

CSE 1061 Introduction to Computing

Lecture 2 + HW#1

Fall 2015

Department of Computing
The School of EE & Computing



Adama Science & Technology University

Read Sections 5~9 to do following tasks:

Zigzag1*

Hurdles1*

Newspaper delivery

Harvest1

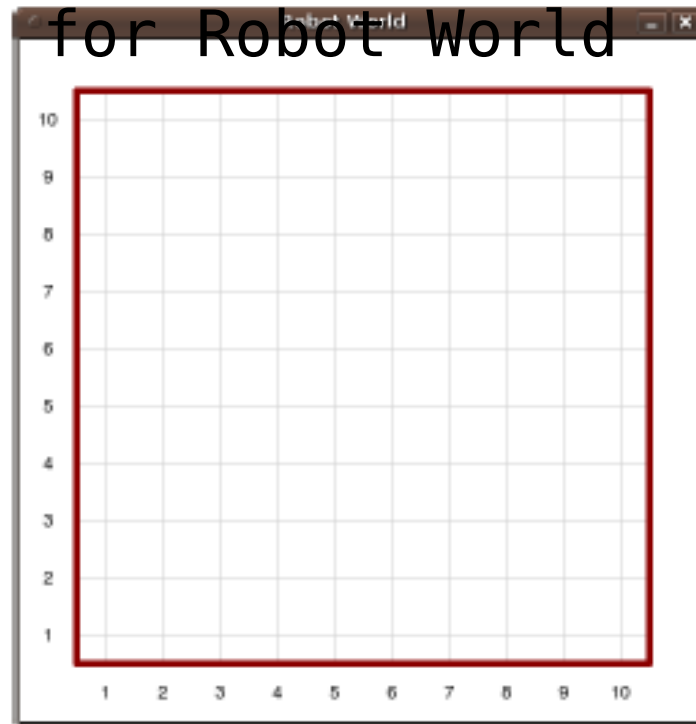
Hurdles2

Harvest2*

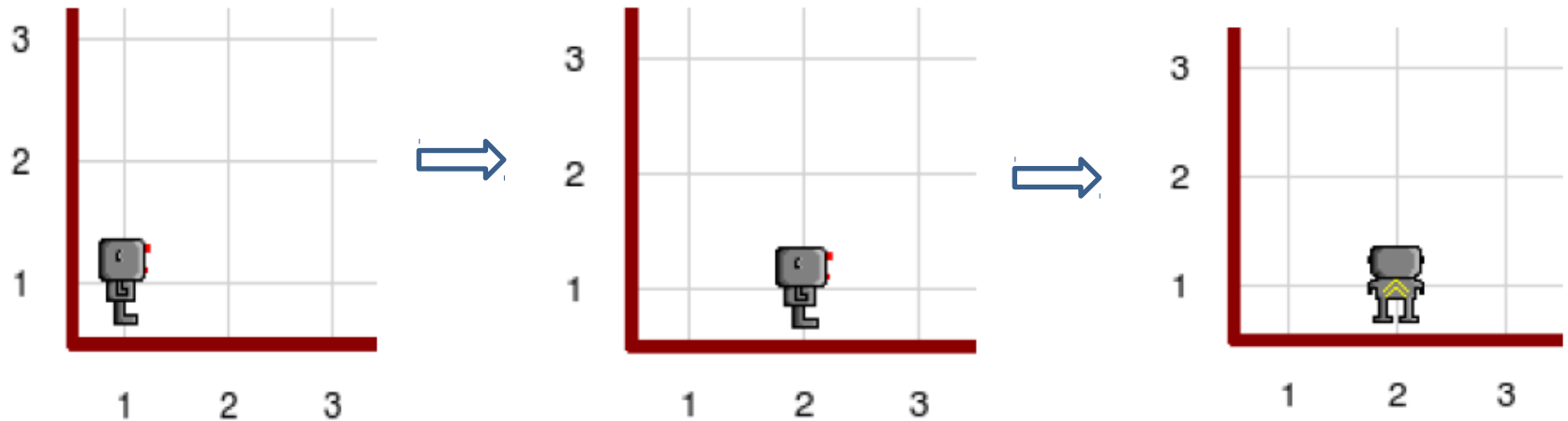
Harvest3

INTERACTIVE MODE (1/2)

```
>>>from cs1robot import *      # prompt >>>
>>>create_world()              # Creates 2D grid
matrix
```



INTERACTIVE MODE (2/2)

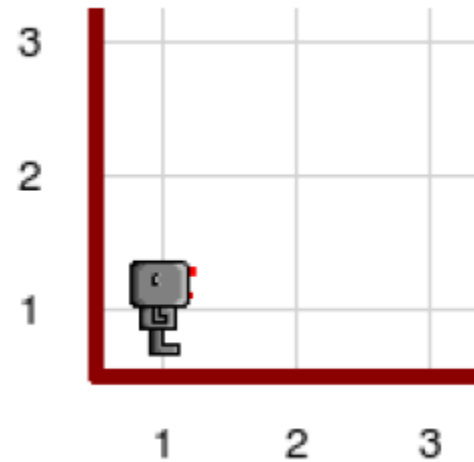


```
>>>hubo =  
Robot()
```

```
>>>hubo.move()  
e()
```

```
>>>hubo.turn_  
left
```

```
from cs1robots import *  
create_world()  
hubo = Robot()  
hubo.move()  
hubo.turn_left()  
hubo.move()  
hubo.turn_left()  
hubo.move()  
hubo.turn_left()  
hubo.move()  
hubo.turn_left()
```



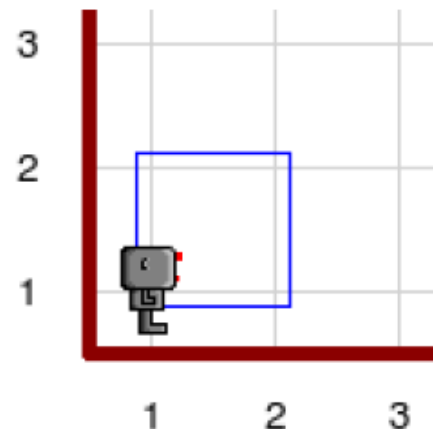
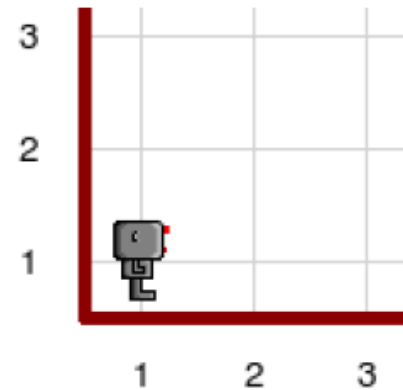
Why ?

TRACE & PAUSE

```
from cs1robots import *  
create_world()  
hubo = Robot()
```

```
hubo.set_trace('blue')  
hubo.set_pause(2)
```

```
hubo.move()  
hubo.turn_left()  
hubo.move()  
hubo.turn_left()  
hubo.move()  
hubo.turn_left()  
hubo.move()  
hubo.turn_left()
```



BUGS

Hubo.mMove() **Syntax error !**

```
from cs1robots import *
```

```
create_world()
```

```
hubo = Robot()
```

```
hubo.move()
```

```
hubo.turn_left()
```

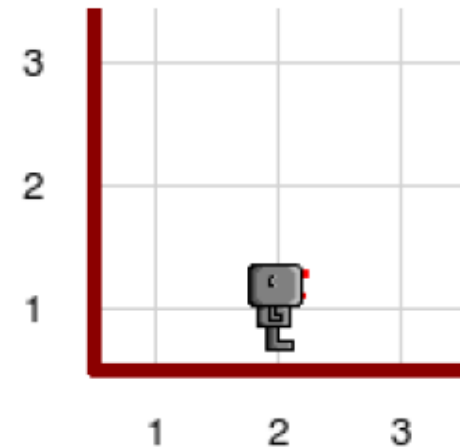
```
hubo.turn_left()
```

```
hubo.turn_left()
```

```
hubo.move()
```

Runtime error !

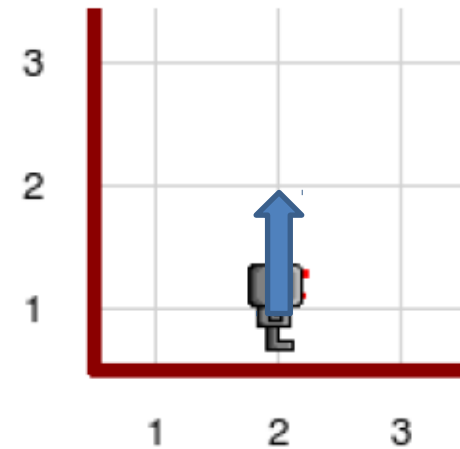
What's wrong ?



BUGS

Hubo.mMove() **Syntax error !**

```
from cs1robots import *  
create_world()  
hubo = Robot()  
hubo.move()  
hubo.turn_left()  
hubo.turn_left()  
hubo.turn_left()  
hubo.move()
```



BUGS

Hubo.mMove() **Syntax error !**

```
from cs1robots import *
```

```
create_world()
```

```
hubo = Robot()
```

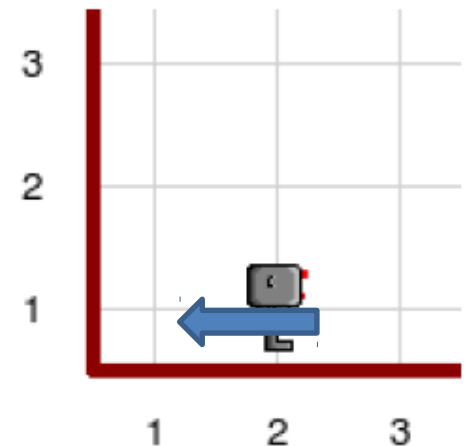
```
hubo.move()
```

```
hubo.turn_left()
```

```
hubo.turn_left()
```

```
hubo.turn_left()
```

```
hubo.move()
```



BUGS

Hubo.mMove() **Syntax error !**

```
from cs1robots import *
```

```
create_world()
```

```
hubo = Robot()
```

```
hubo.move()
```

```
hubo.turn_left()
```

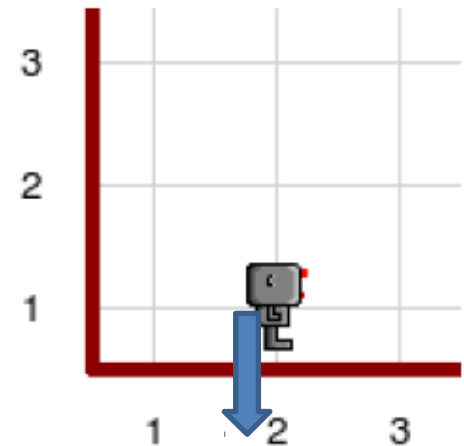
```
hubo.turn_left()
```

```
hubo.turn_left()
```

```
hubo.move()
```

Runtime error !

What's wrong ?



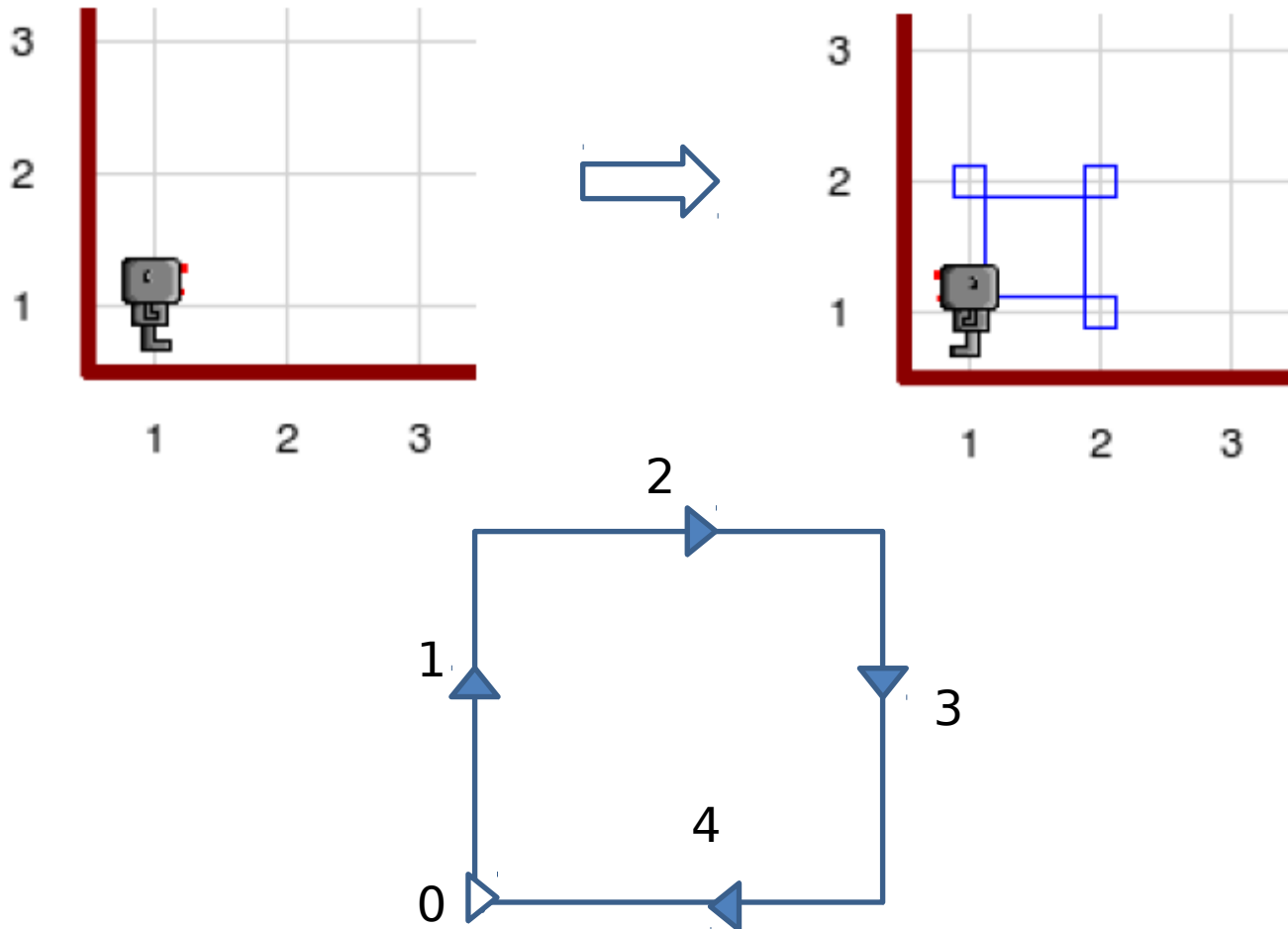
COMMENTS

- Used for other humans inside a program
 - To embed programmer-readable **annotations**.
 - To make the source code easier to understand.
- **Starting with #**
- **Ignored by the Python interpreter:**

```
# My first program
from cs1robots import *
create_world()

# This line should be ignored!
```

TURNING RIGHT (1/3)



TURNING RIGHT (2/3)



initialize the world

```
from cs1robots import *  
create_world()  
hubo = Robot()
```

turn left

```
hubo.turn_left()
```

 Why?

move and turn right

```
hubo.move()
```

```
hubo.turn_left()
```

```
hubo.turn_left()
```

right

```
hubo.turn_left()
```

turn

move and turn right

```
hubo.move()
```

```
hubo.turn_left()
```

```
hubo.turn_left()
```

```
hubo.turn_left()
```

turn right

move and turn right

```
hubo.move()
```

```
hubo.turn_left()
```

```
hubo.turn_left()
```

turn right

```
hubo.turn_left()
```

```
hubo.move()
```

TURNING RIGHT (3/3)

```
from cs1robots import  
create_world()  
hubo = Robot()
```

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

```
hubo.turn_left()
```

```
# turn right and move  
hubo.move()  
turn_right()
```

```
# turn right and move
```

```
hubo.move()
```

```
turn_right()
```

```
# turn left and move
```

```
hubo.move()
```

```
turn_right()
```

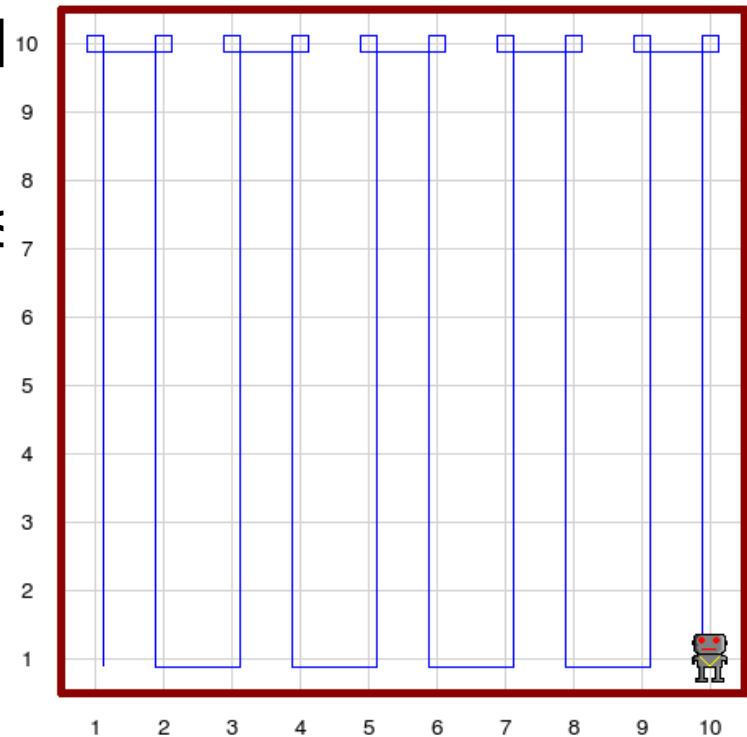
```
hubo.move()
```

PRACTICE USING FUNCTIONS 1 ASTU

PROBLEM 1: ZIGZAG1*

Write a program *zigzag.py* that makes your robot visit the entire world in a zigzag fashion.

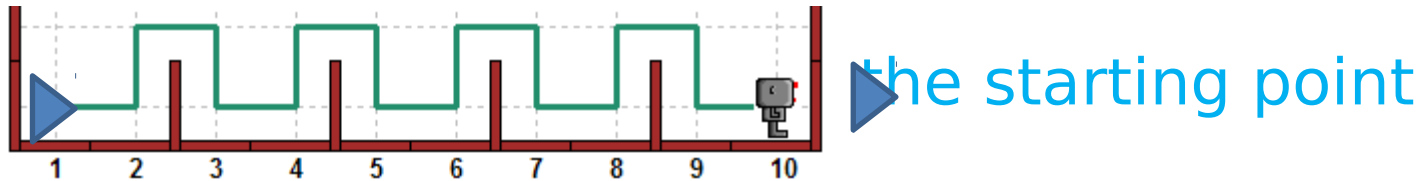
Analyze the zigzag path and use the functions to make your program as compact as possible.





PROBLEM2: HURDLES1*

Hubo has entered a hurdles race with obstacles as in the world file *hurdles1*. Write a program that makes Hubo follow the path indicated below in his way to picking up a beeper, which is at grid(10,1).



Again, make your program as compact as possible using functions.

HOW TO LOAD HURDLES1



ASTU

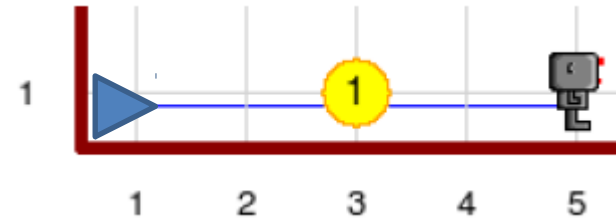
```
from cs1robots import *  
load_world("worlds/hurdles1.wld") #but not  
create_world()  
hubo = Robot()
```

directory hurdle1 file

Create a directory worlds and download all world files.

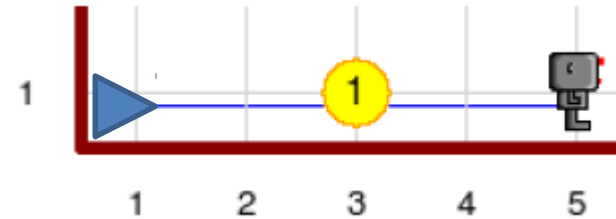
DROPPING A BEEPER

```
from cs1robots import  
load_world("worlds/hurdles1.wld")  
hubo = Robot beepers = 1  
hubo.set_trace("blue")  
hubo.move()  
hubo.move()  
hubo.drop_beeper()  
hubo.move()  
hubo.move()
```



PICKING A BEEPER

```
from cs1robots import *  
load_world("worlds/hurdles1.wld")  
hubo = Robot(beepers = 1)  
hubo.set_trace("blue")  
hubo.move()  
hubo.move()  
hubo.pick_beeper()  
hubo.move()  
hubo.move()
```



PRACTICE USING FUNCTIONS 3 ASTU

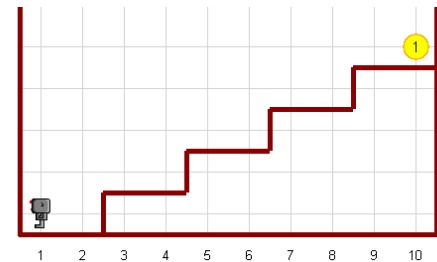
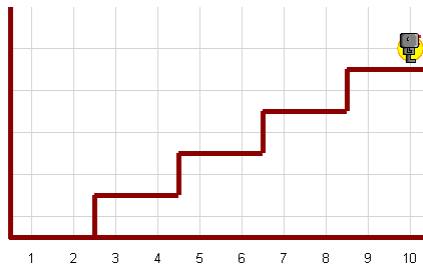
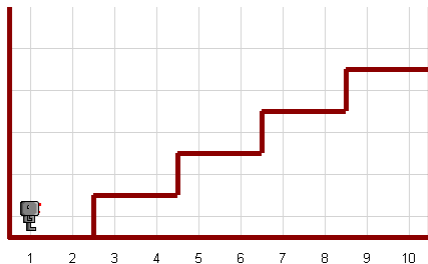
PROBLEM 3: NEWSPAPER DELIVERY

Hubo delivers newspapers in his local neighborhood.

Make him climb the stairs to the front door of a house,

drop the newspaper (represented by a beeper) on the top step, and return to his starting point as illustrated below.

The world file is newspaper.wld.

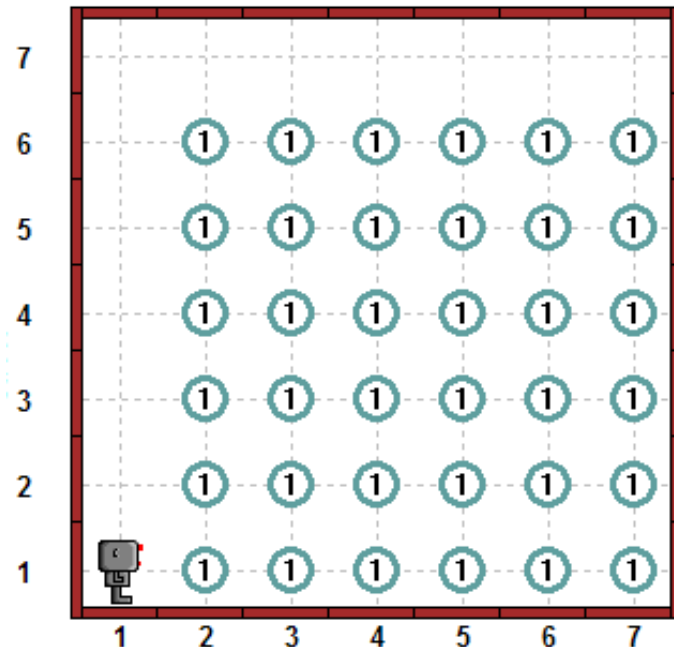


Use top-down design: As already explained in the previous lecture, decompose the problem into sub-problems and then focus on each sub-problem one by one.

PRACTICE USING FUNCTIONS 4 ASTU

PROBLEM 4: HARVEST1

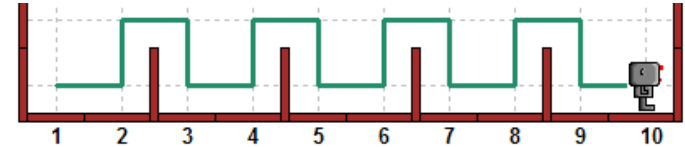
It's harvest time! Make the robot pick up all the carrots (represented by beepers) in this garden. The world file is harvest1.wld. Employ top-down design. Use while-loop.



PRACTICE WITH FOR-LOOPS

PROBLEM 5 : HURDLES2*

Do Hurdles1 using for-loops.



Homework 1 for Week 1:

Write a program which does

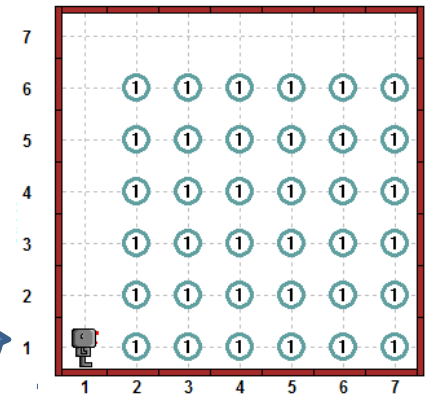
the following problem 6 and 7:

due date: 1 week from next Lab.

Submit to: ykchung99@gmail.com

Submission method:

- your source program-file (with your id & name)
- e-mail or Lab-assistant using USB memory



HW1-1) PROBLEM 6: HARVEST2

- Do Harvest1 using for-loops.

HW 1-2) PROBLEM 7: HARVEST3

- Load "worlds/harvest2.wld"
- Pick up all beepers in this map?

