# EdPy worksheets

## Student worksheets and activity sheets

# Lesson 9: Worksheet 9.2 – Automatic lights

In this activity, you will write a program to have your Edison robot turn the two LED lights on when it gets dark.

Look at the following program:

```
1
2    #-------------Setup----------------
3
4    import Ed
5
6    Ed.EdisonVersion = Ed.V2
7
8    Ed.DistanceUnits = Ed.CM
9    Ed.Tempo = Ed.TEMPO_MEDIUM
10
11   #--------Your code below-----------
12   Ed.Drive(Ed.FORWARD, Ed.SPEED_5, Ed.DISTANCE_UNLIMITED)
13
14   while True:
15       if Ed.ReadLeftLightLevel() < 100:
16           activateBothLights(Ed.ON)
17       else:
18           activateBothLights(Ed.OFF)
19
20
21   def activateBothLights(stateOfLed):
22       Ed.LeftLed(stateOfLed)
23       Ed.RightLed(stateOfLed)
24
```

In this program, we are using the 'less than' (<) symbol to determine the path that the program will take.

If the value returned from the Ed.ReadLeftLightLevel() function is less than 100, then the activateBothLights() function is called with the input parameter of Ed.ON. Otherwise, the program moves to the 'else' part of the if statement, which also calls the activateBothLights() function, but with the input parameter of Ed.OFF.

## Your turn:

Write the program and download it to your Edison robot. You will need to create some 'tunnels' for Edison to drive through which will block out the light in order to see Edison's front lights come on.

Run the program with Edison driving in and out of tunnels to see how it works.

Then try experimenting with the value (100) in the if statement in line 15 to see what happens when you run the program with a larger or smaller number.

1. What happens when you make the value in the if statement higher?

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2. What happens if you make the value in the if statement lower?

_____

**Try it!**
Will it make a difference if you use the ReadRightLightLevel() function instead of the ReadLeftLightLevel()? Modify your program with this change and test it to see.

# Lesson 9: Worksheet 9.3 – Light following

In this activity, you will write a program so that your Edison robot will follow the light from a torch (flashlight).

Look at the following program:

```
1
2   #-------------Setup----------------
3
4   import Ed
5
6   Ed.EdisonVersion = Ed.V2
7
8   Ed.DistanceUnits = Ed.CM
9   Ed.Tempo = Ed.TEMPO_MEDIUM
10
11  #--------Your code below-----------
12
13 ▾ while True:
14 ▾     if Ed.ReadRightLightLevel() - Ed.ReadLeftLightLevel() < 0:
15             Ed.Drive(Ed.FORWARD_LEFT, Ed.SPEED_5, Ed.DISTANCE_UNLIMITED)
16 ▾     else:
17             Ed.Drive(Ed.FORWARD_RIGHT, Ed.SPEED_5, Ed.DISTANCE_UNLIMITED)
18
```

This program compares the light level between the right light sensor and the left light sensor to determine the flow of the program.

The presence of the torch on either the left or right of the robot will cause the robot to read a higher light level on that side of the robot. The logic of this program says that when the right light level minus the left light level is less than zero, the robot drives left towards the higher source of light, else the robot drives to the right.

**Your turn:**

**Task 1:** Trace the program

In worksheet 5.2, you learned about 'tracing' a program. When there are lots of calculation and different possible values in a program, it can be useful to trace the program. This allows you to understand the different values that can occur and predict the associated behaviour.

1.  Fill out the following tracing table for this program. The expected behaviour should either be 'drive forward right' or 'drive forward left'.

|  | Right_Light | Left_Light | Expected behaviour |
|---|---|---|---|
| **Torch on right** | 200 | 100 | |
| **Torch on left** | 100 | 200 | |
| **No torch** | 100 | 100 | |

**Task 2:** Write and run the program

Write the program and download it to your Edison robot. After you press the play button, shine a torch at Edison. The robot will drive towards the light. Use the torch to control where Edison drives.

2.  What happens if you change the 'less than' symbol (<) to a greater than symbol (>) in this program?

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