

Python

An Introduction to Programming

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TURTLE-GRAPHICS

While walking around on your screen, the *turtle* leaves a visible trace. By telling the turtle how to move—such as “turn left” or “go forward five steps”, you determine the figure it is drawing.

This is just a very small sample of a larger script, meant to display how to use the `tkDocument-template`.

1 Moving the Turtle

Objectives In this section you will learn:

- ▷ to write simple programs, and draw graphics using turtle graphics.
- ▷ to move the turtle using the commands `left`, `right`, and `forward`.

Introduction Your first programs will be a sequence of instructions for the turtle. Once you have completed writing your program, the turtle will follow your program line by line and obey each instruction—as long as it understands what you want it to do.

However, since the turtle is really not that clever, you must be very careful with your instructions. Even small typing errors will cause the turtle to be lost, and it will immediately stop executing your program.

The Program This is your first program. Enter the commands into the editor, make sure you get all the spaces and case right, and then execute the program by clicking the green “play”-button. The turtle should then draw a right-angled triangle.

```
1 from gturtle import *
2
3 makeTurtle()
4
5 forward(120 * 1.414216)
6 left(135)
7 forward(120)
8 left(90)
9 forward(120)
```

In order to use the turtle, you must first load the file (called a “module” in Python) containing the turtle and its commands. This file is called “gturtle”. Once you have loaded the module (using `import` as in the first line above), use `makeTurtle()` to open a window for the turtle to draw in.

Important At the beginning of each turtle-program, you need to load the turtle-module, and open a new window:

```
from gturtle import *  
makeTurtle()
```

Afterwards, you are free to combine as many instructions to the turtle as you like. Each instruction has to be written on a line of its own. Some of the instructions the turtle will always understand are as follows:

<code>forward(s)</code>	Move s pixels forward.
<code>back(s)</code>	Move s pixels back.
<code>left(w)</code>	Turn by w degrees left.
<code>right(w)</code>	Turn by w degrees right.
<code>dot(d)</code>	Paint a dot with a diameter of d pixels.
<code>speed(-1)</code>	Make the turtle as fast as possible.

EXERCISES

1. Have the turtle draw a square or a small house.
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