

# Introduction to Programming in Python

Jonghwa Park

[suakii@gmail.com](mailto:suakii@gmail.com)

GYEONGGI SCIENCE HIGH SCHOOL

# Function

- 함수는 여러 개의 프로그램 명령어들을 모아 놓은 것.
- 함수는 새로운 함수의 이름과 함수가 호출될 때 실행될 명령들 구성
- (함수의 정의란, 함수의 이름과 실행할 명령들을 모아놓은 코드입니다)

# Function

```
def print_message(): 콜론 (:)  
들여쓰기 print("GSHS")
```

함수에서 다른 함수 호출 가능

```
def repeat_message():  
    print_message()  
    print_message()
```

# 실행순서

- 프로그램은 첫 번째 명령부터 실행된다.
- 명령은 위에서 아래로 하나씩 실행된다.
- 함수의 **정의**는 함수를 **정의**할 뿐, 자동으로 실행 되지는 않습니다.
- 함수를 호출하면, 해당 함수가 실행이 된다.

Robot

# RUR-PLE

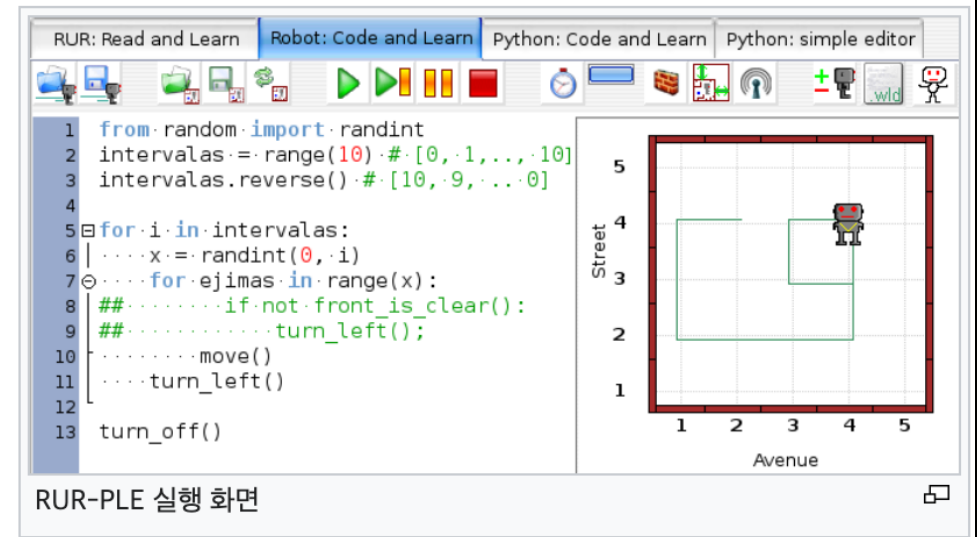
## RUR-PLE

위키백과, 우리 모두의 백과사전.

RUR-PLE(RUR - Python Learning Environment)은 파이썬을 이용한 교육용 프로그래밍 언어 환경이다. 사용자는 명령을 통해 화면에 있는 로봇을 움직이며 컴퓨터 프로그래밍에 대한 학습을 할 수 있다.

## 외부 링크 [ 편집 ]

- RUR-PLE의 홈페이지 [🔗](#)



# KAIST : hubo

## Learning Programming with Robots\*

Edited by Otfried Cheong

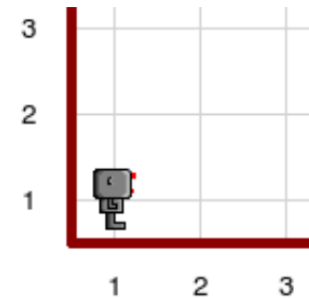
January 26, 2010

### 1 Robot world

We will learn programming by solving problems faced by a robot living in a small grid-like world. Our robot is capable of only four basic actions: moving one step forward, turning left, picking up and putting down beepers. Through the magic of programming, you will learn to have him combine those four basic actions in order to perform very complicated tasks.

Before we learn how to do all this, let's have a look at the robot's world. Open a Python interpreter window, and type in this code:

```
from csrobots import *  
create_world()
```



We can now start giving instructions to the robot. In Python, you give instructions to a robot by writing the robot's name, a dot, and the command:

```
hubo.move()
```

And immediately **hubo** will move one step forward:

# Robot\_1

```
from cs1robots import *
```

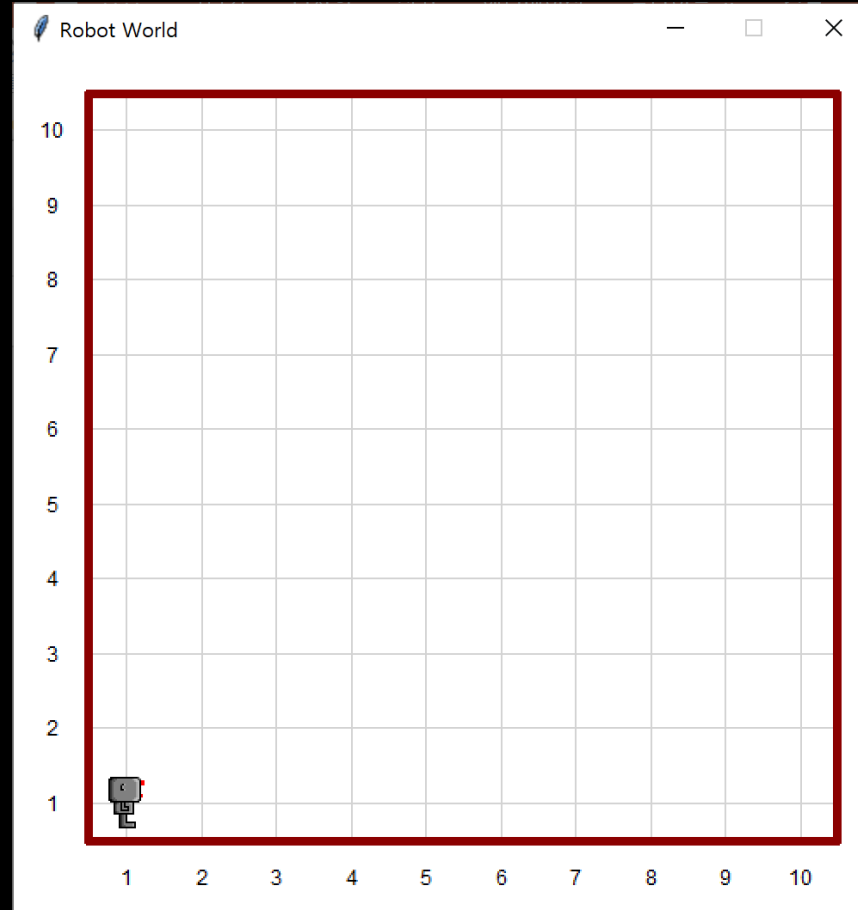
```
create_world()
```

```
hubo = Robot(beepers=10)
```

```
hubo.set_trace('blue')
```



# Robot\_1



# Robot\_2

```
from cs1robots import *
```

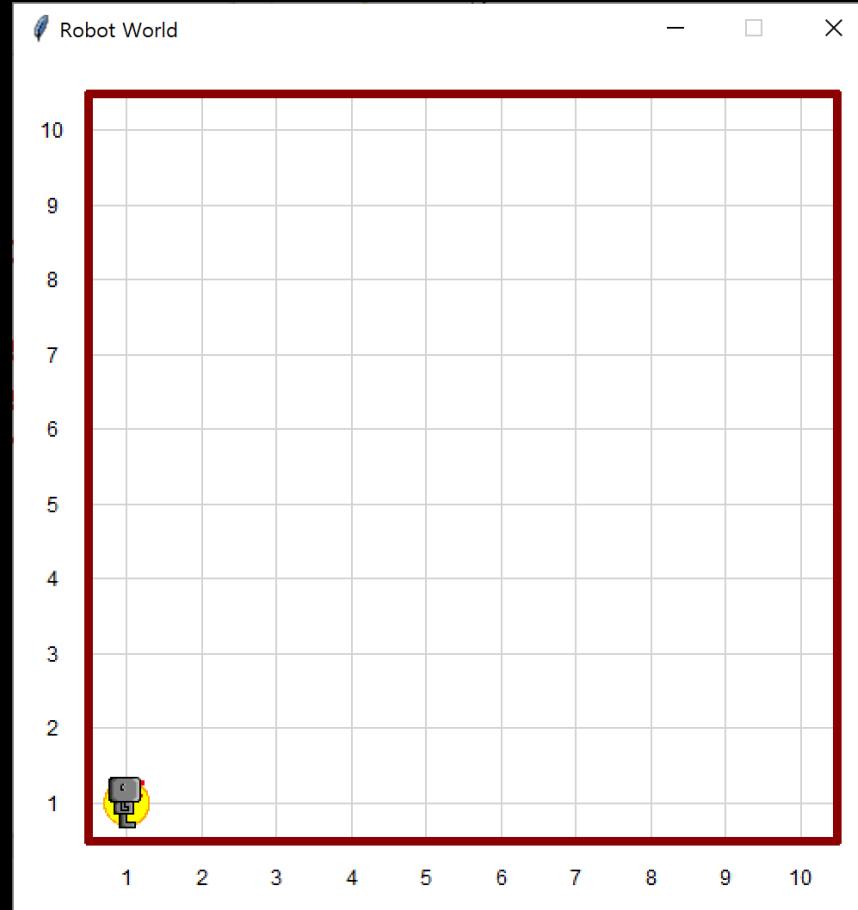
```
create_world()
```

```
hubo = Robot(beepers=10)
```

```
hubo.set_trace('blue')
```

```
hubo.drop_beeper()
```

# Robot\_2



# Robot\_3

```
from cs1robots import *
```

```
create_world()
```

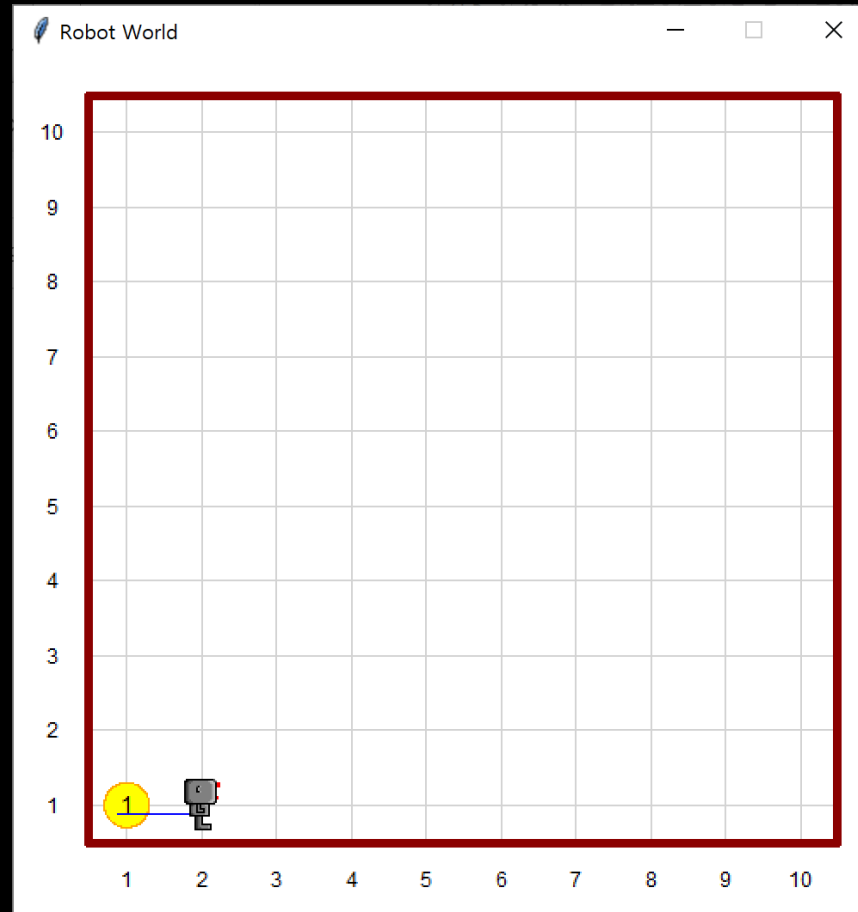
```
hubo = Robot(beepers=10)
```

```
hubo.set_trace('blue')
```

```
hubo.drop_beeper()
```

```
hubo.move()
```

# Robot\_3



# Robot\_4

```
from cs1robots import *
```

```
create_world()
```

```
hubo = Robot(beepers=10)
```

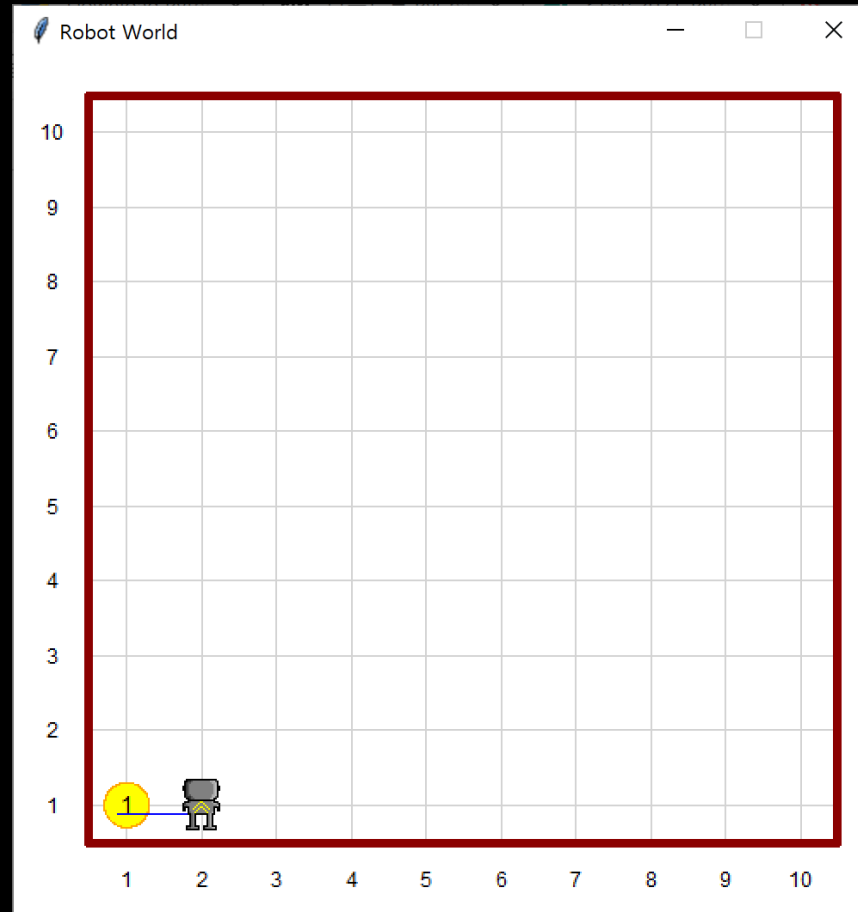
```
hubo.set_trace('blue')
```

```
hubo.drop_beeper()
```

```
hubo.move()
```

```
hubo.turn_left()
```

# Robot\_4: turn\_left



# Robot\_5

```
from cs1robots import *
```

```
create_world()
```

```
hubo = Robot(beepers=10)
```

```
hubo.set_trace('blue')
```

```
hubo.drop_beeper()
```

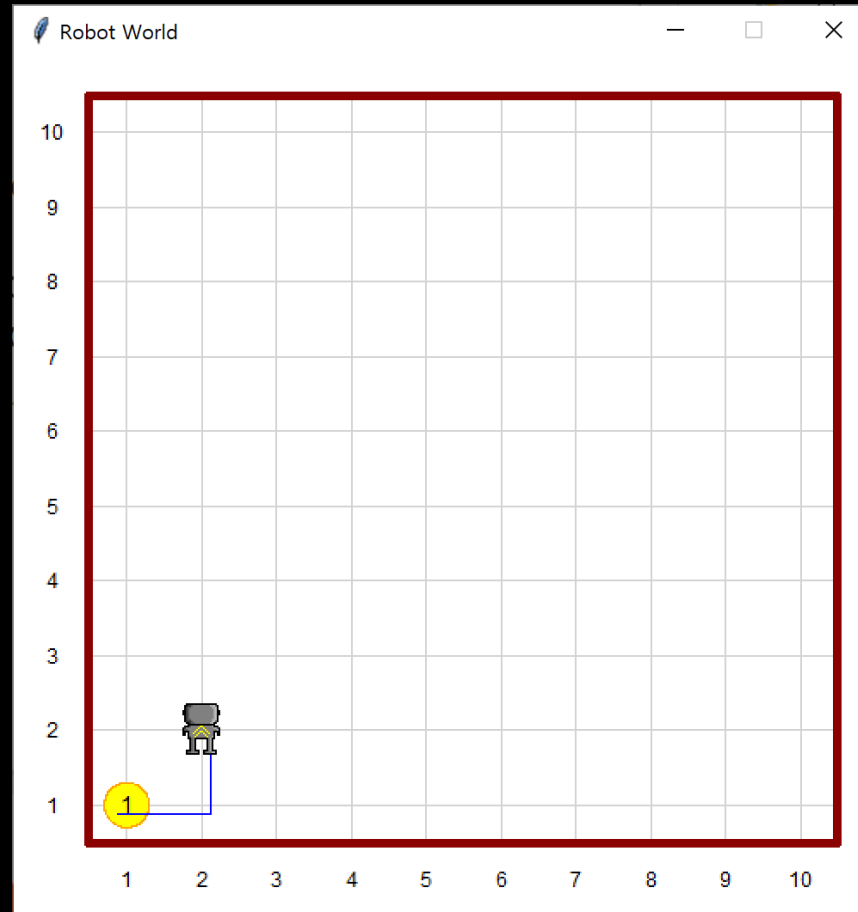
```
hubo.move()
```

```
hubo.turn_left()
```

```
hubo.move()
```



# Robot\_5



# Robot\_6

```
from cs1robots import *
```

```
create_world()
```

```
hubo = Robot(beepers=10)
```

```
hubo.set_trace('blue')
```

```
hubo.drop_beeper()
```

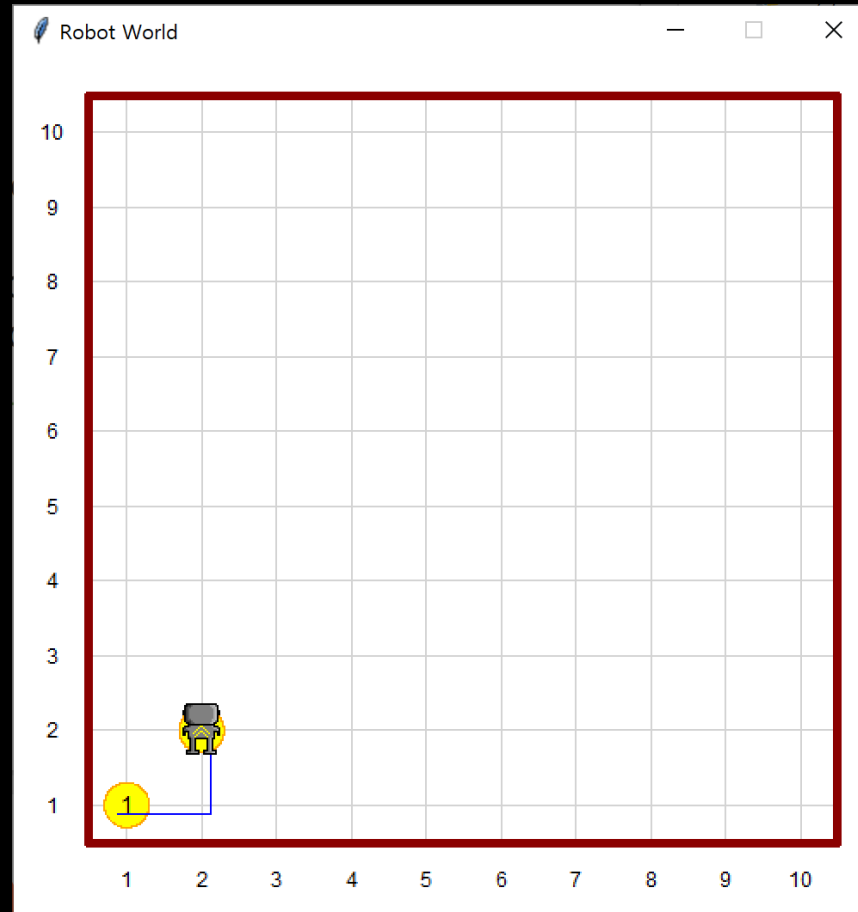
```
hubo.move()
```

```
hubo.turn_left()
```

```
hubo.move()
```

```
hubo.drop_beeper()
```

# Robot\_6



# Robot\_7

```
from cs1robots import *
```

```
create_world()
```

```
hubo = Robot beepers=10)
```

```
hubo.set_trace('blue')
```

```
hubo.drop_beeper()
```

```
hubo.move()
```

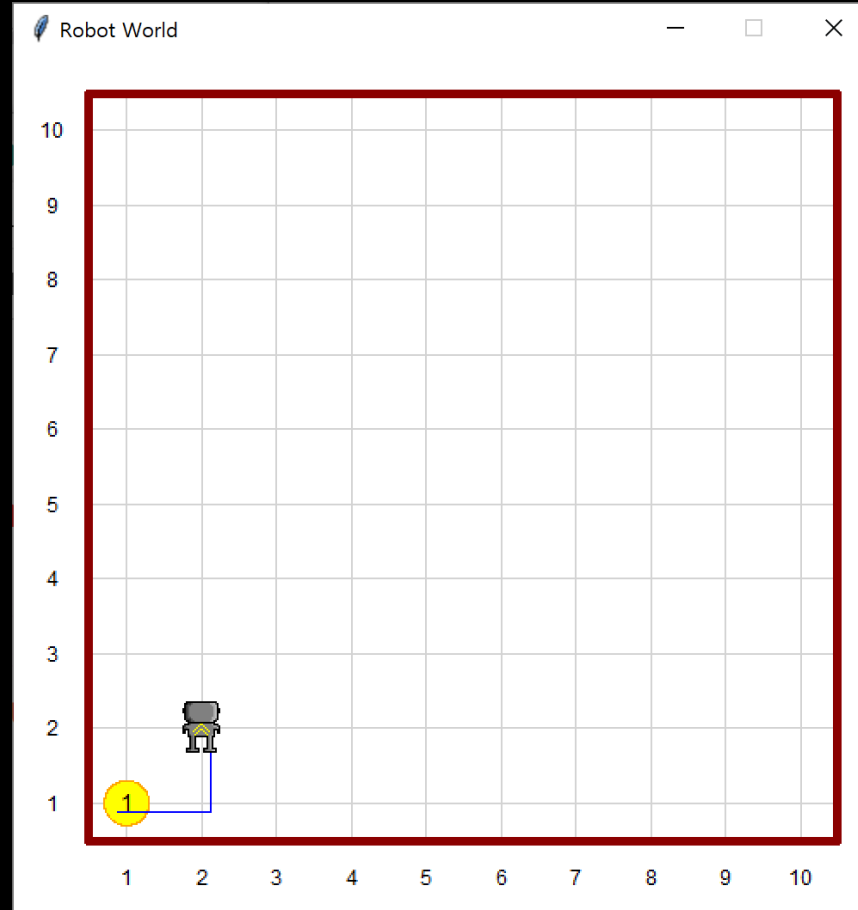
```
hubo.turn_left()
```

```
hubo.move()
```

```
hubo.drop_beeper()
```

```
hubo.pick_beeper()
```

# Robot\_7: on a beeper



# Robot\_8

```
from cs1robots import *
```

```
create_world()
```

```
hubo = Robot(beepers=10)
```

```
hubo.set_trace('blue')
```

```
hubo.drop_beeper()
```

```
hubo.move()
```

```
hubo.turn_left()
```

```
hubo.move()
```

```
hubo.drop_beeper()
```

```
hubo.pick_beeper()
```

```
hubo.pick_beeper()
```

```
C:\Users\suakii\AppData\Local\Programs\Python\Python39\python.exe C:/Users/suakii/PycharmProjects/pythonProject/main.py
```

```
Traceback (most recent call last):
```

```
File "C:\Users\suakii\PycharmProjects\pythonProject\main.py", line 13, in <module>
```

```
    hubo.pick_beeper()
```


```
File "C:\Users\suakii\PycharmProjects\pythonProject\cs1robots.py", line 506, in pick_beeper
```

```
    raise RobotError("I must be on a beeper to pick it up.")
```

```
cs1robots.RobotError: I must be on a beeper to pick it up.
```

```
Close canvas windows to end program.
```

# World

 Copy ×

Copy directory X:\google\_drive\2021\_경기과학고\3\_개인업무 (1)\교내전학공\cs101\worlds

New name:

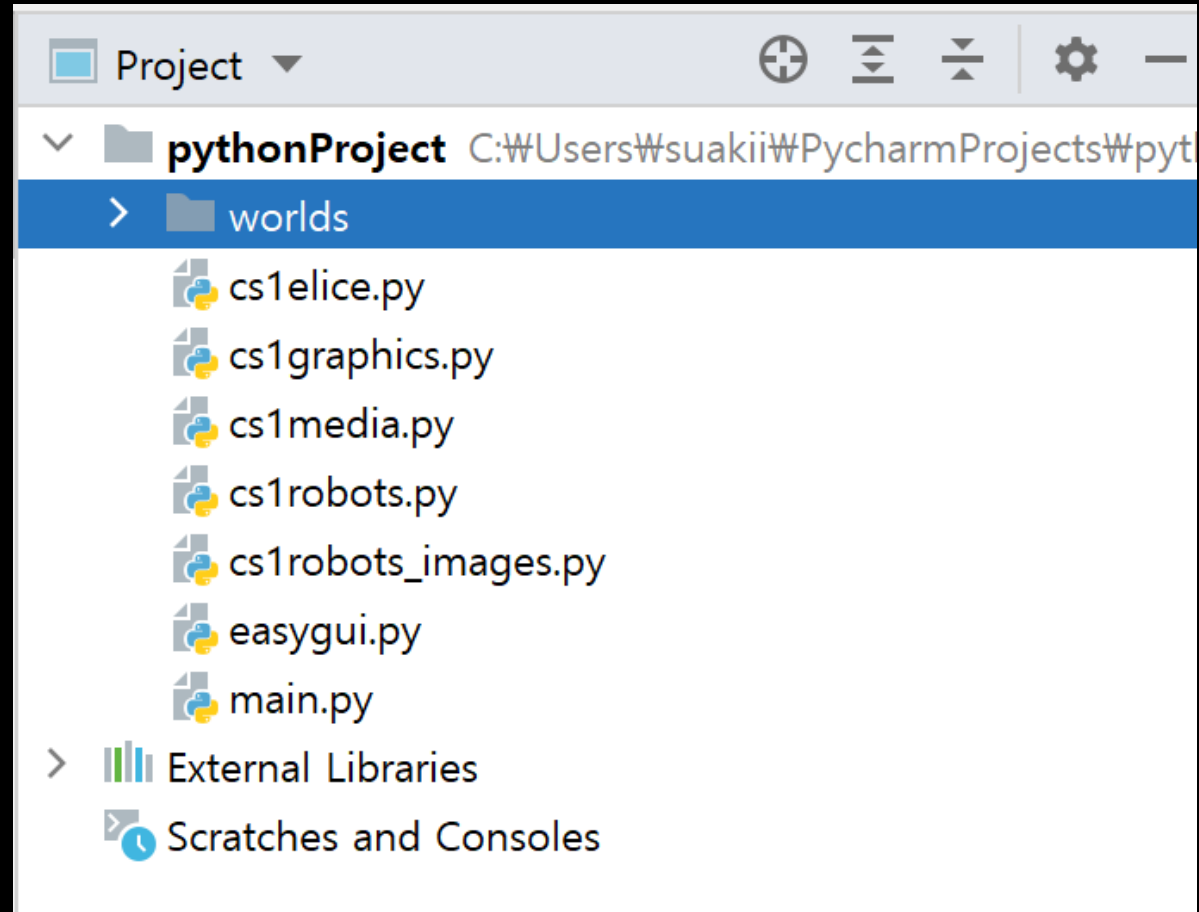
To directory:  ▼ ...

Use Ctrl+Space for path completion

? ☒ Open in editor OK Cancel



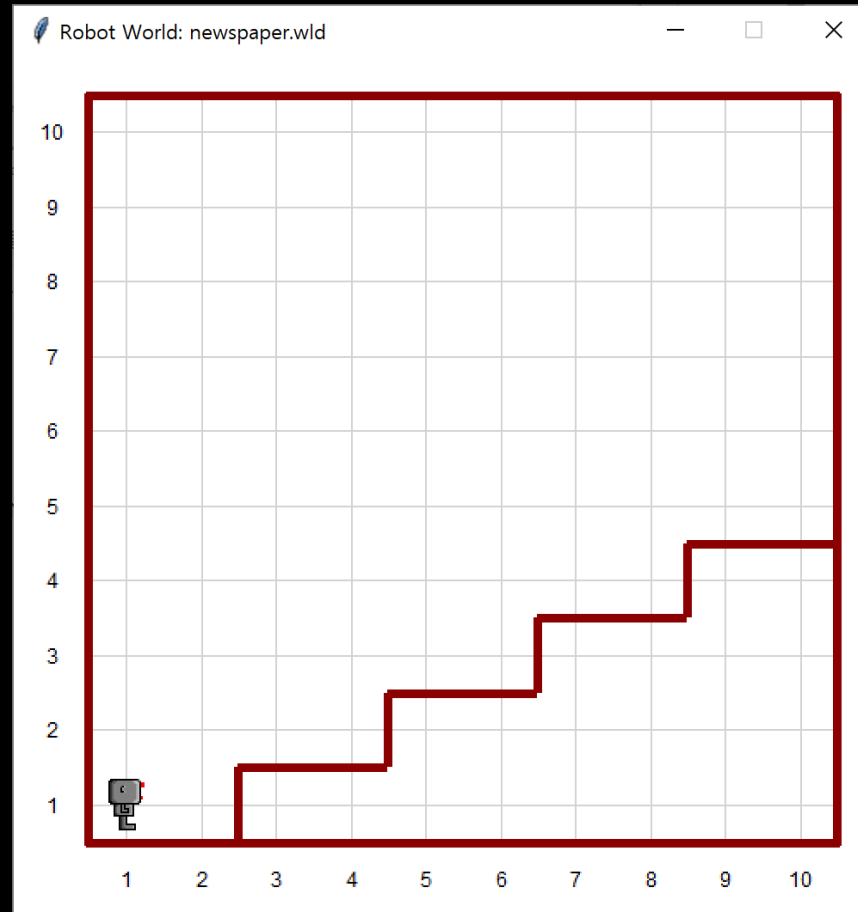
# World Copy



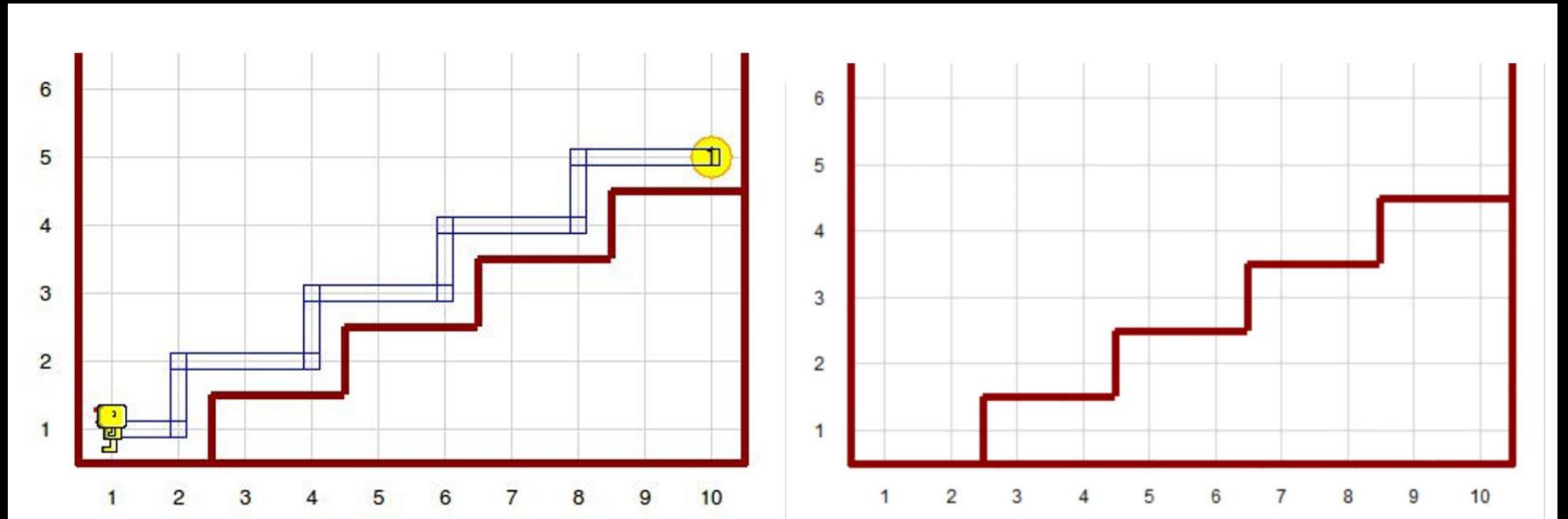
# Newspaper

```
from cs1robots import *  
load_world('worlds/newspaper.wld')  
hubo = Robot()  
hubo.set_trace('blue')
```

# Newspaper



# Object



# Programming

- 4칸 올라가서
- 내려놓고
- 돌아서서
- 다시 4칸 내려간다.

# Turn Right

```
def turn_right():  
    hubo.turn_left()  
    hubo.turn_left()  
    hubo.turn_left()
```

# Turn around

```
def turn_around():  
    hubo.turn_left()  
    hubo.turn_left()
```

# Climb up 1 stair

```
def climb_up_1_stair():  
    hubo.turn_left()  
    hubo.move()  
    turn_right()  
    hubo.move()  
    hubo.move()
```



# Climb up 4 stairs

```
def climb_up_4_stairs():  
    climb_up_1_stair()  
    climb_up_1_stair()  
    climb_up_1_stair()  
    climb_up_1_stair()
```

# All

```
from cs1robots import *
load_world('worlds/newspaper.wld')
hubo = Robot()
hubo.set_trace('blue')

def turn_right():
    hubo.turn_left()
    hubo.turn_left()
    hubo.turn_left()

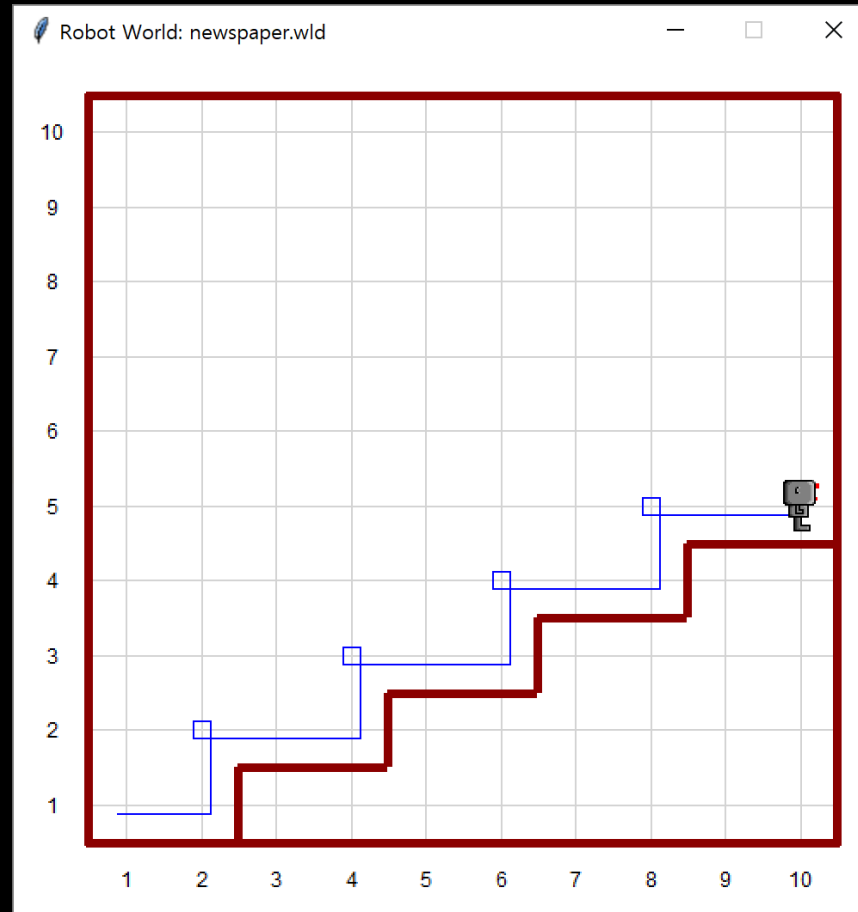
def turn_around():
    hubo.turn_left()
    hubo.turn_left()

def climb_up_1_stair():
    hubo.turn_left()
    hubo.move()
    turn_right()
    hubo.move()
    hubo.move()

def climb_up_4_stairs():
    climb_up_1_stair()
    climb_up_1_stair()
    climb_up_1_stair()
    climb_up_1_stair()

hubo.move()
climb_up_4_stairs()
```

# Your turn :)



# For Loop

# Simple loop

```
for l in range(4):  
    print("GSHS")
```

# for loop

```
def climb_up_4_stairs():  
    for i in range(4):  
        climb_up_1_stair()
```

Thanks