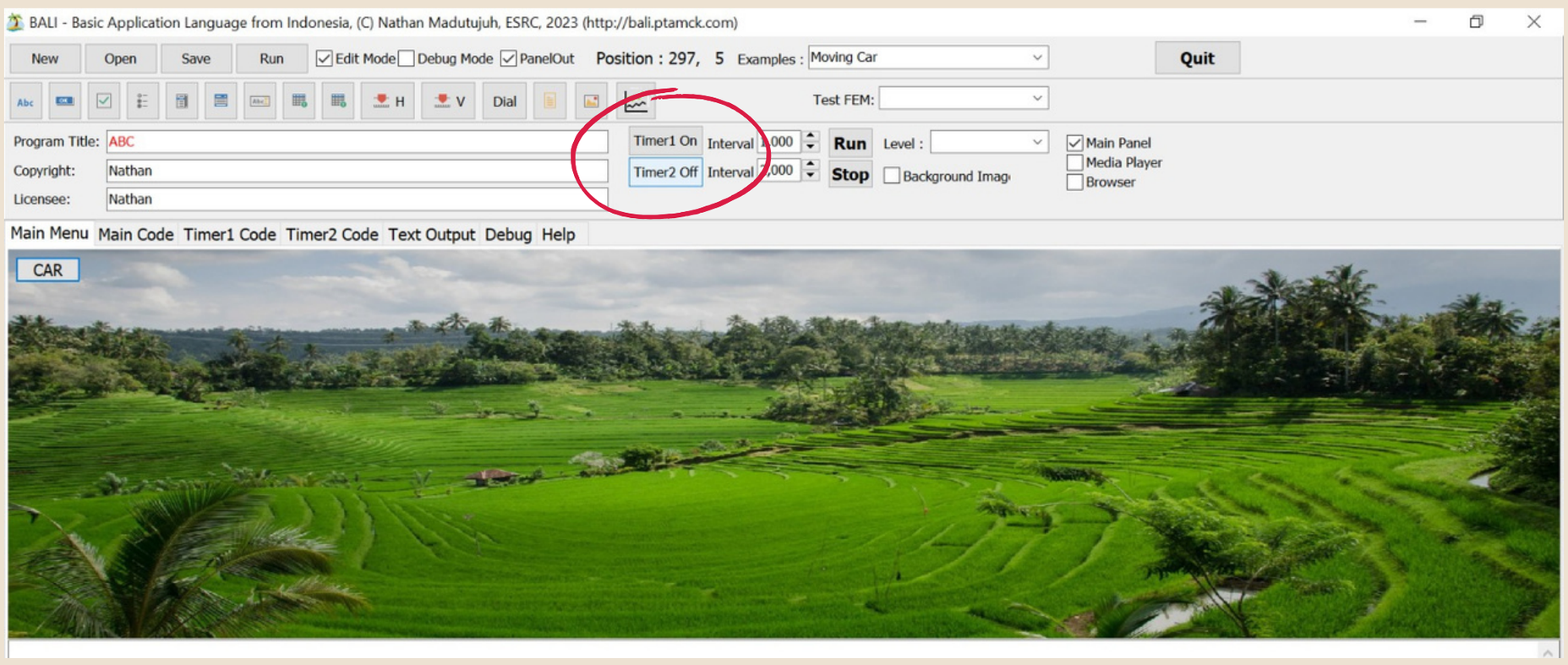


"Moving Car"

Step 5

Click RUN

and set the Timer1 ON! The car will move from left to right!



NOTE

SCRWID = Screen Width
SCRHGT = Screen Height
NAME.Left = Button moving horizontally
NAME.Top = Button moving vertically

Try Making An Arcade Game Using Timer and different functions!

Be Creative and

Good Luck!