

Logo Activity 8 Single Variable Input

In this activity you will learn how to design objects in many different sizes. In the past, your work was at least doubled having to create a different procedure for each size. If you designed two different sizes for trees, your angles were the same but the sides were different of different lengths. Now, you are going to learn how to use a single procedure that can be used to draw a square of any size you want. But first, you will learn about variables and inputs to procedures.

Earlier you learned that an input is a number that you supply to the computer. Many Logo commands require inputs. In the Logo statement `FD 50`, `FD` is the command used to instruct the turtle to move forward, while `50` is the input used to tell the computer how far forward the turtle is to move.

Just as some commands take inputs, procedures can also use inputs. For example, to change the size of a square, you change the length of a square's sides. The length of a side is the input following the `FD` command.

```
TO SQUARE  
  REPEAT 4 [FD 50 RT 90]  
END
```

The input for the `FD` command is `50`, while the input for the `RT` command is `90`. Next, you will change the `SQUARE` procedure such that you could draw a square of any size. Make the changes shown below.

```
TO SQUARE :SIZE  
  REPEAT 4 [FD :SIZE RT 90]  
END
```

To test the procedure type:

```
SQUARE 30  
SQUARE 90
```

This procedure defines `SIZE` as an input for `SQUARE` on the title line where the procedure is named. The number or input after `FD` has been replaced by the word `SIZE`. A colon (`:`) before it identifies it as a variable. A word or character that stands for more than one value is called a variable. The variable `SIZE` could stand for `10`, `25`, `60` or any number that you choose.

You can choose any name for a variable. It is best, however, to choose a name that describes the needed input for the procedure. In this case, the variable is named `SIZE` because the needed input is the length of `SQUARE`'s side.

To draw a square with sides of `80` steps, type

```
SQUARE 80
```

The `80` signals the computer that `80` should be placed in the procedure where ever `:SIZE` appears. The command will draw a square with `80` turtle steps on a side. To draw a smaller `SQUARE` you would type:

```
SQUARE 40
```

To draw a larger SQUARE you would type SQUARE 100.

Now, creating a design of SQUAREs is an easy task. Test the following procedure.

TO DESIGN

```
SQUARE 30 RT 10  
SQUARE 40 RT 10  
SQUARE 50 RT 10  
SQUARE 60 RT 10
```

END

Type DESIGN to test your procedure.

Remember, procedures that you write that use inputs behave exactly like Logo commands that use inputs. Whenever a procedure is written requiring an input, you must always provide the value for the input name when using that procedure. For example, if you type:

SQUARE

and press ENTER, Logo will say:

SQUARE needs more inputs

“How To” Movie

[Using Procedures With Variables](#)

Name _____

Logo Assignment #8

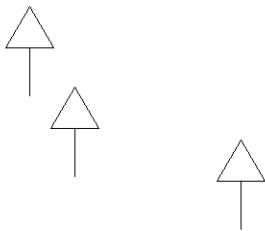
- 1) Write a procedure that creates a triangle with an input variable. Report the procedure here! What command creates a small triangle? What command creates a larger triangle?

- 2) Write a procedure to create a tree (shown below). You must make the tree start and finish at the same point. You must make the starting direction the same as the final direction.

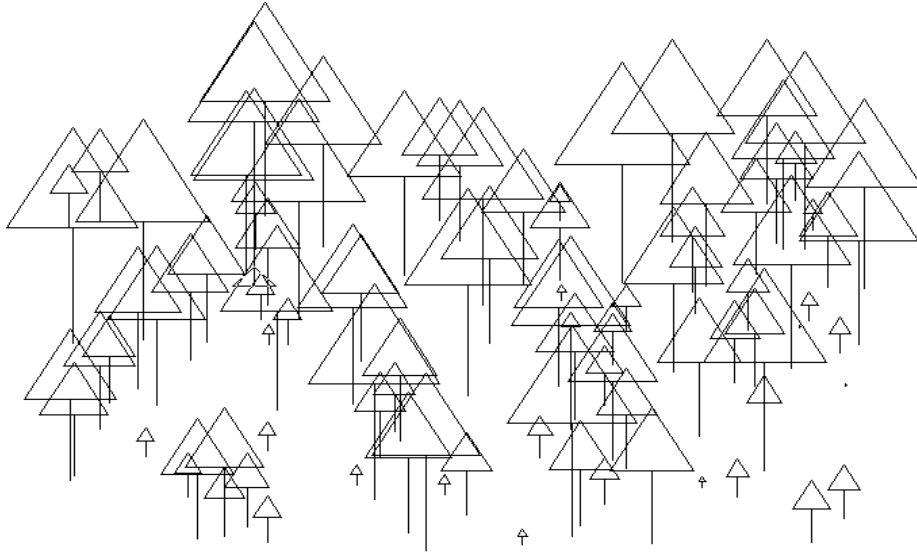


If you have not already done so, change the procedure to allow a user to input the **size** of the TREE. Record the procedure here.

- 3) Create a procedure called FOREST that will make three trees of the same size, but at different positions (SETXY) on the screen.



- 4) Now, create 100 trees in a FOREST. Randomly place each TREE on the screen AND randomly generate each tree to be of a different size. Report the FOREST procedure here!



- 5) Create a sky full of five pointed stars all of different sizes. Let the bottom half of the screen be ground. Place the stars on the upper half of the screen. Print out your procedures.

Extra Credit

1) Create the SNOWMAN below. Your development should proceed as follows:

- a) Design a HAT procedure.
- b) Create a procedure that will make a CIRCLE and a HALF.
- c) Alter the CIRCLE and a HALF procedure so that a user can input the size.
- d) Create a procedure called SNOWMAN made up of the HAT and at least three different sized circles.



Report your procedures below.