Kids College – Computer Game Programming
Exploring Small Basic and Procedural Programming

According to Microsoft, Small Basic is a programming language developed by Microsoft, focused at making programming accessible and easy for beginners. It consists of three distinct pieces: the language, the programming environment and libraries.

The **Language** draws its inspiration from an early variant of BASIC but is based on the modern .NET Framework platform. The **Environment** is simple but rich in features, offering beginners several of the benefits that professional programmers have come to expect. A rich set of **Libraries** help beginners learn to write compelling and interesting programs.

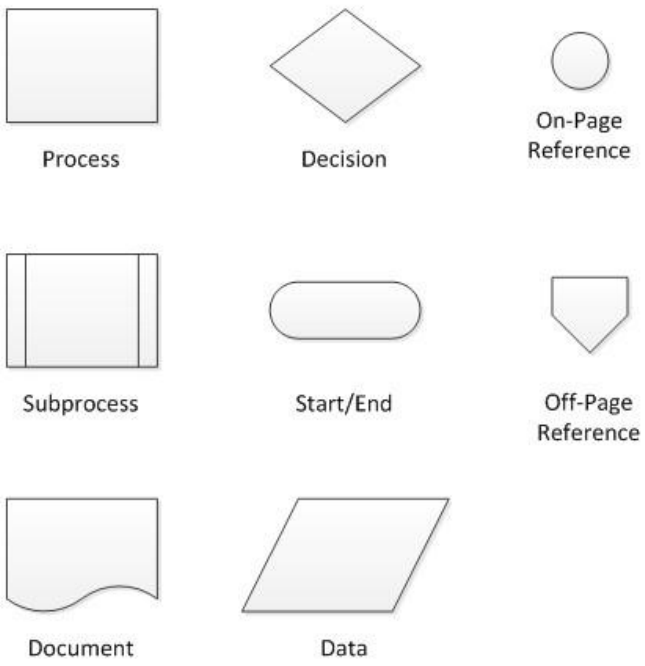
Installing and Starting Small Basic at home

- Open a web browser such as Internet Explorer or Mozilla Firefox. Navigate to http://msdn.microsoft.com/en-us/beginner/ff384126.aspx, click on the link Download Small Basic, click on the run button. Or you can visit www.lperezonline.com/kidscollege and click on the link to Small Basic
- Click on the start button and type Small Basic and the program will launch

The Programming Process

- Define the problem to be solved precisely in terms of input, processing, and output.
- Design a detailed logic plan using flowcharts or some other logic tool.
- Desk check the logic plan as if you are the computer.
- Code the program.
- Desk check the code as if you are the computer.
- Enter the program into the computer.
- Test the program until it is error free.
- Run the program using the input data to generate the output results.

Flowchart Symbols



Problem 1
Input two numbers, add them, and output the sum

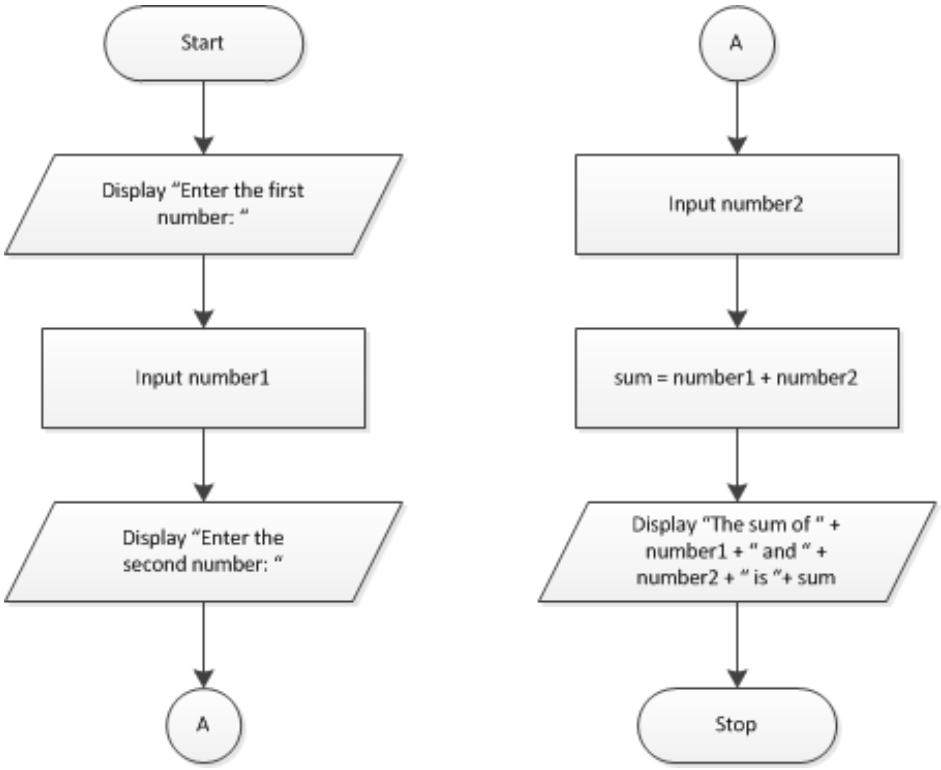
Variables
In programming, a variable is a structure that holds data and is uniquely named by the programmer. It holds the data assigned to it until a new value is assigned or the program is finished. In the following flowchart, number1, number2, and sum are all computer variables.

Variables have a name, value and data type. The name is assigned by the programmer in the program.

The value is assigned either by the programmer in the program or by the user during execution (run-time) of the program.

The data type of the variable is the kind of data that is contained in the variable such as numbers, characters, and memory locations.

Problem 1 Flowchart



How to Use the Small Basic Integrated Development Environment (IDE)

- Go to the Windows Start button 
- Choose Microsoft Small Basic
- Type in the program

- Save the program – Click on the Save icon 

- Give the program a name, for this program we'll use FirstBasicProgram

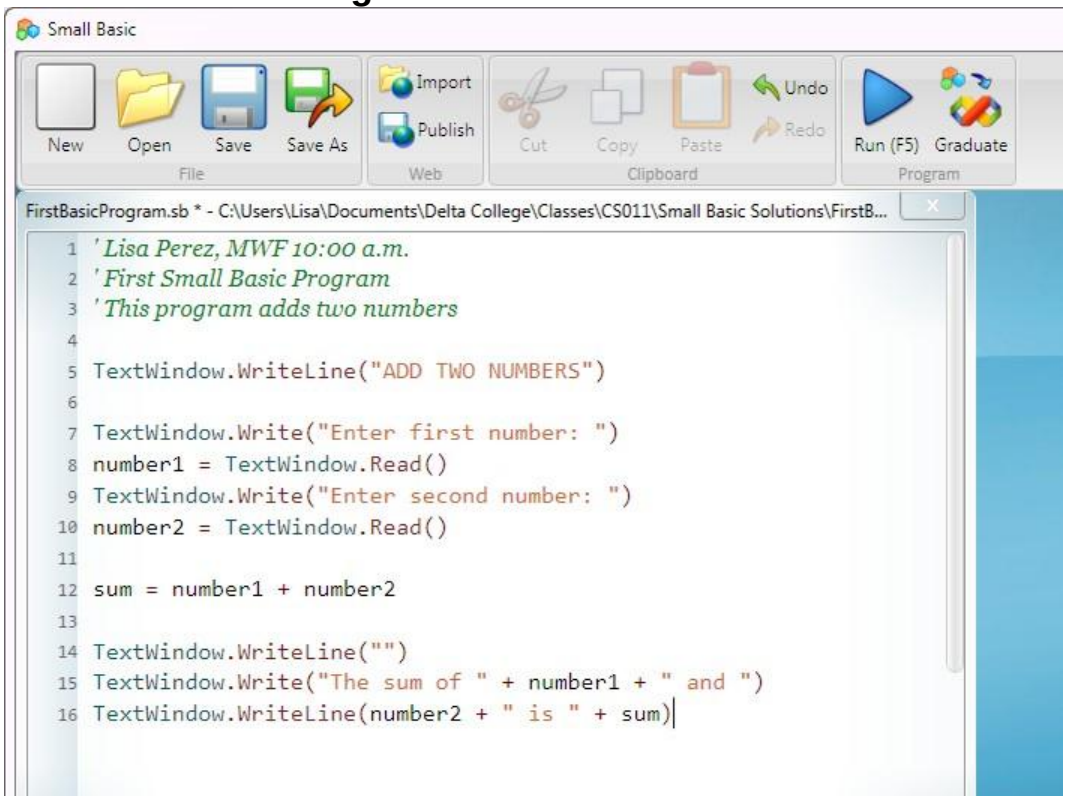
- Run the program – Click on the Run icon 

- Test the program with a representative set of input values

Small Basic Operators

- Arithmetic * (mulitiply), / (division), + (addition), - (subtraction)
- Relational = (equal), > (greater than), >= (greater than or equal to), < (less than), <= (less than or equal to), <> (not equal)
- Logical NOT, AND, Or

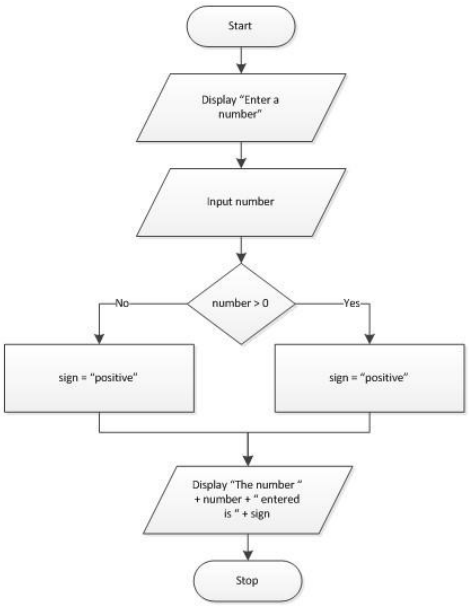
Small Basic 1st Program



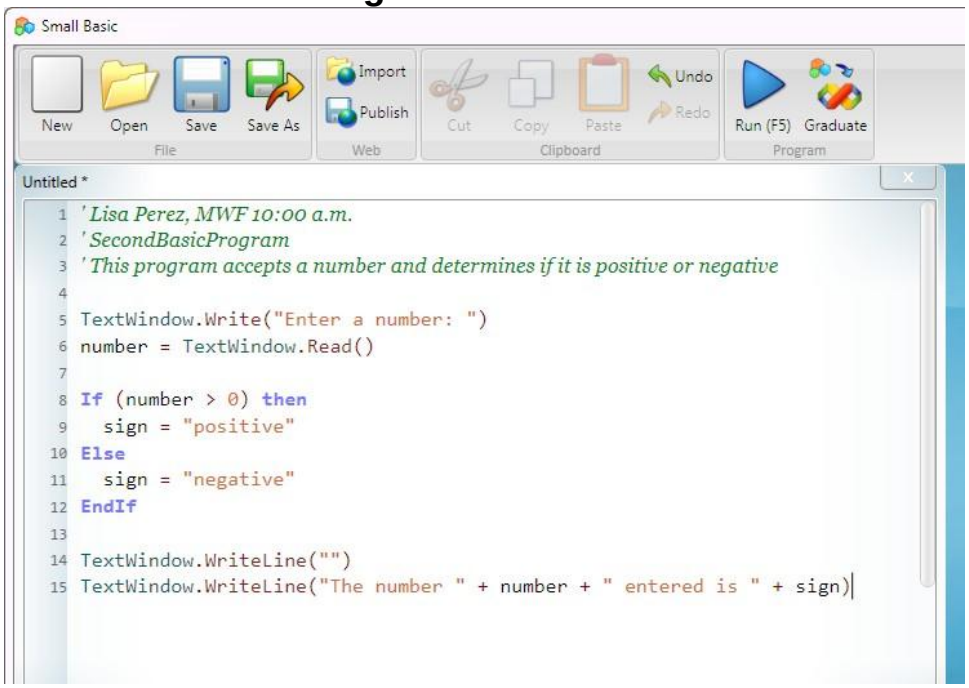
Problem 2

Input a number. Tell whether it is positive or negative.

Problem 2 Flowchart



Small Basic 2nd Program



Problem 3

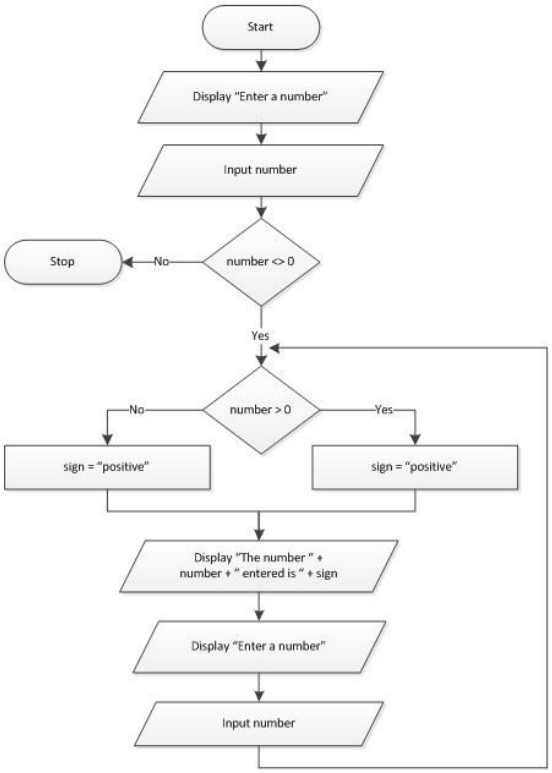
Input a number. Tell whether it is positive or negative. Repeat while the number is not equal to 0.

Loop Control Variables

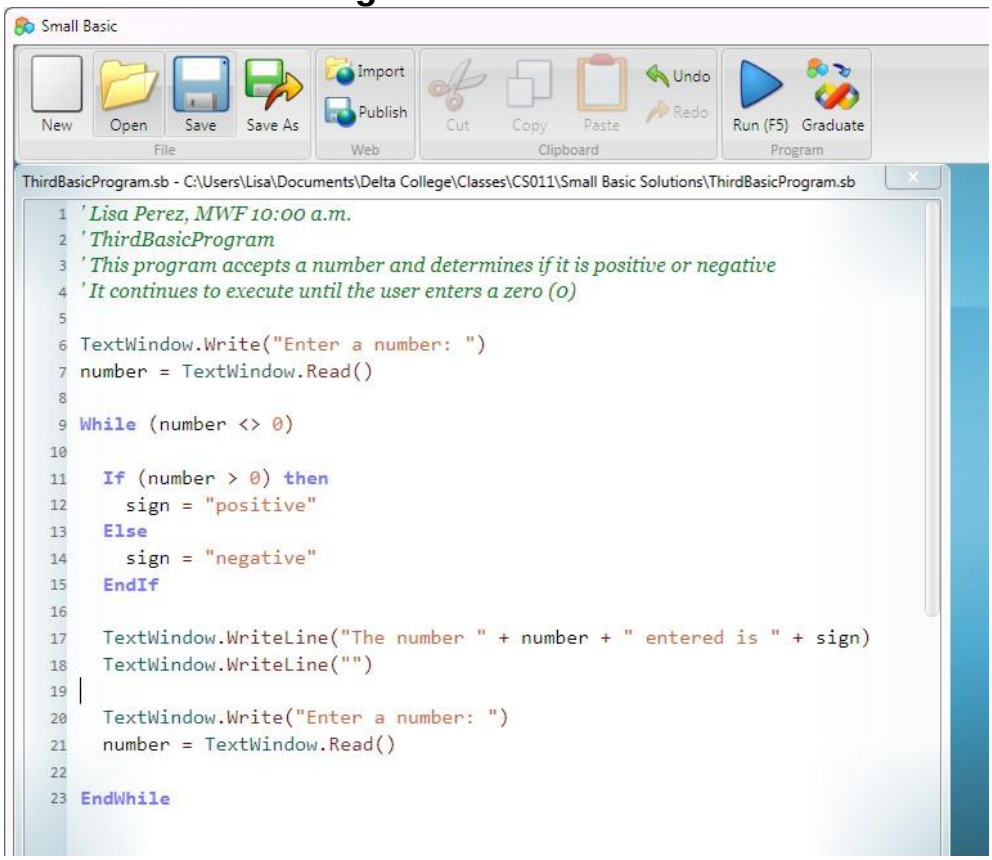
In order to work, loops need a loop control variable. The loop control variable must be:

- Initialized before it is tested (outside the loop)
- Tested to control the loop execution
- Changed within the loop body

Problem 3 Flowchart



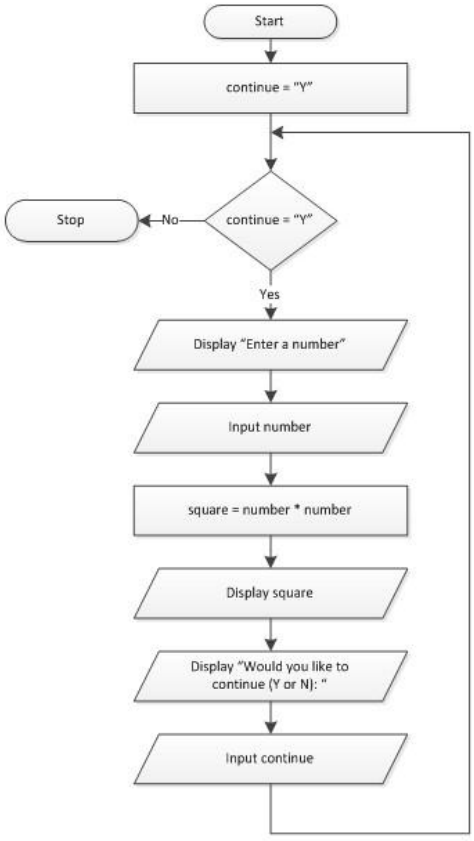
Small Basic 3rd Program



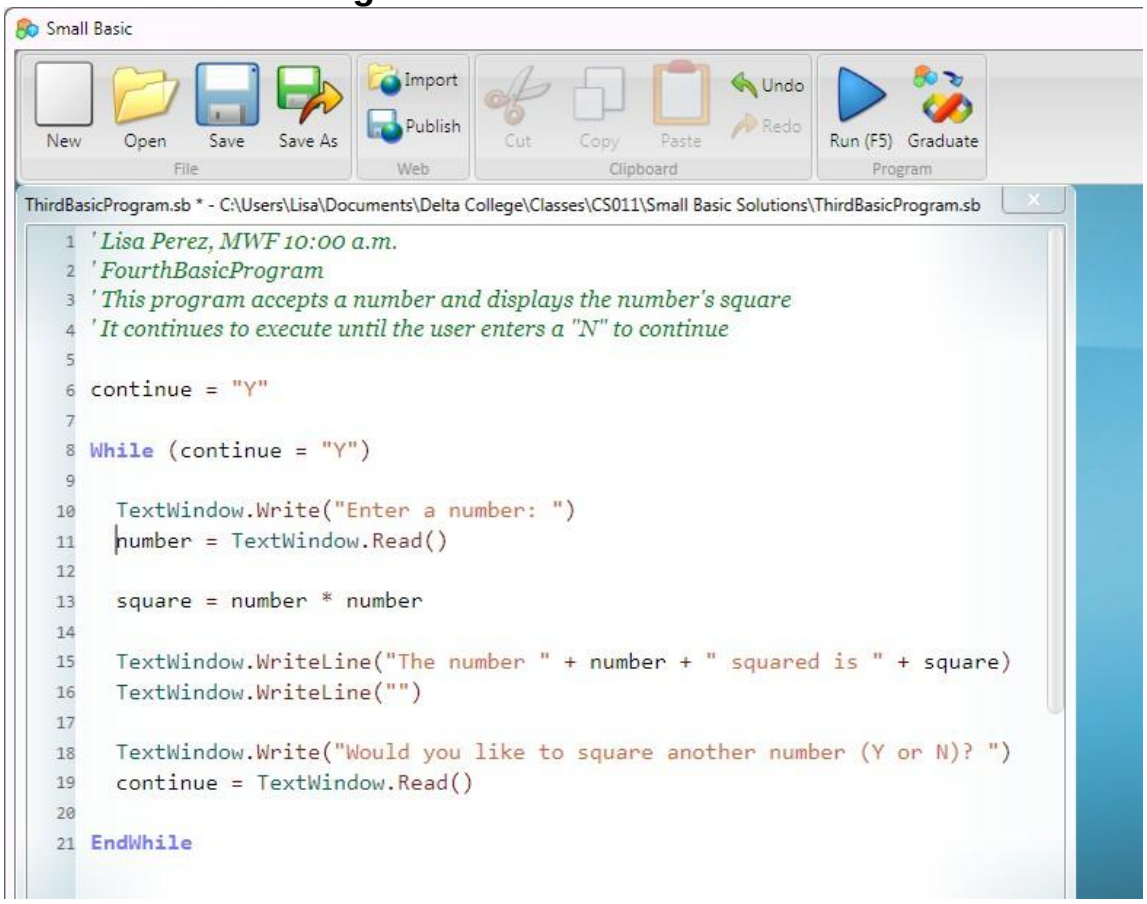
Problem 4

Input a number and output the square of the number. Repeat while the user indicates to continue.

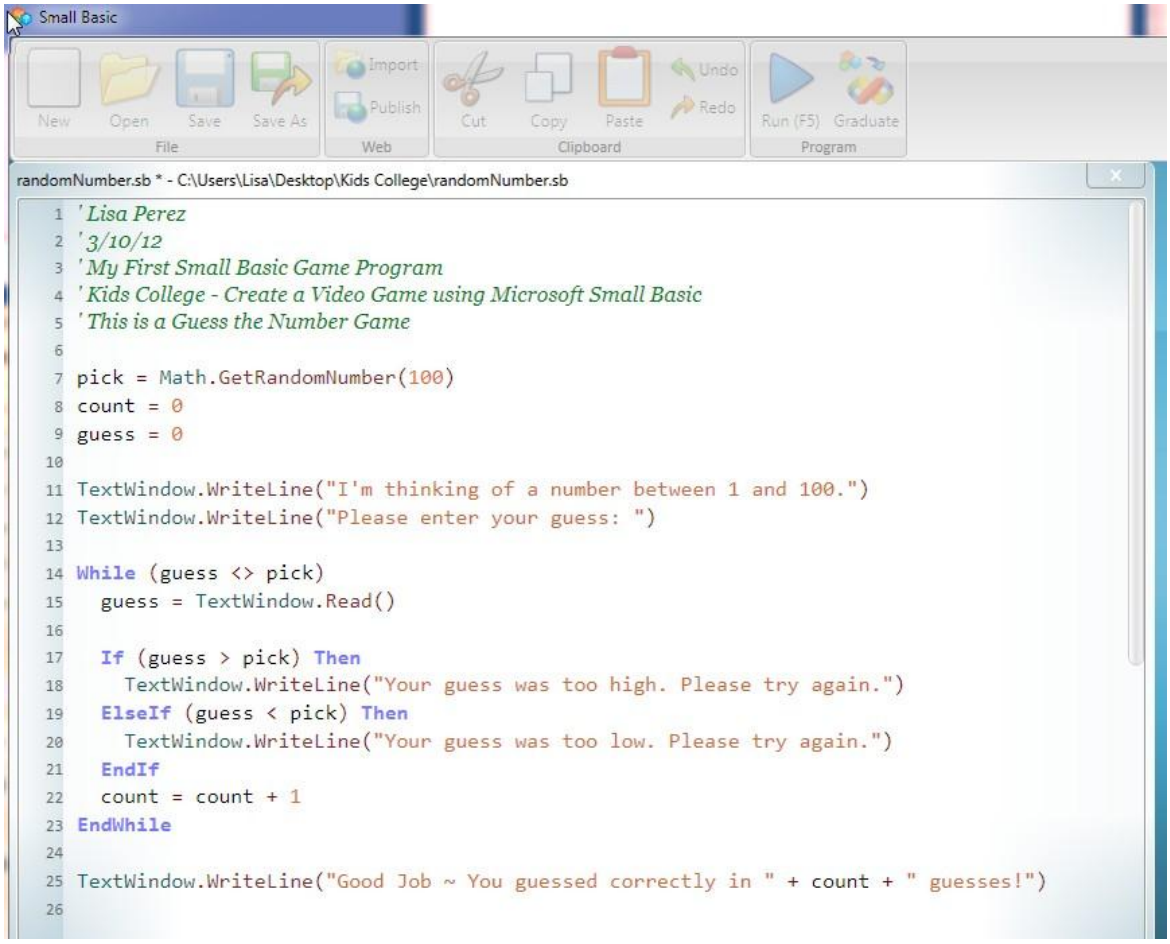
Problem 4 Flowchart



Small Basic 4th Program



Creating a Small Basic Game – Guess the Number



Your Turn:

Can you program Small Basic to do the rock, paper, scissors game (also called roshambo)?

Game Play

In rock, paper, scissors the objective is to select an object which defeats that of the opponent. Objects are resolved as follows:

- rock defeats scissors
- scissors defeats paper
- paper defeats rock

If both players choose the same object, the game is tied and the players throw again.

Compare and Contrast:

What is the same with Alice and Small Basic? What is different? Which language do you prefer and why? Which language is easier and why? Which language is a “real” programming language?

You can find these handouts and other Kids College Computer Game Programming information by visiting www.lperezonline.com/kidscollege. Hope you enjoyed the class!