Python Syntax Quick Reference for On-Ramp to Robotics Unit 1: Motion with Mars Rover Challenge

TI-84 PLUS CE PYTHON

Python Statement	Example	Behavior
import module_name as name_space	`import ti_rover as rv`	Required for all TI Rover Python programs. Imports the ti_rover module into the Python program. The module provides the methods for controlling the Rover. Sets the current position of the RV as the origin and the heading as 0 degrees measured from the x-axis. The import ti_rover as rv statement is available from the Fns>Modul>ti_rover>Drive menu.
from module_name import *	`from ti_system import *`	Imports all the functions in the **ti_system** module for use in the program. It is necessary to import the ti_system module to use sleep( ). The from ti_system import * statement is available from the Fns>Modul>ti_rover>Commands menu.
rv.motor_right(+/- power/speed, time) rv.motor_left(+/- power/speed, time)	rv.motor.left(75,5)	Left motor spins slowly clockwise for 5 seconds Motor power values range from 0 (off) to 255 (maximum). The sign of the power value determines the direction of the motor. Positive values spin clockwise and negative values spin counter-clockwise. Motor functions are available from the Fns>Modul>ti_rover>I/O>Outputs menu.
rv.motors("left wheel direction", left wheel power, "right wheel direction", right wheel power, time)	rv.motors("ccw",200,"cw",200, 10)	Both motors spin and Rover moves forward for 10 seconds The rv.motors() function send signals to control both left and right motors at the same time. Motor power values range from 0 (off) to 255 (maximum). Wheel directions are "CCW" (counter-clockwise) and "CW" (clockwise). Motor functions are available from the Fns>Modul>ti_rover>I/O>Outputs menu.
rv.forward(distance, "unit")	rv.forward(1.2, "m")	Rover drives forward 1.2 M at default speed of .20 M/S ** The rv.forward(distance,"unit") function is found on the Rover Drive with Options menu. Unit options are "grid units" (10 centimeters is the default), "m" (meters) and "revs" (wheel revolutions). rv.forward(distance, "unit") is found toward the bottom of the Fns>Modul>ti_rover>Drive menu.
rv.forward_time(time duration in seconds)	rv.forward_time(4.5)	Rover drives forward for 4.5 seconds at default speed of .20 M/S ** rv.forward(time) is found toward the bottom of the Fns>Modul>ti_rover>Drive menu.
rv.backward(distance, "unit")	rv.backward(1.2, "m")	Rover drives backward 1.2 M at default speed of .20 M/S ** Unit options are "grid units" (10 centimeters is the default), "m" (meters) and "revs" (wheel revolutions). rv.backward(time) is found toward the bottom of the Fns>Modul>ti_rover>Drive menu.

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rv.right (angle)
 	
rv.left (angle)
	`rv.right()`
	
	`rv.right(45)`
		Rover spins to the right 90 degrees (If no value is entered for angle_degrees, rv.right() and rv.left() use the default value of 90), followed by a spin of another 45 degrees to the right.
		
		For angle units other than degrees, use rv.right(angle,"unit") toward the bottom of the Rover Drive menu.

print(value or "text string")	`n=3`
	`print(n)`
	`print("number= ")`
	`print("number= ",n)`
		Prints value of variable n, which is 3; then on the next line prints the text string "number= "; finally prints "number= " followed by the value of variable n all on the next line.
		
		print() is available from the Fns>I/O menu.

sleep(seconds)	`sleep(1.5)`	The calculator will wait 1.5 seconds before moving to the next line in the program. sleep() is available from the Fns>Modul>ti_rover>Commands menu.
for i in range(size): block	`for i in range(10):` `print(i)`	Repeats the statements in the block ten times, printing the value of the index variable, i, as 0,1,2,...9. The index variable, i, starts at 0 and increases by 1 with each loop. If i is less than the size value, 10, the loop continues to repeat. The block starts with a colon and includes the indented lines that follow. The for loop statements are found on the Fns>Ctl menu.

See the Rover module section beginning on page 26 of the Python Programming for the TI-84 Plus CE Python Graphing Calculator Guidebook for more programming information.

* The speed of the Rover will vary from the stated values depending on the floor surface. Some surfaces cause Rover to move more slowly. If accuracy is important, the speed should be measured by a method similar to the one in this activity

** The LEFT and RIGHT turns are made with a frame of reference from Rover's driver's seat.

*** Radians is an angular unit of measure used in mathematics. There are 2π RADIANS in 360° DEGREES.

**** Gradians is an angular unit of measure also used in mathematics. There are 100 GRADIANS in a quarter circle; hence 400 grads in a full circle.