

# CHAPTER 1

Visual Logic

# Computer Program

- Solution to a problem.
  - How can my customer purchase products from the Internet?
- Most do 3 things
  - Input data
  - Process data
  - Output data



# Writing a Computer Program

- Determining what the problem is
  - Creating a logical solution to solve a problem
  - Implementing that solution
  - Verify the solution is correct
- 
- Everyday examples of algorithms
    - ▣ Directions to bake a cake
    - ▣ Direction for game

# Difference Between Data and Information



- 500
  - ▣ Data is numbers, character, and/or images without context
- Order 500 t-shirts
  - ▣ Information is data that has been processed

# Logic and Syntax

- Compare building software application to a house.
  - ▣ What are the requirements
  - ▣ Design
  - ▣ Construct
  - ▣ Check
- Algorithm – logical blueprint for software
- Visual Logic
  - ▣ Graphics of flowcharts (graphical representation of algorithm)
  - ▣ Utility of pseudo code ( min. syntax description of algorithm)

# Errors

6

## □ Two Kinds

### □ Syntax

- Violate the rules of the language
- More difficult to do with Visual Logic than Java
- Begin with the easy more to more difficult

### □ Logic

- Violate the rules of the problem
- Your thinking is off
- You can do this anytime



First Program

Hello World

# Flowchart Symbols

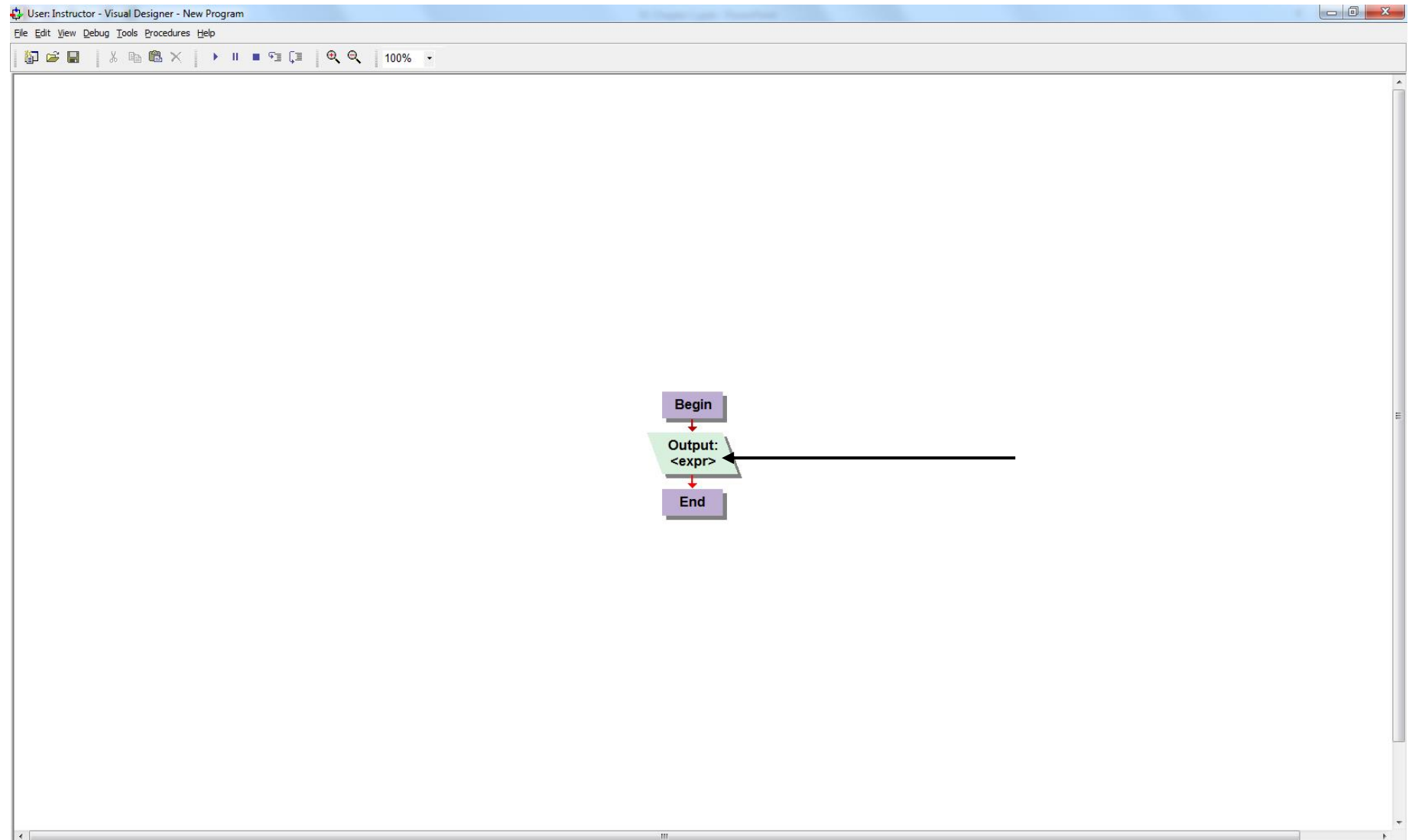
	Input
	Assignment
	Output
	If Condition
	For Loop
	While Loop
	Exit Loop
	Make Array
	Graphics ▶
	Call Procedure ▶
	Play Multimedia
	Paste      Ctrl+V

Be

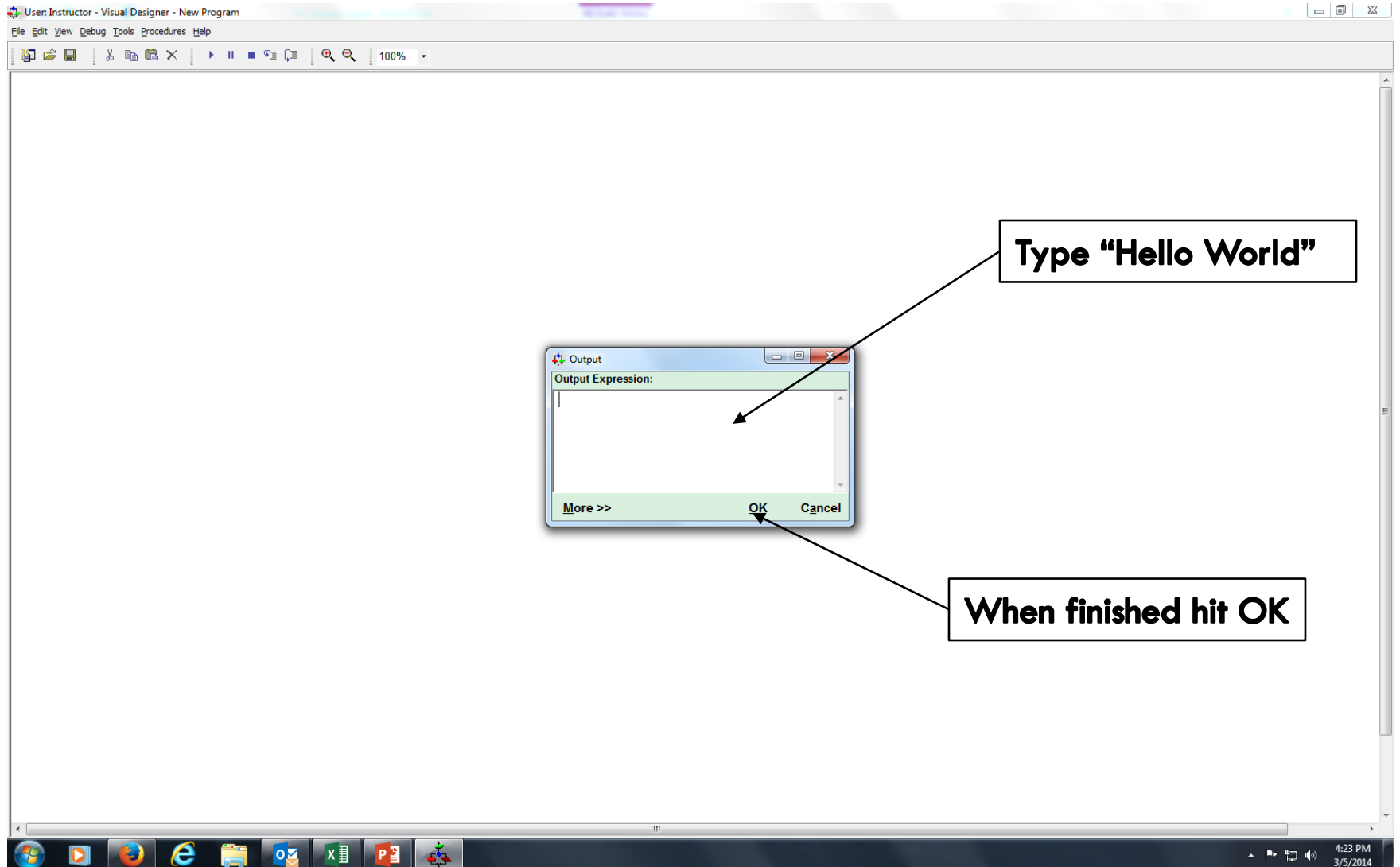
End



# Creating Hello World



# Next Step



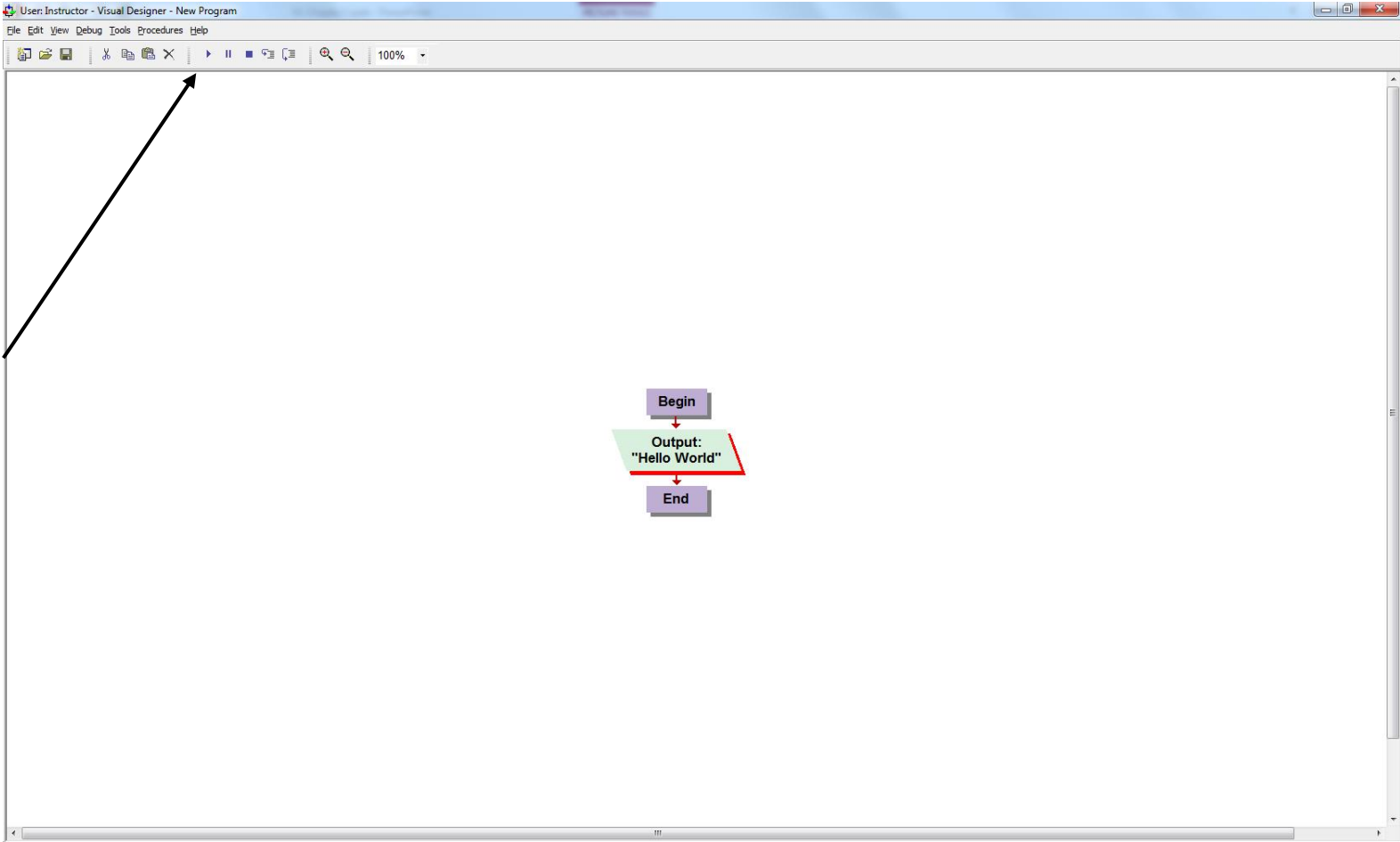
The image shows a screenshot of the Visual Studio IDE. The main window is titled "User: Instructor - Visual Designer - New Program" and contains a large empty white area. A smaller "Output" dialog box is open in the center, with the title "Output" and a sub-label "Output Expression:". The dialog box has a text input field, a "More >>" button, and "OK" and "Cancel" buttons. Two callout boxes with arrows point to the dialog box: one pointing to the text input field and another pointing to the "OK" button.

**Type "Hello World"**

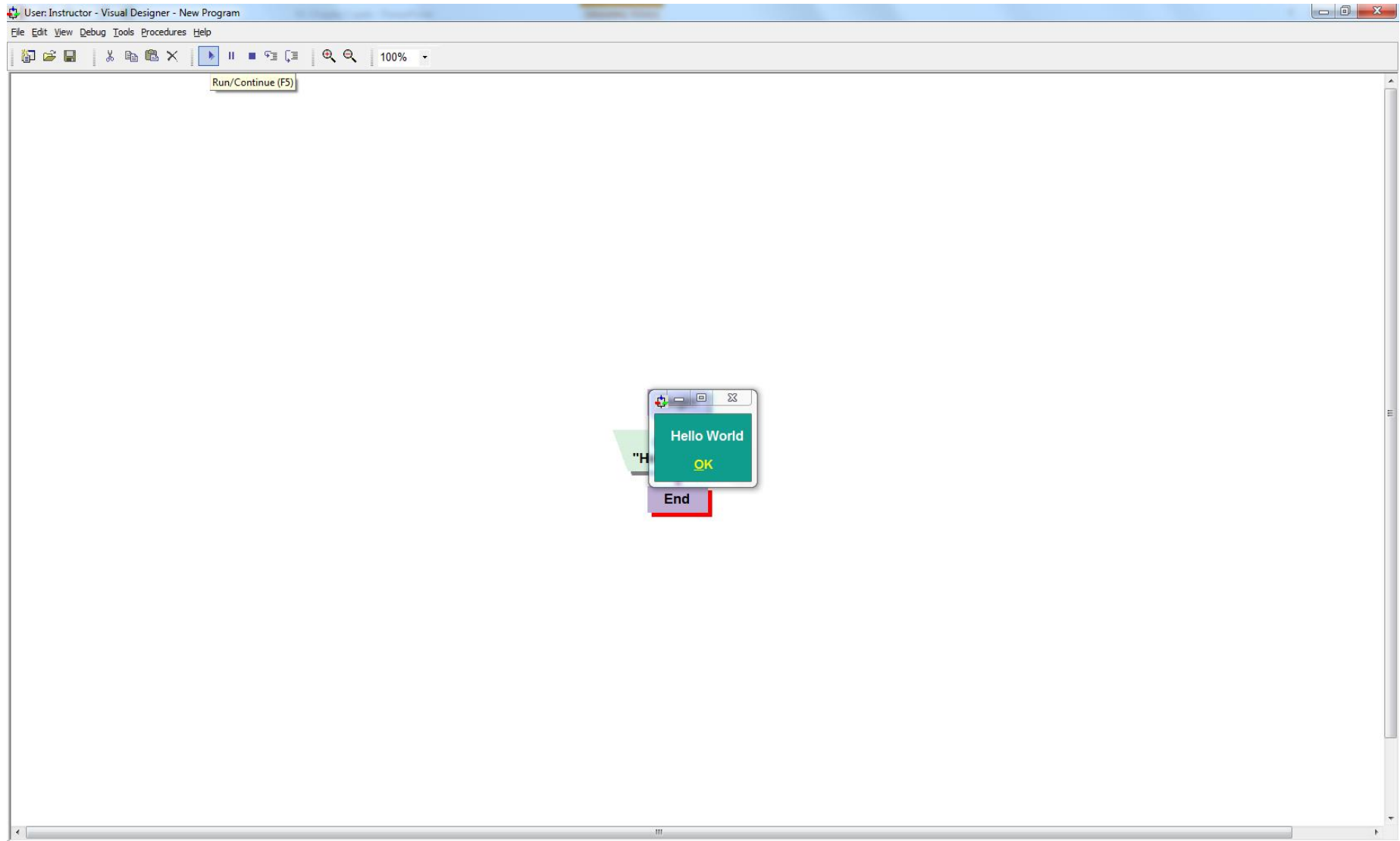
**When finished hit OK**

At the bottom of the screen, the Windows taskbar is visible, showing icons for Internet Explorer, Outlook, Excel, PowerPoint, and Visual Studio. The system tray in the bottom right corner shows the time as 4:23 PM on 3/5/2014.

# Almost There



# You Did It

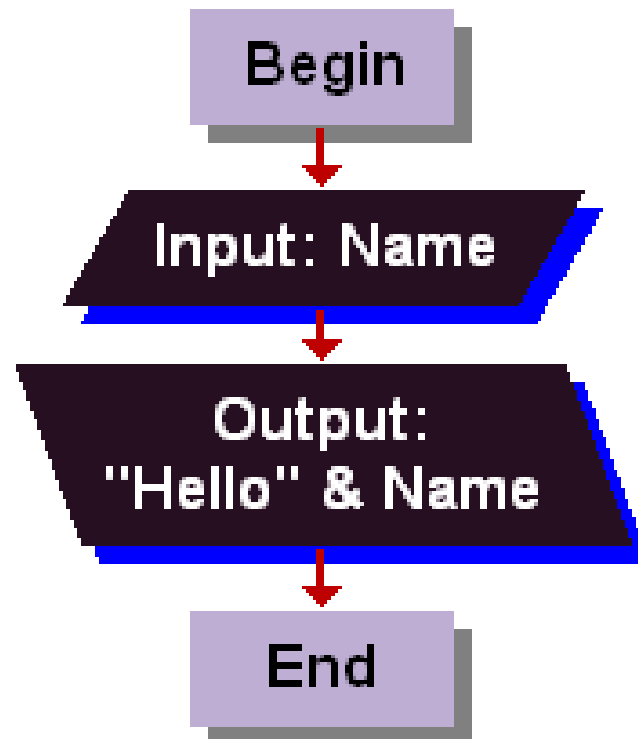


# Input

- Input Statement
  - ▣ Accepts data and stores into a variable
- Variable
  - ▣ Storage location
  - ▣ Can be accessed and changed by developer code
  - ▣ Has a name and a value

## Second Program

# Hello Name



# Program Formats

Value	Written Format	Programming Format	Comment
String	Hello World	"Hello World"	Use quotes to delimit strings
Percent	15%	0.15	Use decimal format
Dollars	\$300	300	Dollar signs not allowed
Large numbers	12,345,678	12345678	Commas not allowed





# Weekly Paycheck Program

# Weekly Paycheck Program Specifics

- Accepts the hours worked
- Accepts the hourly rate for an employee
- Will calculate and display the appropriate pay amount due
  
- Step 1: Input What is the input needed
  - ▣ Hours and Rate
- Step 2: Processing What calculation must be performed
  - ▣  $\text{Hours} * \text{Rate}$
- Step 3: Output

# Expressions

- A value-returning code element
- $X = A + B$
- Assignment statements are use to perform calculations and store the results
- Expression is evaluated and stored in a variable

# Operator Precedence

Operation	Operator	Expression 1	Result 1	Expression 2	Result 2
Exponentiation	$\wedge$	$5 \wedge 2 + 1$	26	$5 \wedge (2 + 1)$	125
Multiplication	*	$1 + 3 * 7$	22	$(1 + 3) * 7$	28
Division	/	$8 + 4 / 2$	10	$(8 + 4) / 2$	6
Integer division	\	$12 \setminus 4$	3	$17 \setminus 3$	5
Integer remainder	Mod	$12 \text{ Mod } 4$	0	$17 \text{ Mod } 3$	2
Addition and subtraction	+ -	$4 - 5 + 2$	1	$4 - (5 + 2)$	-3

Java will handle exponentiation and division differently

# Weekly Paycheck Program



# Intrinsic Functions

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- Predefined commands that provide developers with common, helpful functionality

# Function for Visual Logic

Example	Result
FormatCurrency(12345)	\$12,345.00
FormatCurrency(.02)	\$0.02
FormatPercent(0.0625)	6.25%
FormatPercent(0.75)	75.00%
Abs(-3.3)	3.3
Abs(5.67)	5.67
Int(3.8)	3
Round(3.8)	4
Random(5)	A random integer between 0 and 4
Random(100) + 1	A random integer between 1 and 100

Java handles these differently

# Rose by Any Other Name

- Paulette has just planted a large rose garden that she wants to fertilize. She knows the area of her rose garden in square feet, but the fertilizer is measured by the square yard. Write a program that converts square feet to square yards.