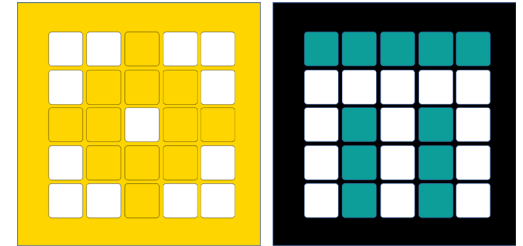


PRIME LESSONS

By the Makers of EV3Lessons

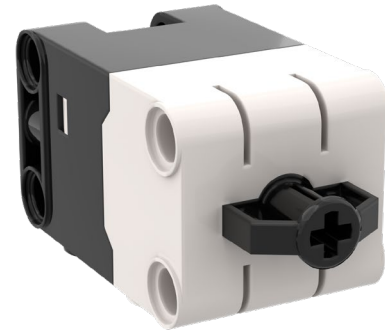


INTRODUCTION TO FORCE SENSOR

BY SANJAY AND ARVIND SESHAN

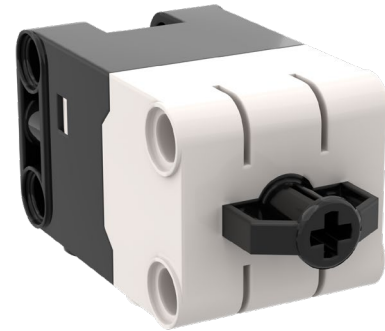
LESSON OBJECTIVES

- Learn how to use the Force Sensor
- Learn how to use the Wait Functions
- Note: Force Sensor does not come with Robot Inventor. However, the python environment for Robot Inventor does support the sensor.



WHAT IS A FORCE SENSOR?

- The Force Sensor does two main types of sensing:
 - Touch sensing
 - Force sensing
- You can measure the Force in percent or Newtons



The following methods are available

```
.is_pressed()  
.get_force_newton()  
.get_force_percentage()  
.wait_until_pressed()  
.wait_until_released()
```

HOW DO YOU PROGRAM WITH A FORCE SENSOR

- Just like with motors, the force sensor must be initialized before use

```
force = ForceSensor( 'F' )
```

↑
Name for
the sensor

↑
Port

- There are two modes of the force sensor
- The two modes are
 - Pressed – even a gentle tap is detected
 - Released – hold the sensor in and release it any amount

Waiting until pressed/released:

```
force.wait_until_pressed()
```

```
force.wait_until_released()
```

or using while loops...

```
while (not force.is_pressed()): pass
```

```
while (force.is_pressed()): pass
```

CHALLENGE I: MOVE UNTIL PRESSED

- Program your robot to move straight until you press the sensor with your hand
- You will use the `wait_until_pressed()` method for this challenge

```
force.wait_until_pressed()
```

- **Basic steps:**
 - Set the **movement motors** for your robot (A and E for Droid Bot IV and ADB robot)
 - Set the **stop action** to brake
 - Set the **% speed** for your robot
 - **Initialize** the force sensor
 - Start **moving straight**
 - Use the **wait_until_pressed() function** to detect when the Force Sensor is pressed
 - **Stop moving**

CHALLENGE I: SOLUTION

In previous lessons, you learnt how to configure your robot. The first 3 lines set the movement motors, the stop action, and the default speed. (See [Configuring Your Robot Lesson](#))

```
motor_pair = MotorPair('A', 'E')
motor_pair.set_stop_action('brake')
motor_pair.set_default_speed(30)
force = ForceSensor('F')
motor_pair.start()
force.wait_until_pressed()
motor_pair.stop()
```

Configure robot

Start moving

Wait until the Force Sensor is pressed

Stop moving

CREDITS

- This lesson was created by Sanjay and Arvind Seshan for Prime Lessons
- More lessons are available at www.primelessons.org



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