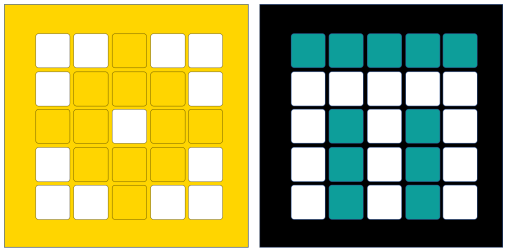
PRIME LESSONS

By the Makers of EV3Lessons

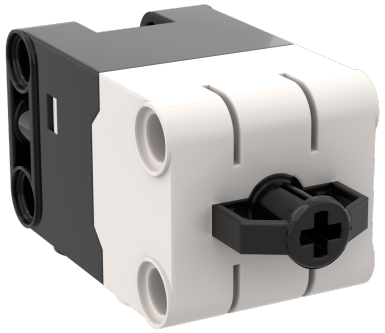


INTRODUCTION TO FORCE SENSOR

BY ARVIND SESHAN

LESSON OBJECTIVES

- Learn how to use the Force Sensor
- Learn how to use the Wait Functions
- Note: Force Sensor is not available in Robot Inventor



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

```
is_pressed()
get_force_newton()
get_force_percentage()
```

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

```
force.wait_until_pressed()
force.wait_until_released()
```

CHALLENGE 1: MOVE UNTIL PRESSED

- Program your robot to move straight until you press the sensor with your hand
- You will use the wait_until_pressed() function 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 1: 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 Arvind Seshan for Prime Lessons
- More lessons are available at www.primelessons.org