

ClassPad 101

for ClassPad Version 3.00+

LESSON 15

Introduction to Programming

Welcome

There are many different types of programming languages. Each programming language has its own syntax or style for entering instructions. To program in a particular language you must learn the syntax of the language. In any programming language, we are writing instructions for the computer or device to follow. Programming is logical and fun!

Lesson Goals

- To gain a general understanding of programming
- To write a simple program showing output
- To write a simple program asking for input
- To write a program that averages three numbers

In Lesson 15, you will learn how to:

- Write a program to display output
- Write a program to accept input
- Use an If Then statement

Upon completion of this lesson, you will be able to answer the following questions:

1. What command do you use to display text?
2. What command do we use to clear the display window?
3. What command would you type to place the words "You won!" at position 10, 50 in the display window?
4. If Then statements must end with what command?
5. What is a walk through in the programming world?

Time required

About 60 minutes.

Getting Started

We will begin this lesson by creating a simple program. Once you learn how to find commands and understand the ClassPad's syntax (style) you will be able to create interesting programs.

When we write a program, the text we type in is called **code**. When we run a program, our code is followed exactly. In our programs, we are telling the ClassPad exactly what to do and the ClassPad will do exactly what we tell it to do. This is why entering text in the correct format is so important.

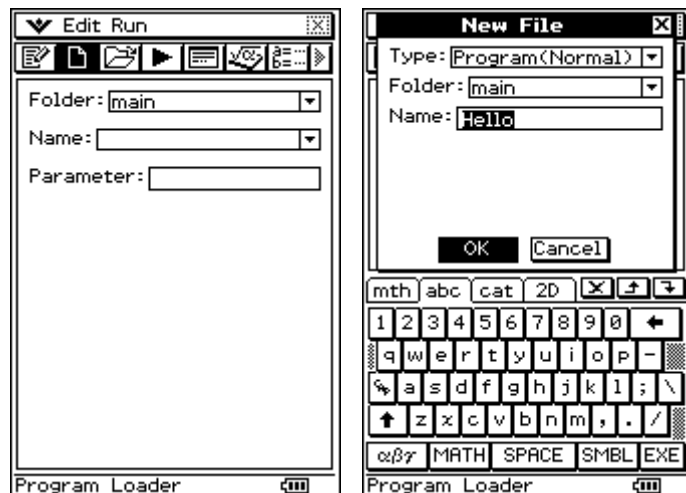
If you are interested in learning more about a particular command, please try searching the ClassPad's User Manual.

PART I

In this part, we will create a simple program.

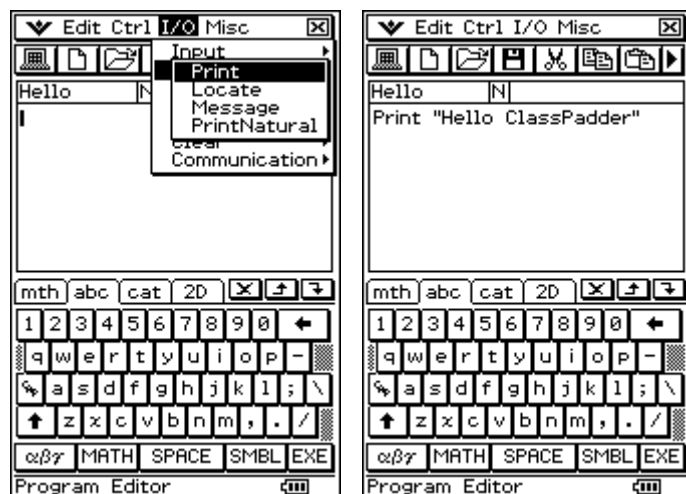
1. Naming a Program

- Click **m** and then **p**
- Click the **O** button
- Type in the name: **Hello**
- Click **OK**
- The Program Editor window opens. This is where we input the code for a program.






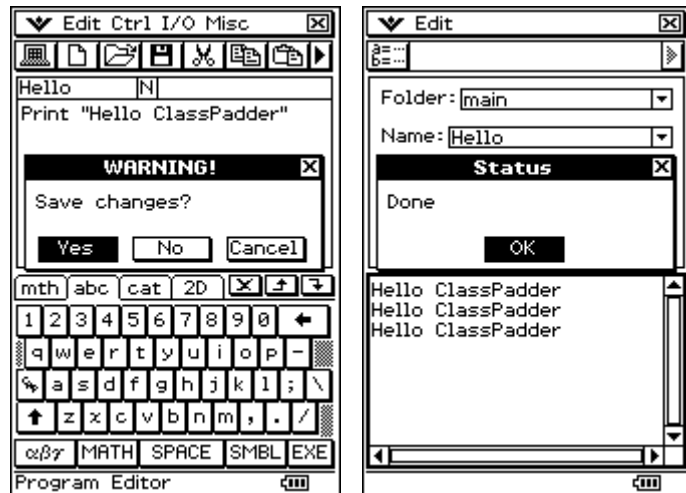
2. Entering Code to Display a Message

- Open the **I/O** menu and select **Output/Print**
- NOTICE** Print was input with a space following it. The space is part of the Print command's syntax and is needed.
- Type in **"Hello ClassPadder"** and press **EXE**
- The quotes are needed to let the ClassPad know that Hello ClassPadder is a word, not a variable





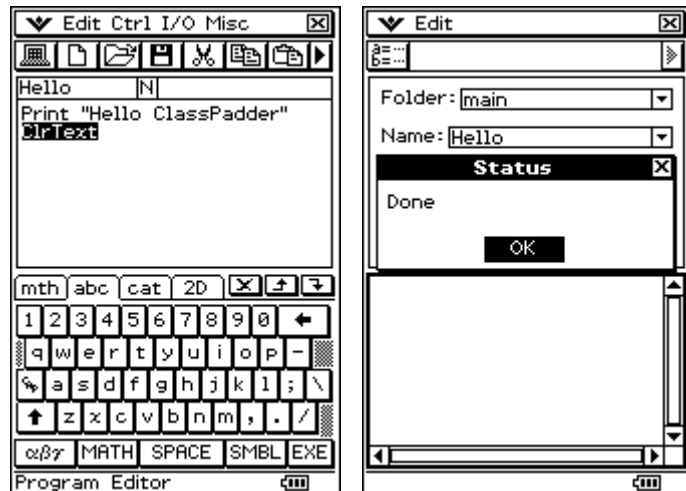
3. Running a Program

- Click the  button
- Click **Yes** to save your changes
- Click  to run your program
- Click **OK**
- Click in the **upper window**
- Click  to run your program again (*Our 1st Hello still shows!*)
- Click **OK**
- Run Hello** a few more times



4. Editing a Program

- Click in the **upper window**
- Select **P** to return to the **Program Editor**
- Click (place focus) below the **Print** line
- Input **ClrText**
*You can **type it in** or select **I/O /Clear/ClrText**
- Run the program again**
*Click , **Yes** and then 
- Well, what happened?





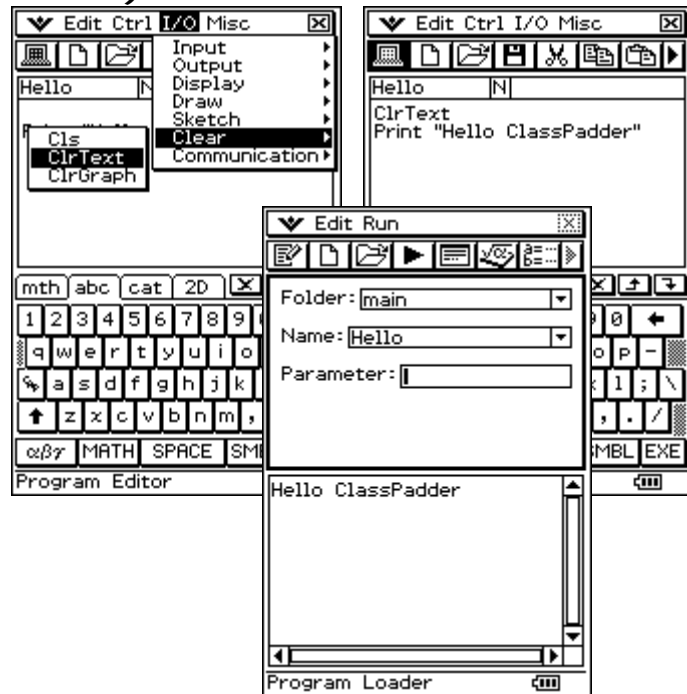
Our program did exactly what we told it to do!

First it printed Hello ClassPadder and **then** it cleared the window.

But, we would like it to first clear the window and then print Hello ClassPadder. Hmmmm...


5. Editing a Program (Continued)

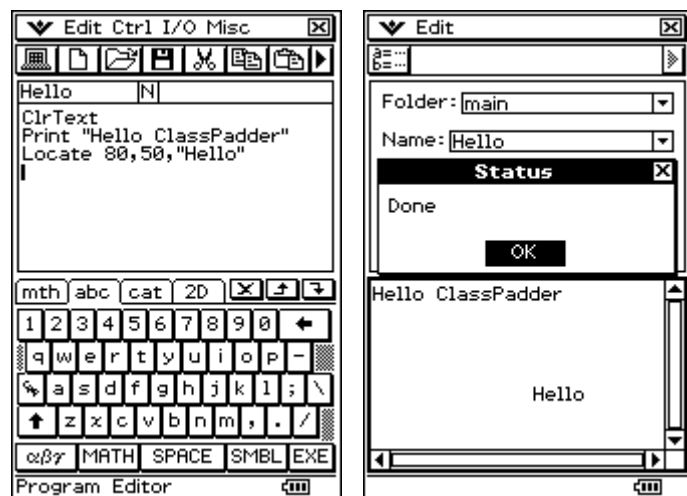
- Click in the **upper window** and select P
- Delete ClrText**
- Put an empty line **above** Print "Hello ClassPadder"
- Click in the empty line
- Type in **ClrText** or select **I/O /Clear/ClrText**
- Click the **)** button
- Click **Yes**
- Click  to run your program and click **OK**
- Click in the **upper window**
- Click  to run your program again (Only one Hello ClassPadder!)







6. Using the Locate command to Print

The Locate command lets us place output at a specific (x,y) location on the screen. For example, **Locate 10, 20, "abc"** places abc over 10 and down 20 from the upper left corner. We can go as high as 290 for each location (horizontal and vertical).

- Let's try to print "Hello" near the center of the display window!
- Open the program editor (select P)
- Place the cursor **below** the **Print** line
- Open the **I/O** menu and select **Output/Locate**
- Notice a space following Locate (This is part of the syntax!)
- Following Locate, type in **80, 50, "Hello"**
- Click **)** and **Yes**
- Click  to run your program and click **OK**
- Not quite centered; try changing the location and run again




Button Review

- Click  to create a new program.
- Click  to return to the program editor and edit a window.
- Click  to save changes and exit the program editor.
- Click  to run a program.

PART I

Practice Exercises

Before beginning the practice exercises, open a word document, type in the following information and then *save it as Lesson15 in your CASIO folder within My Documents*:

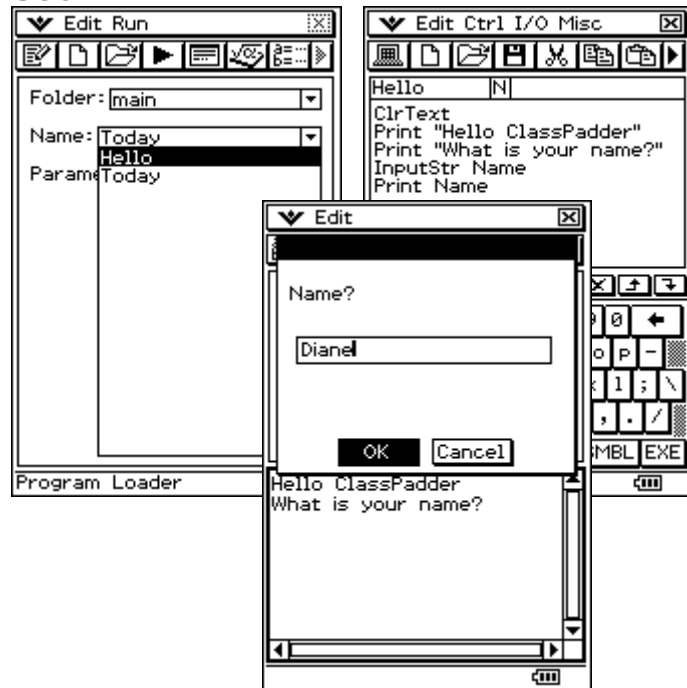
- Date: (enter today's date)
 - To: (put your instructor's name here)
 - From: (put your name here)
 - Re: Lesson 15
1. Begin a new program named **Today** by clicking  and inputting the program name.
 2. Input code to display the word **Today** in the upper left corner of the display window. Remember to input the line of code needed to first clear the window.
 3. Run your program. With **Today** displaying in the output window, get a **screen capture**. Paste it into your Lesson15 document (under a title of PART I).
 4. Add a line of code to display **is Tuesday** (or whatever day of the week it is for you) on the next output line to be displayed.
 5. Run your program. With your new output showing, get a **screen capture**. Add two blank spaces following the first screen capture and then paste this one.
 6. Add a line of code to display **Today is Tuesday** (or some other day name) so that it is centered in the output window. Try to center it, but it does not have to be perfect!
 7. Once you are happy with your centering, get a **screen capture** of your output window. Add two blank spaces following the second screen capture and then paste this one.

PART II

In this part, we will ask the user for input and then display a message using their input.

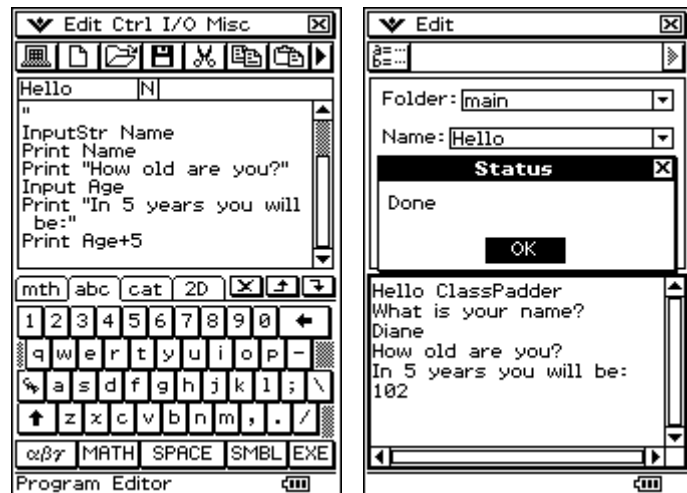
1. Getting Input from the User

- Open your **Hello** program again
- Select **P** to edit the program
- Delete** the line containing **Locate**
- Select **I/O** and then **Output/Print**
- Type in **"What is your name?"** and press **EXE**
- Select **I/O** and then **Input/InputStr**
- Type in **Name** and press **EXE**
- Type in **Print Name** and press **EXE**
- Run your program



2. More Input from User

- Return to the **Program Editor**
- Type in **Print "How old are you?"** and press **EXE**
- Type in **Input Age** and press **EXE**
- Type in **Print "In 5 years you will be:"** and press **EXE**
- Type in **Print Age+5** and press **EXE**
- Run your program

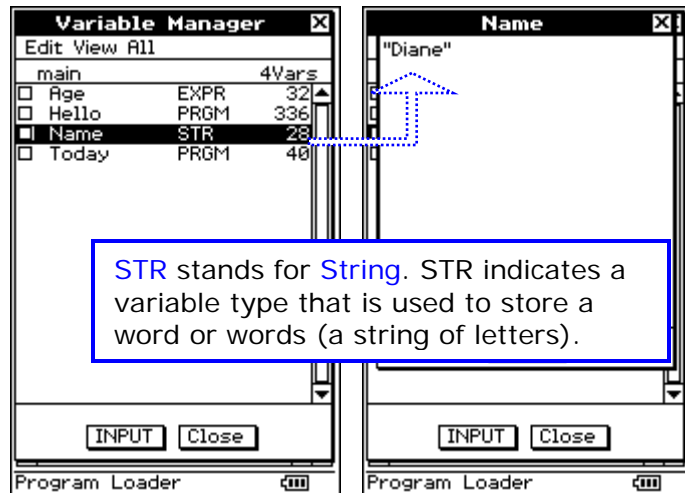


What is the difference between *Input* and *InputStr*?

- InputStr** treats what we input as a **string**. In programming we call text **strings** (text is made up of a string of characters).
- Input** treats what we input as a value that we can perform calculations on.

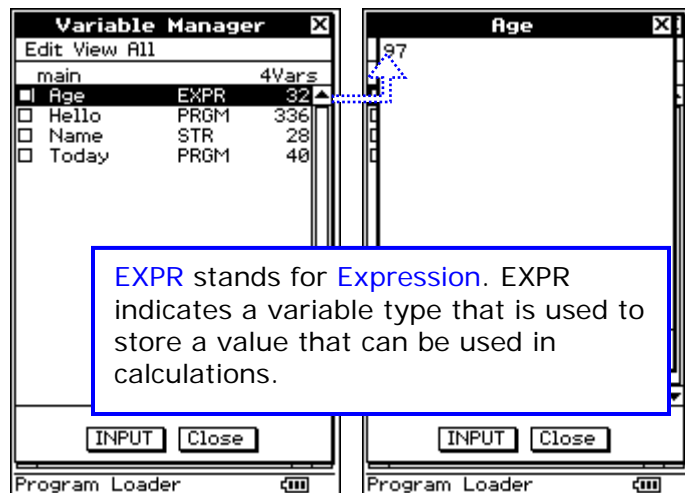
3. Viewing a Variable's Contents

- When we ran our program, values were stored in the variables **Name** and **Age**
- To view their contents select **o/ Variable Manager**
- Double click** on the **main** folder to open it
- Double click** on the variable **Name** to view its contents
- Notice** the variable **Name** is of type **STR**



4. Viewing a Variable's Contents (Continued)

- Next, **double click** on the variable **Age**
- I am so old!
- Notice** the variable **Age** is of type **EXPR**
- Also, notice our programs are listed here
- Double click on one of your program names to see what happens ☺




How do we average numbers?

In the Part II practice exercises you will write a program to find the average of three grades. Remember, to find an average, we add the values and then divide by the number of values we added. For example, to average 80, 92 and 88 we find $(80+92+88)/3$.

In general, to average grades a, b and c we find $(a+b+c)/3$.

PART II

Practice Exercises

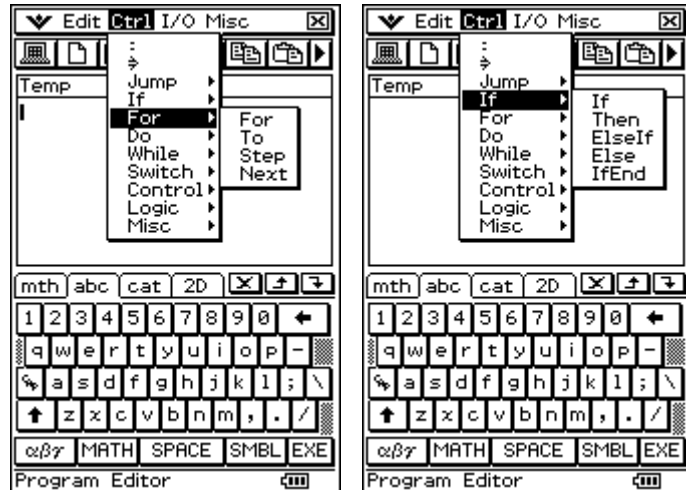
1. Begin a new program named **Average** by clicking  and inputting the program name.
2. Input code to display the message **Averaging Test Scores** in the upper left corner of the display window. Remember to input the line of code needed to first clear the window.
3. Run your program to make sure it works.
4. Ask the user to input their first test score by adding this line to your program: **Input a,"1st Test Score"**. This will store the user's first test score in the variable **a**.
5. Run your program to make sure it works. With the input dialog showing, get a **screen capture**. Paste it into your Lesson15 document (under a title of PART II).
6. Add two more lines of code to prompt the user for their 2nd and 3rd test scores. Store the 2nd test score in variable **b** and the 3rd in variable **c**. [Hint: select **Input a,"1st Test Score"**, copy it (Ctrl+c), paste it (Ctrl+v) twice and then change the **a** and **1st**.]
7. Run your program to make sure it works.
8. With your program showing, get a **screen capture**. Add two blank spaces following the first screen capture and then paste this one.
9. Now we need to average the user's test scores. Input code to display the message **Your test average is:**
10. Add code to display their average by typing in **Print (a+b+c)/3**.
11. Run your program and input **90**, **78** and **98** for the test scores.
12. Change **Print (a+b+c)/3** to **Print approx((a+b+c)/3)**.
13. Run your program again.
14. With the average showing, get a **screen capture** of your output window. Add two blank spaces following the second screen capture and then paste this one.

PART III

A very important part of writing programs is to be able to do something based on a particular value. For example, checking to make sure the user is inputting valid values. Would it be reasonable for a user to input a test score of -20 or 152? Well, 152 might be reasonable if the test was based on 200 points, but -20 is not reasonable!

1. The Ctrl Menu

- Click the O button
- Type in the name: **Temp**
- Click **OK**
- Open the Ctrl menu and look around. The Ctrl menu contains command statements that let us control what happens *based on conditions*.



2. Using an If Then Statement

We can use an **If Then** statement to check for valid input or perform different actions based on input. The "syntax" of an **If Then** statement is as follows:

If *something is true*

Then

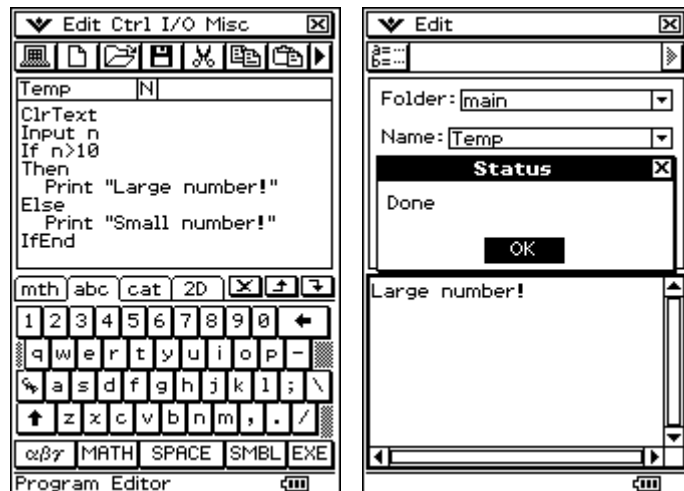
Do this...

Else

Do this...

IfEnd

- Type in the program exactly as shown
- Run the program a few times
- Input at least one number greater than 10 and one number less than ten
- Does the logic of the If Then statement make sense?



3. Walking Through a Program

An excellent way to understand programming is to do what is called a code walk through. To “walk” through code, we make up values as needed and then walk the value through the code. For example, consider these programs:

- (a) This is a **walk through** of program (a) shown below.

If we run this program, what happens?

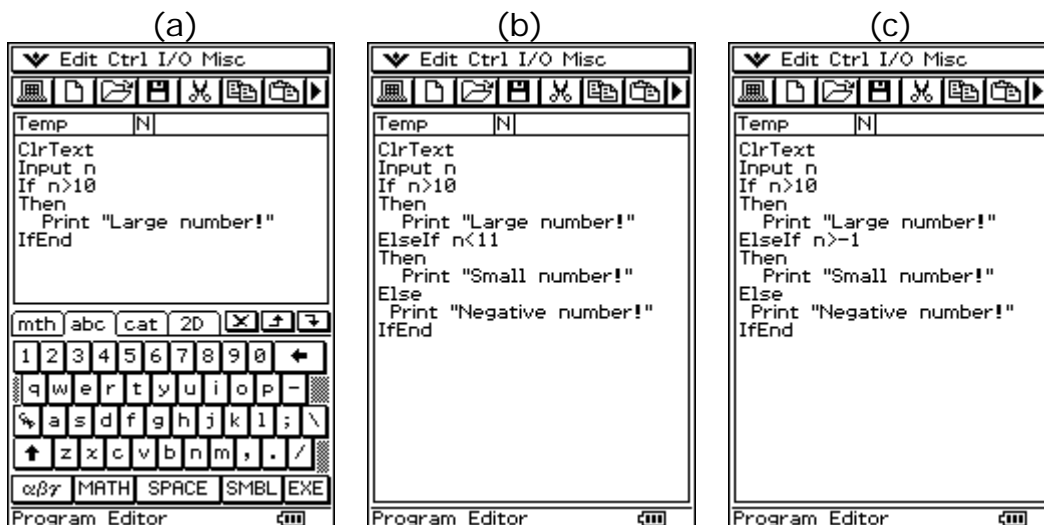
- o We input a number. Assume you input 12.
- o 12 is stored in n ($n=12$).
- o $12 > 10$, so “Large number!” is printed.
- o Program ends.

If we run the program again, what happens?

- o We input a number. Assume you input 5.
- o 5 is stored in n ($n=5$).
- o $5 > 10$ is false.
- o Program ends (nothing is printed).


- (b) **Using a pencil and paper**, try walking through **program (b)** with $n=1$, $n=15$ and $n=-3$. Write down what you think the output will be for each. When finished, type in the program and then run it with $n=1$, $n=15$ and $n=-3$. How do these answers compare with your walk through results?

- (c) **Try walking through program (c)** with $n=1$, $n=15$ and $n=-3$. This program is organized a little better. Remember, programs will do exactly what we instruct them to do.



PART III

Practice Exercises

1. Begin a new program named **Drive** by clicking  and inputting the program name.
2. Write a program (using an If Then Else statement) that will do the following:
 - Ask the user what their name is.
 - Ask the user their age.
 - Display the user's name.
 - On the next output line:
 - o If they are 15 years or older, display the message: You can drive the car.
 - o If they are between 5 years and 14 years of age, display the message: You can ride the bicycle.
 - o If they are under 5 years of age, display the message: Ask your mother or father for a ride.
 - o If they are less than 0 years old, display the message: You are not born yet!
3. Run your program and input an age of 15. With the output window showing, get a **screen capture**. Paste it into your Lesson15 document (under a title of PART III).
4. Run your program and input an age of 8. With the output window showing, get a **screen capture**. Add two blank spaces following the first screen capture and then paste this one.
5. Run your program and input an age of 3. With the output window showing, get a **screen capture**. Add two blank spaces following the last screen capture and then paste this one.
6. Run your program and input an age of -43. With the output window showing, get a **screen capture** and then paste it on the next line.

PART IV

Reflection Exercises

You have just completed the fifteenth lesson in ClassPad 101. We will continue to write programs in Lesson 16; try to complete Lesson 16 right away. Please take a few moments to copy and paste the following three questions at the end of your Lesson15 document and answer them.

1. Approximately how long did it take you to complete this lesson?
2. Which activity did you find particularly useful?
3. Did you find any part of this activity difficult to follow? If so, which part? Also, how did you overcome the difficulty?

Assessment 15: Introduction to Programming

- **Checkpoint:** Your word processed document, titled "Lesson15", should contain the following activities:
 1. Three screen captures from PART I.
 2. Three screen captures from PART II.
 3. Four screen captures from PART III.
 4. Three reflection questions with answers from PART IV.
- **Submit** your **Lesson15 document** to your instructor for grading. Once your lesson is submitted, your lesson for ClassPad 101 "Intro to Programming" is complete.