**Virtual Initio Programming:**

**Python Statements and Initio Commands**



**AIM:** After completing this worksheet you should be able to control your Initio simulation using simple statements issued at the Python Command Line and be able to explain what a statement in a programming language is.

**You Need:** To complete this worksheet you need to have a virtual Initio simulator (see WS1), and understand how to control the virtual Initio from the IDLE command line (see WS2).

**If the simulator isn’t already running:**

Start it (see WS1), and select the Initio robot and default\_world.xml. Now open a new IDLE window.

**Remember:** You can scroll back through commands in IDLE by typing *alt-p*

In order to control your robot simulation you need to *initialise it properly.*

To initialise your simulation, type the following at the Python Command Line

>> import simclient.simrobot as initio

>> initio.init()

Now you can use simple commands to control your simulated robot. Try typing the following:

>> initio.forward(20)

>> initio.stop()



**Question 1:** What happens?

Each of these commands initio.init(), initio.forward(20), initio.stop() is a *python statement.* Statements are the basic commands that are used to build up programs. You have several commands available to you for operating the Initio robot.

These commands are described in the box on the next page. Not that parts in *italics* are inputs to the commands which you have to select. So for **initio.spinLeft(***speed***)** you have to replace *speed* with a number between 0 and 100.

**initio.stop()**

**initio.forward(***speed***)**

where *speed* is a number and 0 <= *speed* <= 100

**initio.reverse(***speed***)**

where *speed* is a number and 0 <= *speed* <= 100

**initio.spinLeft(***speed***)**

where *speed* is a number and 0 <= *speed* <= 100

**initio.spinRight(***speed***)**

where *speed* is a number and 0 <= *speed* <= 100

**initio.turnForward(***leftSpeed, rightSpeed***)**

where *leftSpeed* and *rightSpeed* are numbers and

 0 <= *leftSpeed, rightSpeed* <= 100

**initio.turnReverse(***leftSpeed, rightSpeed***)**

where *leftSpeed* and *rightSpeed* are numbers and

 0 <= *leftSpeed, rightSpeed* <= 100

**initio.setServo(***servo, angle***)**

where *servo* is either 0 or 1 and -90 <= *angle* <= 90

Try typing the following:

>> initio.setServo(1, 45)



**Question 2:** What happens?

initio.setServo controls two *servo motors* that move the sensor at the front of the robot*.* It takes two inputs: the number for the servo (0 is for *tilt* which moves the sensor up and down. 1 is for *pan* which moves the sensor from side to side), followed by the angle in degrees you want to move it to (where 0 means it is pointing forwards dead centre). So the command you just typed gets the servo to pan 45 degrees to the right from the centre point.

Unfortunately, the virtual Initio doesn’t have a tilt servo so you can not use the command to tilt the sensor.

You will learn more about sensors in worksheet 4.

**Question 3:** Try four of the other commands from the table. What do they do?

**Command Result**

**Remember:** When you have finished working with your robot type:

**initio.cleanup()**

When you want to exit the simulator, select the simulator window and type Q.



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