

Introduction to Logo

What is Logo?

Logo is a programming language that was developed at the MIT Artificial Intelligence Lab in the 1970s. It was designed to be used as an introduction for people to both programming and artificial intelligence. However, while it is easy to learn, Logo is a powerful language. Once you know the basics, Logo can be used to do extremely complicated things. Logo code has been used in telecommunications, multimedia software and robotics. Finally Logo is FUN!

What is the turtle?

When Logo started, the Turtle was a robotic creature which sat on the floor and was directed to move around by a user typing commands on a computer. Today the turtle is represented by an icon on the screen and can be made to draw on the screen using the same commands. In some environments the turtle looks like a turtle (with head, tail and feet) in others represent the turtle with a triangle.

Some Logo Commands

The following are some of the most use full commands in the Logo Language, which you will want to become familiar with:

FORWARD - Follow this command with a number (such as: 10 or 1000.) A small number will cause the turtle to move forward a short distance. A larger number will cause it to move further. If you select a large enough number the turtle will go off the canvas and wrap around to the other side.

BACK- Follow this command with a number, the same as **FORWARD**, only this time the turtle will move backwards.

RIGHT - Follow this command with a number between 0 and 360. The turtle will turn right specified number of degrees.

LEFT - Follow this command with a number between 0 and 360. This command is the same as **RIGHT** only it will turn the turtle left, not right.

PENUP - This command will cause the turtle to pick up its “pen” up so that you can move the turtle without drawing a line.

PENDOWN - This is the command you would use to put the “pen” back down so you can draw again.

SETPENCOLOR - You can change the color your turtle draws in. Follow the command with a number to get different colors. For example “**SETPENCOLOR 0**” would give you a black pen.

CLEAN- This command will erase the canvas

HOME- This command will move the turtle back to the center of the canvas

The Repeat Command

You can get your turtle to do one (or several) things repeatedly, without typing them again and again using the REPEAT command. Typing

```
REPEAT 4 [FORWARD 10]
```

Would cause the turtle to move forward 10 spaces, 4 time. So, in total the turtle would move forward 40 spaces.

Now Try These

Type:

```
REPEAT 4 [FORWARD 50 RIGHT 90]
```

You should get a square. For a bigger square try replacing 50 with 100 or 200.

Type:

```
REPEAT 360 [FORWARD 2 LEFT 1]
```

You should get a circle. For a smaller circle try replacing 2 with 1. Can you make a bigger one?

Your First Program

That's a lot to type every time you want to make a square or circle though. Can it be easier? YES. You can teach Logo what a square (or a circle, or a flower) is by making it a program.

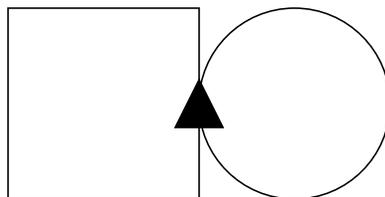
Try typing:

```
TO SQUARE  
REPEAT 360 [FORWARD 80 LEFT 90]  
END
```

Now type SQUARE and see what happens.

How would you write the program CIRCLE?

How would you write the program CIRCLE_AND_SQUARE to make a drawing that looks like this (where the black triangle is the turtle at the end)?



TO CIRCLE_AND_SQUARE

```
TO CIRCLE_AND_SQUARE  
HOME  
CLEAN  
CIRCLE  
FORWARD 52  
REPEAT 3 [ LEFT 90 FORWARD 104]  
LEFT 90  
FORWARD 52  
END
```

```
**** CIRCLE was defined as:  
    TO CIRCLE  
    REPEAT 360 [FORWARD 1 RIGHT 1]  
    END
```