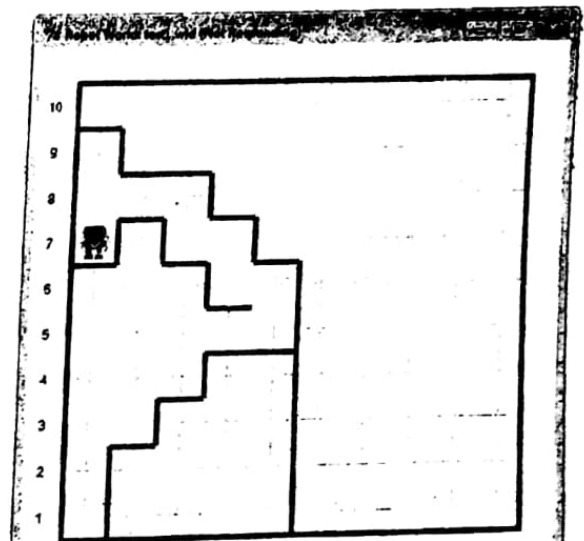
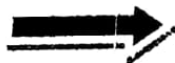
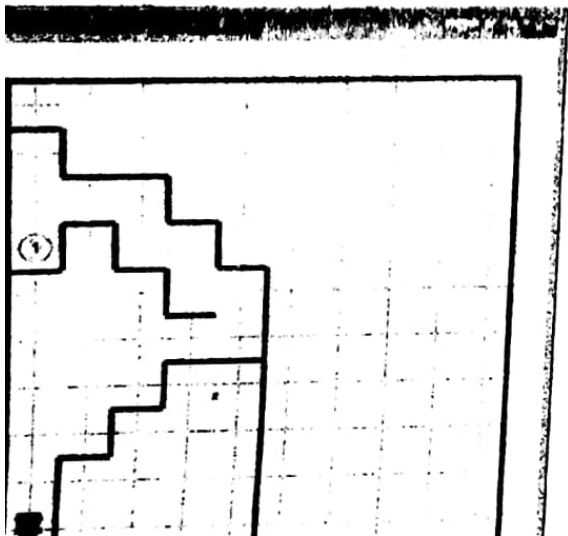
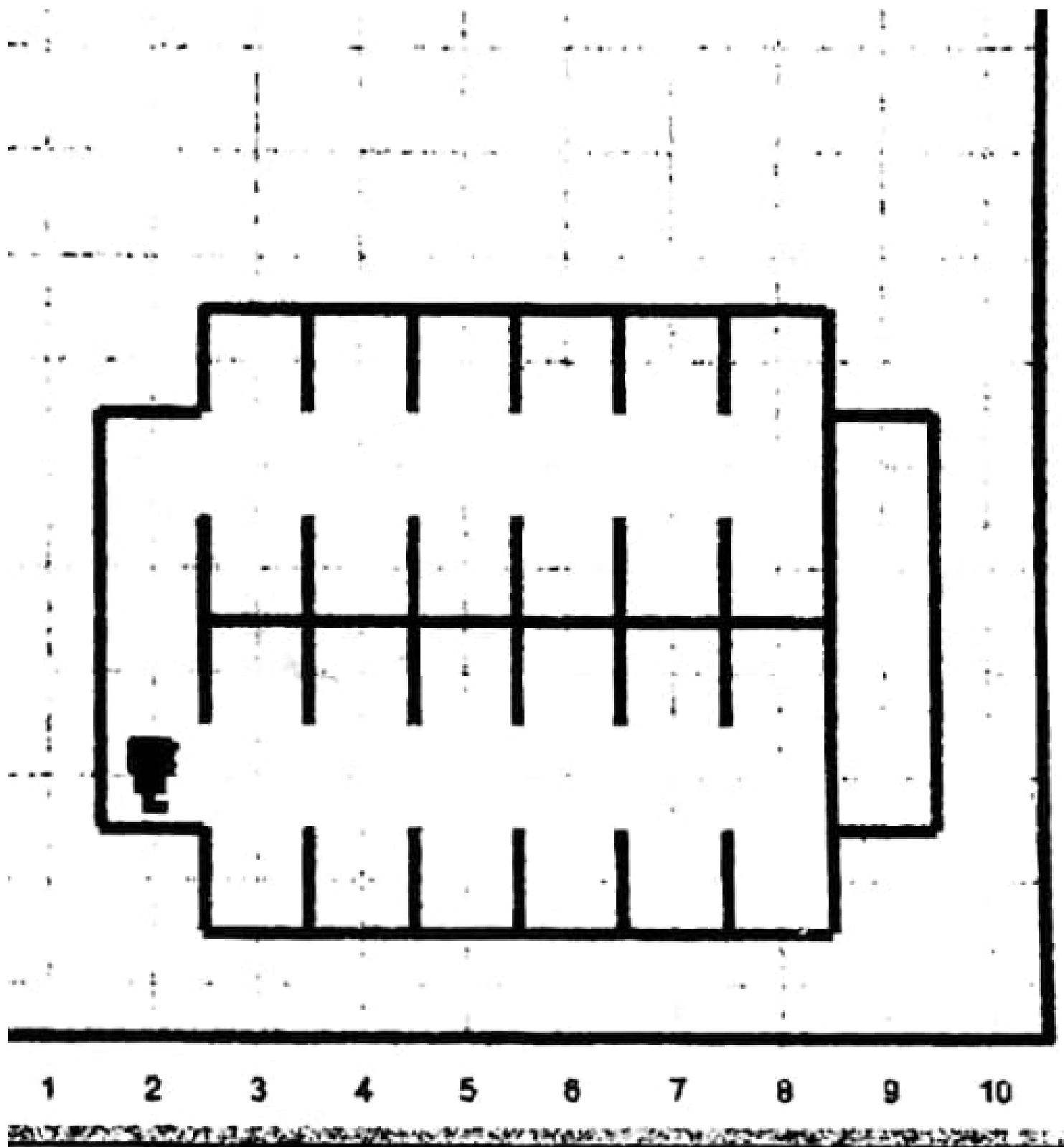
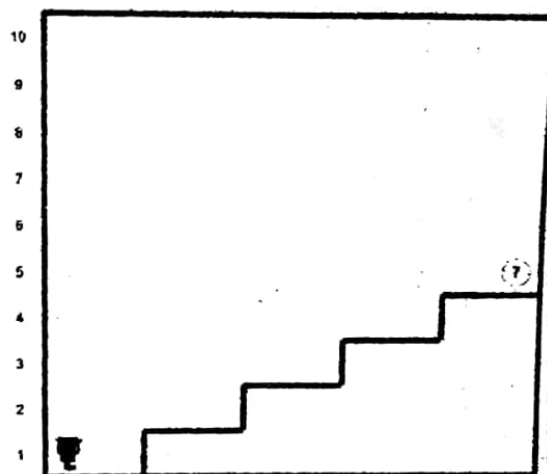
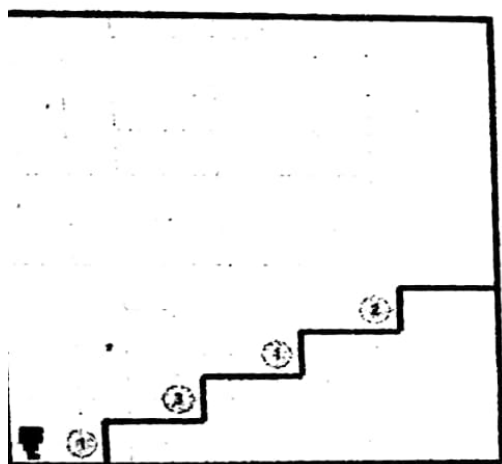






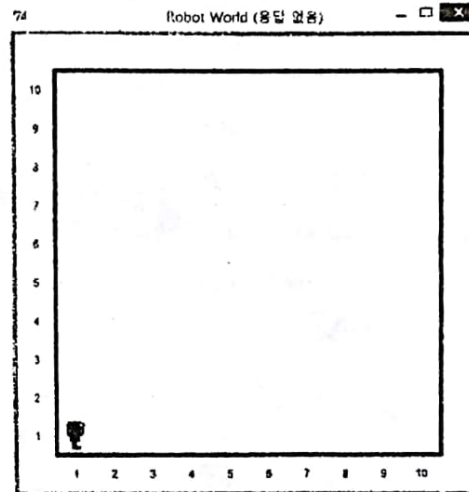
Given the world in the left side,



Introduction to Computing Mid-Exam 2008 E.C.

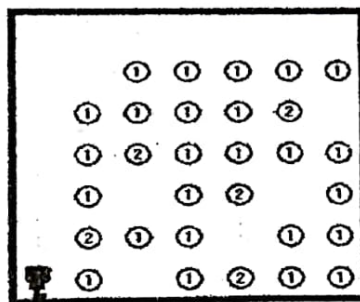
(20 pts) Write the output of the following code on the world figure given next to this code.

```
from cs1robots import *
create_world()
abc=Robot(beepers=50)
while not abc.on_beeper():
    for i in range(5):
        abc.drop_beeper()
        abc.move()
    abc.turn_left()
```

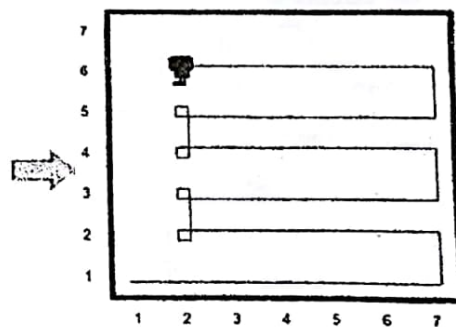


<figure> the world figure

2. (20 pts) The input data is as the figure in the left figure. Write pseudo codes or Python program which make the robot move as the following right figure after the program is executed.



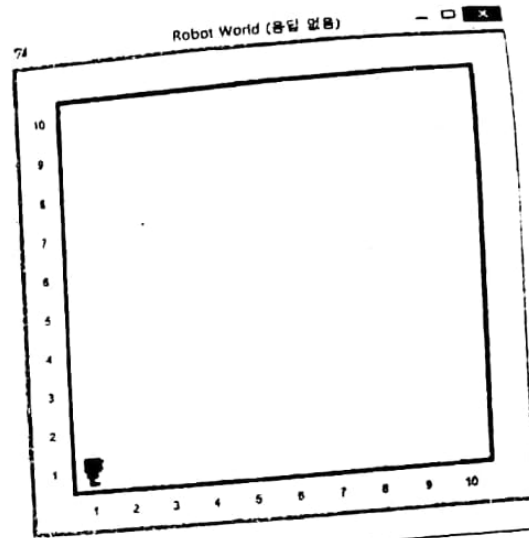
<starting of a robot>



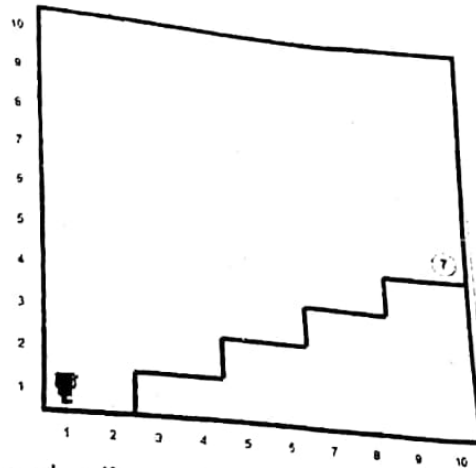
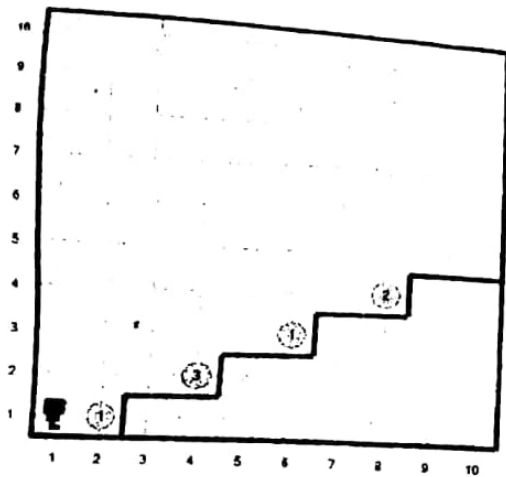
< end of a robot movements>

3 (20 pts) Optimize the following python program code, by modifying it using possible programming elements. Write the answer in the box. (Hint: the final code will have the same purpose as the original and smaller number of rows)

```
from cs1robots import *
create_world()
hubo=Robot()
hubo.set_trace("blue")
hubo.set_pause(0.2)
hubo.move()
hubo.move()
hubo.turn_left()
hubo.move()
hubo.move()
hubo.turn_left()
hubo.move()
hubo.move()
hubo.turn_left()
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hubo.move()
hubo.move()
hubo.turn_left()
hubo.move()
hubo.move()
hubo.turn_left()
hubo.move()
hubo.move()
```



4. (20 pts) Given the world in the left side,



Write a program that makes the robot to **climb** and **collect all beepers** and keep them at position (10,5) finally the robot returns back to its initial position(1,1) as shown in the right.

Introduction to Computing

(20 pts) Write the output of the following code on the

```
from cs1robots import *
create_world()
abc=Robot beepers=50
while not abc.on_beeper():
    for i in range(5):
        abc.drop_beeper()
        abc.move()
    abc.turn_left()
```

74

10

9

8

7

6

5

4

3

2

1

2. (20 pts) The input data is as the figure in the left figure. Write a program which make the robot move as the following right

Name _____ ID _____ Group _____

3. write a program that check if a number is odd or even using function

ID 1102 4277/09

Group 23

Name Abraham

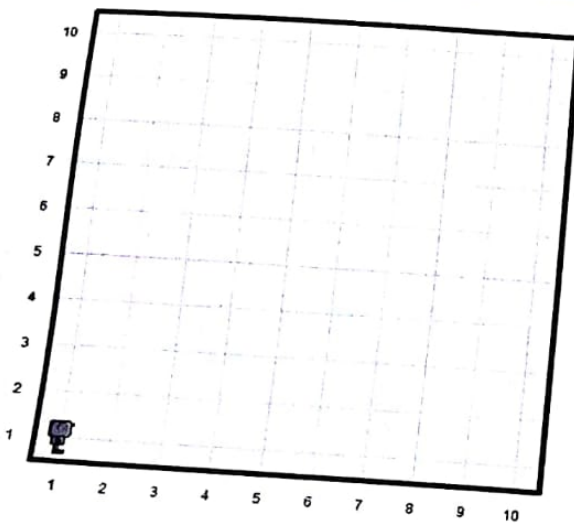
Adama Science and Technology University
School of Electrical Engineering and Computing
Computer Science and Engineering Program-CSE
Computational Thinking Quiz One

Instruction :

1. Answer the following questions clearly and neatly.
2. Use function, conditional, and or loop when necessary
3. Use meaningful variable and function naming

1. Write a program to create a world of default size which is 10x10 as shown below

World before the program executes



World after the program executes

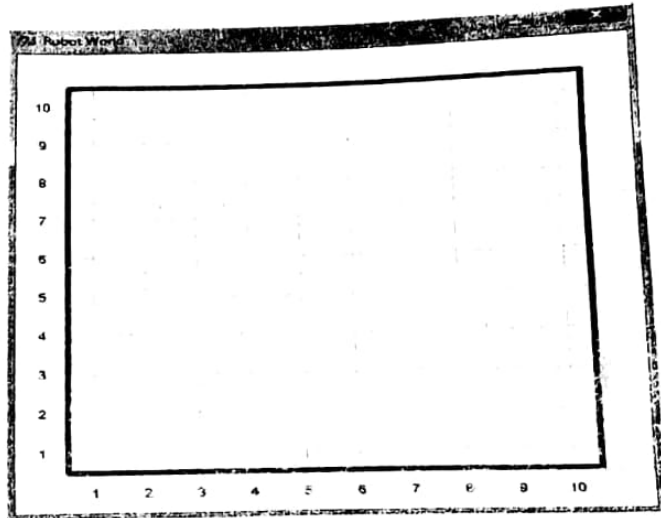


1. Write a Def function by the name **triangle_area** which accepts **height** and **width** of **triangle** as arguments from the caller and **return** area of **triangle** to the caller and display it. **Read height and width of the triangle from the keyboard.**

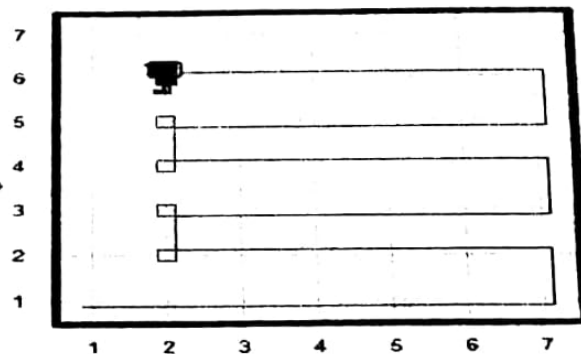
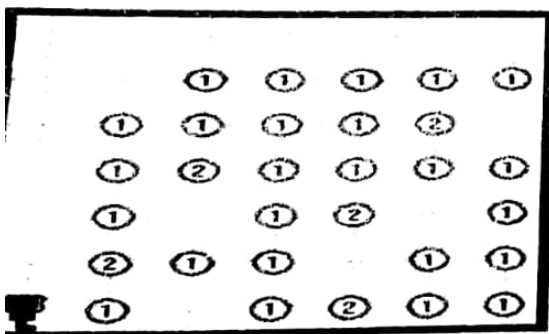
Hint: $\text{area} = 1/2(\text{height} * \text{width})$

2. Write the output of the following code on the world figure given next to this code.

```
from cs1robots import *
create_world()
hubo=Robot(avenue=2,street=3,beepers=50)
hubo.set_trace("blue")
while not hubo.on_beeper():
    for i in range(4):
        hubo.drop_beeper()
        hubo.move()
        hubo.move()
    hubo.turn_left()
```



3. The input data is as in the left figure. Write pseudo codes and python program which make the robot move as the following right figure after the program is executed.

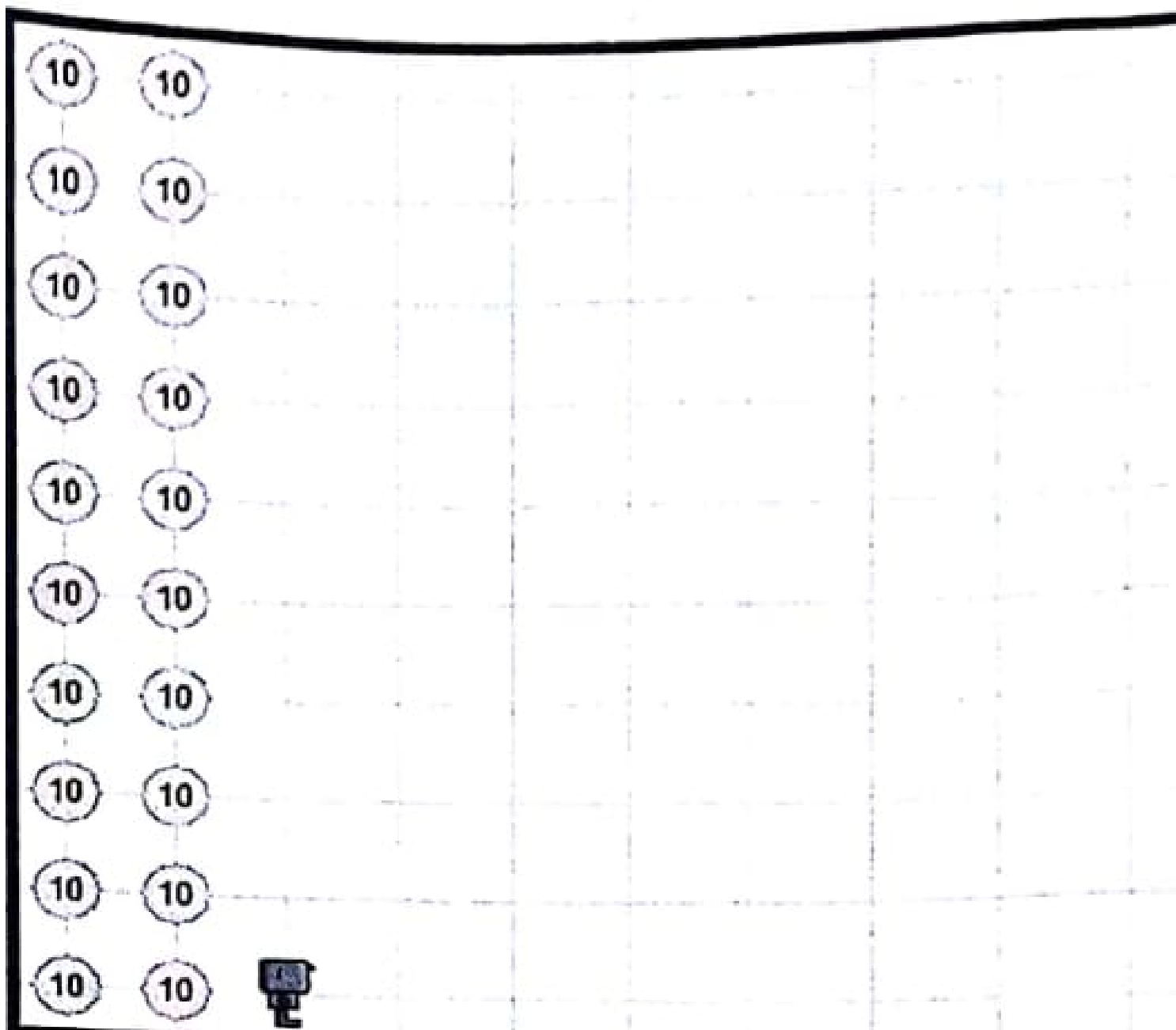


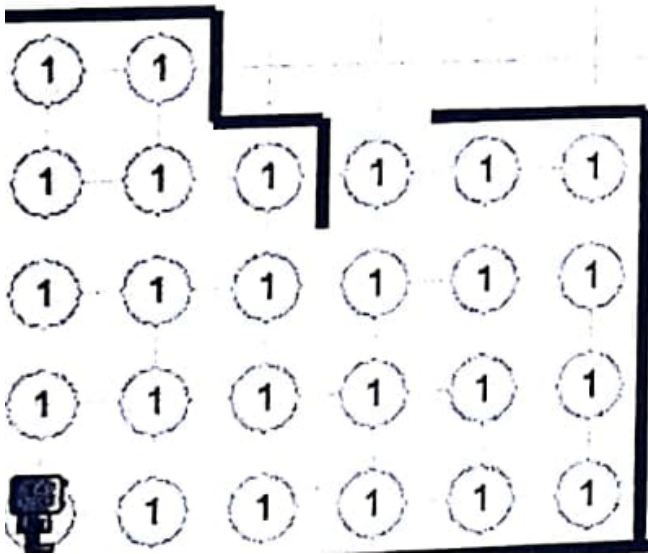
Show the position of the robot where

hubo=Robot(avenue=6,street=7,orientation="W")

8



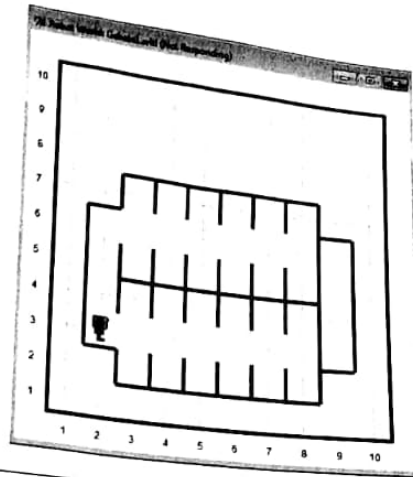




```

from cs1robots import *
load_world("Gebeta1.wld")
h=Robot(bepers=3,avenue=2,street=3)
h.set_trace("blue")
h.set_pause(0.2)
def turn(n):
    for i in range(n):
        h.turn_left()
def play():
    if h.right_is_clear():
        turn(3)
        h.move()
    elif h.front_is_clear():
        h.move()
    elif h.left_is_clear():
        turn(1)
        h.move()
    else:
        turn(2)
        h.drop_beeper()
    h.move()
while h.carries_bepers():
    play()

```



Questions:

- ① (10) How many times does the play() function gets called in the program's lifecycle?
Support your answer with justification:

- ② (10) When the program stops from running, what will be the standing point coordinate[written as (avenue,street)] and the orientation [face direction written as 'N','S','W', or 'E'] of the robot?

Standing point : _____ Orientation: _____

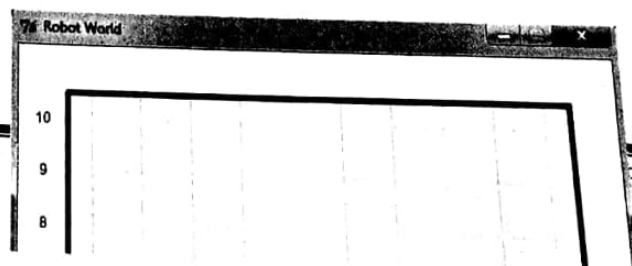
- ③ (5) What will be the coordinate and Orientation of the robot if the number of beepers that the robot carries was initially 5 ?

Standing point : _____ Orientation: _____

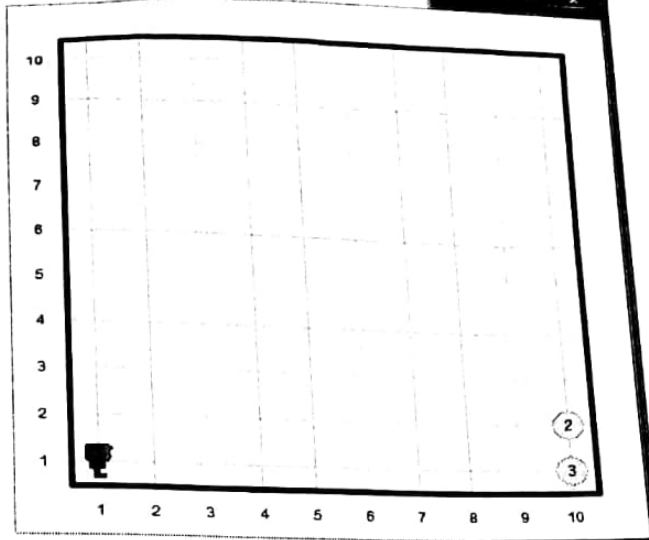
3. (15) Write the output of the following code on the world figure given next to this code.

```
from cs1robots import *
```

[Type text]



74 Robot World: add1.wld (Not Responding)




```

create_world()
abc=Robot(avenue=3,street=3,beepers=50)
while not abc.on_beeper():
    for i in range(7):
        abc.drop_beeper()
        abc.move()
    abc.turn_left()

```

<figure> the world figure

4. (25) Convert the following code for - loop statement using while - statement.
And what will be the output of the following program codes:

```

For i in range(7):
    print "*" * i

```

5. (25) Write a pseudo code (algorithm) that solves the following problem
Problem: help hobo collect the beepers and return back to its starting point in the world shown below

For pre-eng. — 465

465

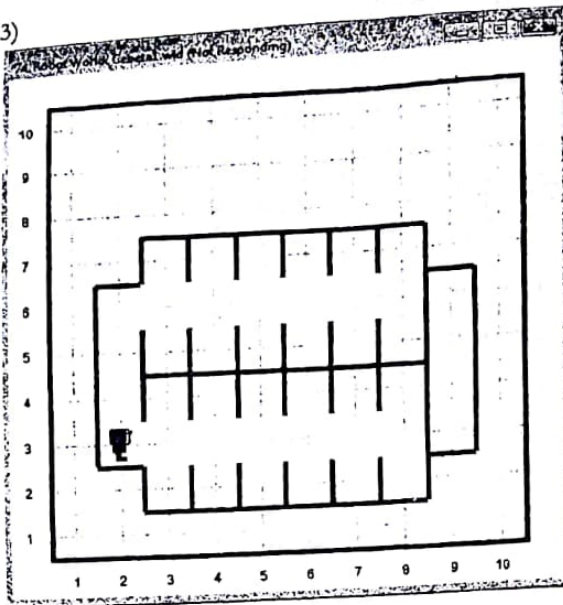
1. (25) Consider the Pythagorean Theorem to find the distance between two points. A user enters the coordinates (x_1, y_1) and (x_2, y_2) as input point data. Compute the distance between two points and print out the distance, where, $\text{distance} = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

- a. (10) Write a pseudo code to solve this problem?
- b. (15) Write python program that generate the distance given two points (3,4) and (9,12) ?
(Hint: use function)

2. (25) **Output Question:** Consider the following python code and the world "Gebeta1.wld" and answer the questions that follow:

5. (20 pts) **Output Question:** Consider the following python code and its output. "Gebeta1.wld" and answer the questions that follow:

```
from cs1robots import *
load_world("Gebeta1.wld")
h=Robot(bepers=3,avenue=2,street=3)
h.set_trace("blue")
h.set_pause(0.2)
def turn_right():
    for i in range(3):
        h.turn_left()
def turn_around():
    for i in range(2):
        h.turn_left()
def play():
    if h.right_is_clear():
        turn_right()
        h.move()
    elif h.front_is_clear():
        h.move()
    elif h.left_is_clear():
        h.turn_left()
        h.move()
    else:
        turn_around()
        h.drop_beeper()
```



Questions:

- ① (10 pts) How many times does the play() function gets called in the program's lifecycle?

Support your answer with justification:

- ② (10 pts) When the program stops from running, **what will be the standing point coordinate [written as (avenue,street)] and the orientation** [face direction written as 'N','S','W', or 'E'] of the robot?

Standing point : _____ Orientation: _____