YEAR END PROJECT 2080

TRAILBLAZERS – 1

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ALGORITHM

To develop a Simple Calculator, I have developed to algorithms. The First algorithm is Algorithm-1 which is named as 'simpleCalculator'. The Figure 1 shows the Algorithm-1. This is the main algorithm of this project. It calls second algorithm- Algorithm-2 which is named as 'printMenu'. The Figure 2 shows the Algorithm-2. The second algorithm only prints the menu option. The menu option contains only four options- 1. Addition, 2. Subtraction, 3. Multiplication and 4. Division. Users are allowed only to choose one of these four options. If the user chose other option, the algorithm displays error message "Error: Choose option number 1 to 4 only". Otherwise the Algorithm 1 performs the operation that the user chose. If the user enter "number2" that equals to zero, the Algorithm-1 displays the error message "Error: Divide by zero" since no number can be divide by zero. It is an illegal operation. So it alerts user sending error message.

FLOWCHART

Flowchart is the pictorial representation of an algorithm. The two algorithms discussed in previous section are represented in a flowchart which is shown in Figure 3. The flowcharts starts with printing menu of the Simple Calculator and asks users to input one option either 1 or 2 or 3 or 4. Users are allowed only to choose one of these four options. If the user chose anything else, it displays error message "Error: Choose option number 1 to 4 only". Otherwise it performs the operation that the user chose. The flowchart also handles another error called divide by zero. A number cannot be divided by zero which is an illegal operation. Therefore, if an user enter "number2" that equals to zero, it displays the error message "Error: Divide by zero" to alert user.

Algorithm 1: simpleCalculator

Result: Addition or subtraction or multiplication ;
or division of two numbers
CALL printMenu;
SET n = 1;
while *n = 1* **do**
    INPUT: number1, number2, option
    if *option = 1* **then**
        result = number1 + number2;
    end
    if *option = 2* **then**
        result = number1 - number2;
    end
    if *option = 3* **then**
        result = number1 * number2;
    end
    if *option = 4* **then**
        if *number2 = 0* **then**
            result = "Error: Divide by zero.";
        else
            result = number1 / number2;
        end
    else
        PRINT "Error: Choose option number 1 to 4 only"
    end
    PRINT result;
    INPUT: newCalculation;
    if *newCalculation = 'y' or 'Y'* **then**
        UPDATE: n = 1;;
    else
        UPDATE: n = n + 1";
    end
end

Figure 1: Algorithm 1- simpleCalculator

Algorithm 2: printMenu

Result: Print options in the calculator
PRINT 'Simple Calculator' ;
PRINT '——————';
PRINT '1. Addition';
PRINT '2. Subtraction';
PRINT '3. Multiplication';
PRINT '4. Division';
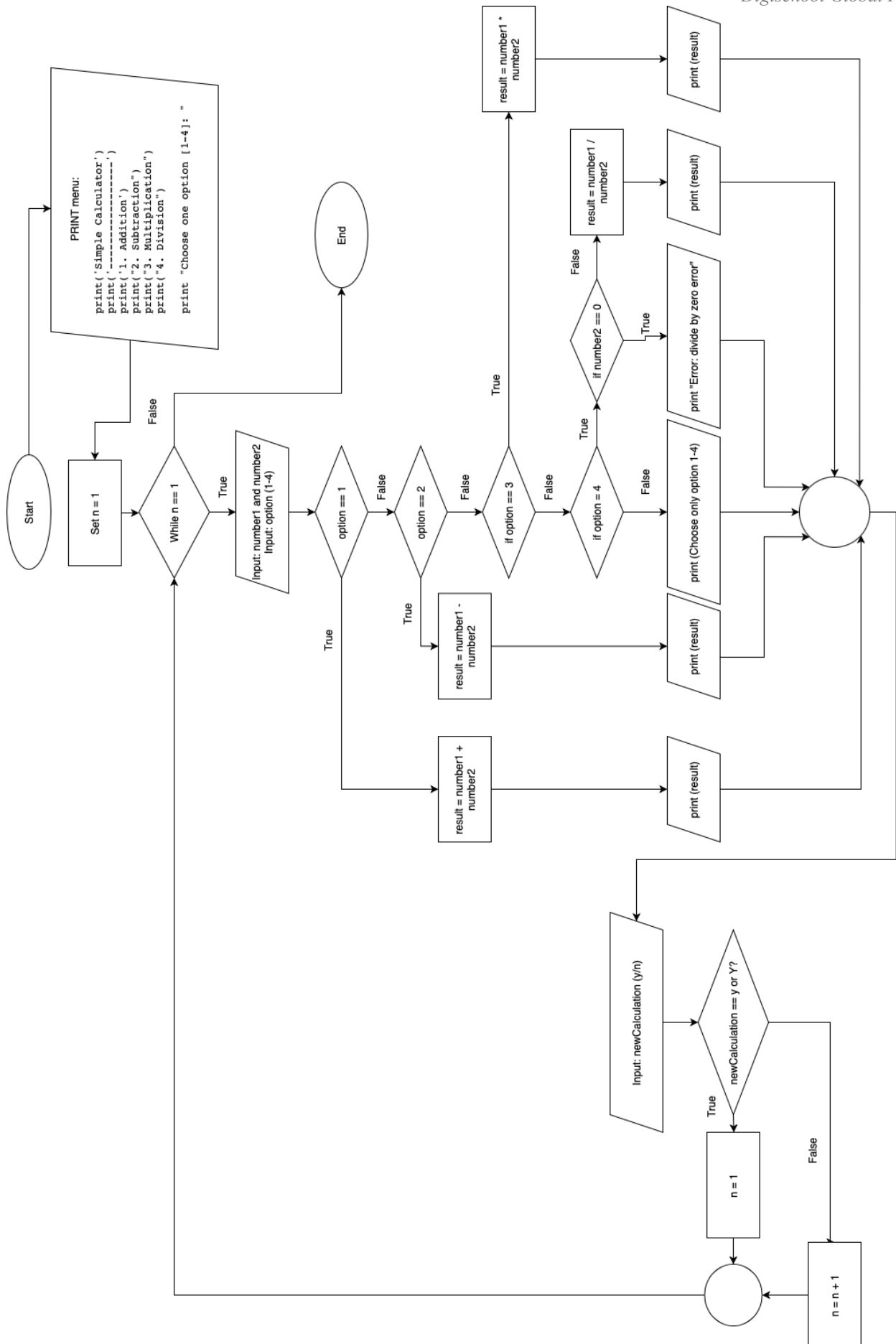PRINT 'Choose one option [1-4]: '

Figure 2: Algorithm 2- printMenu

Figure 3: Flowchart representation of Algorithm-1 and Algorithm-2.

SIMILARITIES: SCRATCH AND PYTHON

1. Both Scratch and Python are general-purpose programming languages. This means these both can be used to develop varieties of applications.

2. Both Scratch and Python languages have user friendly syntax. This means both are simple and easy to learn.

3. These both languages have large communities of users and developers

4. These both are widely used in educational fields.

DIFFERENCES: SCRATCH AND PYTHON

1. Scratch is primarily used to create amazing art, simple games, and animations. Python is a versatile programming language than Scratch. Python is frequently used by software developers in various fields such as scientific computing, data analysis, and artificial intelligence.

2. Scratch does not support object-oriented programming while Python supports object-oriented programming language.

3. The syntax of Scratch is based on blocks that snap together, while Python uses a text-based syntax that requires the use of proper indentation and syntax.

4. In Scratch, you need first create a variable before we assign a value to it while in Python, a variable can be created when we assign a value to it.

MY UNIQUENESS AND CREATIVITY

During the development of this project I have learned Python and Scratch in more detail. In addition to these, I have leaned how to write Algorithm in standard format using Latex which is a software for typesetting documents. This describes the contents and layout of the document. Furthermore, to develop the flowchart I have used the browser-based end-user diagramming software called draw.io. It is the World's most widely used application to draw or create the diagrams such as flowcharts and many other types of diagrams. I have learned and used these tools to develop the algorithms and flowchart of my project and these added my uniqueness in the project and my creativity to use and apply these tools.