

Cohort Session 3, Week 2

Move the Robot

Objectives

1. Learn some basic concepts of Python.
2. Learn to write functions in Python.
3. Write a Python program to control some movements of the robot.

Please work on this lab in a group of **two or three**. Be sure to email your partner all the modified code, printouts and data. You may have to use them during your exams.

1 Equipment & Software

Download the eBot software (libdw) from [eBot Setup Guide](#) and the materials for this week's project from [1D Project website](#).

Each group should have:

1. An eBot with a USB cable for charging.
2. Installed the libdw package from [eBot Setup Guide](#).
3. `eBot_sample.py`, which contains basic code to get an eBot up and running.
4. `wk2_template.py`, which you would be writing your code on.

WARNING!

- If the robot travels too fast and gets away from you, pick it up quickly to stop it from colliding into anything.
- The robot is to be placed on the floor when it is moving. Do NOT put it on a table, lovingly adore it on your lap, balance it on your fingertips, etc.
- Take **EXTREME CARE** when attaching and removing the cable from the robot's socket – it does not take too well to rough handling.

2 Warm-up: Basic Movements and LED Control

Tasks

1. Understand the code in `eBot_sample.py`.
2. Read from temperature sensor on eBot and print out the value.

Instructions:

1. If you have not already installed the libdw package, please follow the instructions on [eBot Setup Guide](#) to set up your PC to connect to an eBot.
2. Follow the instructions on [eBot Connection Guide](#) to get your laptop connected to the eBot.
3. Run the `eBot_sample.py`.
 - a. Verify that the:
 - i. robot moves forward for 5 seconds.
 - ii. robot rotate counter-clockwise for 2 seconds.
 - iii. center LED switches off for 2 seconds.
 - iv. center LED switches on for 2 seconds.
 - b. Look for the instructors or TA if you need help with any of the above steps.
4. Modify the `eBot_sample.py` to read from the temperature sensor and print the value temperature in Celsius. You should refer to the [eBot API reference](#) to find out what is the function to use in order to obtain the temperature value. The expected output of the program is:

The temperature reading in Celsius is 25

3 Functions and User Input

Tasks

1. Write function that moves the eBot at a given speed for a certain duration.
2. Print temperature value in a specific format.

Instructions:

1. Modify the `wk2_template.py`. Your program should prompt the user to input the forward throttle value for both wheels and duration to move forward. Both of these values are passed as arguments to a function called `forward` which does not return any value. This function moves the robot forward for x number of seconds using these values. For example, if the input values are 0.7 and 3, the robot will move forward with 70% throttle on both wheels for 3 seconds.
2. At the end of the the movement, the program should print the temperature in Celsius and Fahrenheit. The expected output of the program is:

The temperature in Celsius is 25.000 and Fahrenheit is 77.000

Checkoff 1

Explain and demonstrate the working program to an instructor. The program must make use of the `forward` function and it should print the temperature value at the end of the movement. The temperature value should have three decimal places.