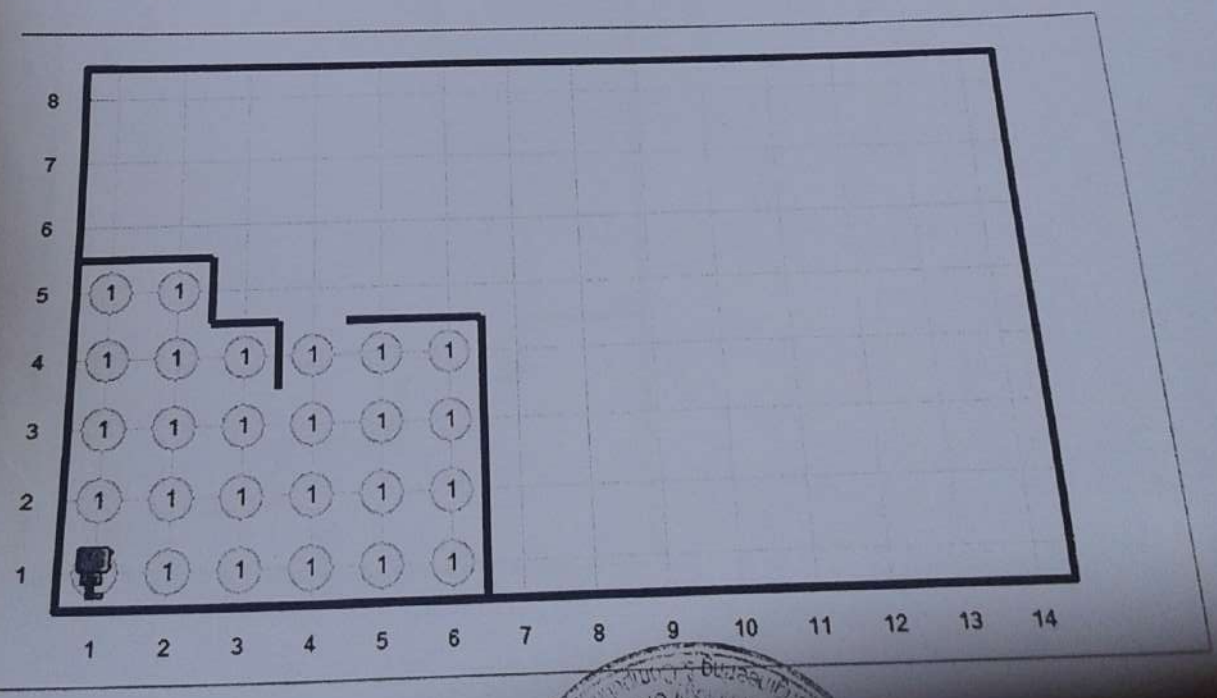
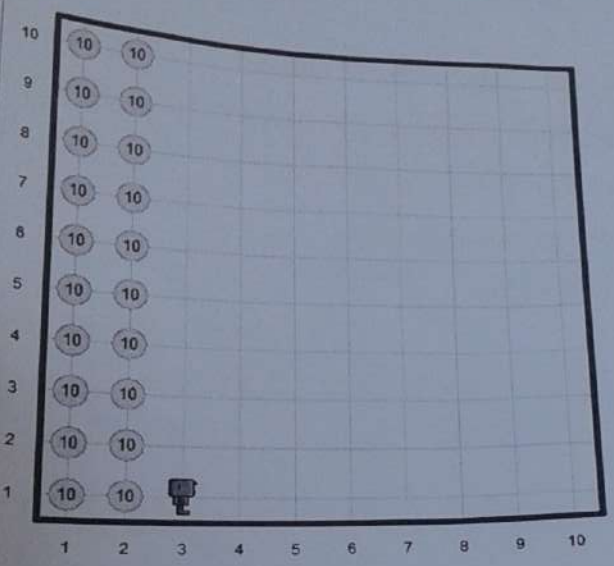
Name_____ ID_____ Group_____

Output world

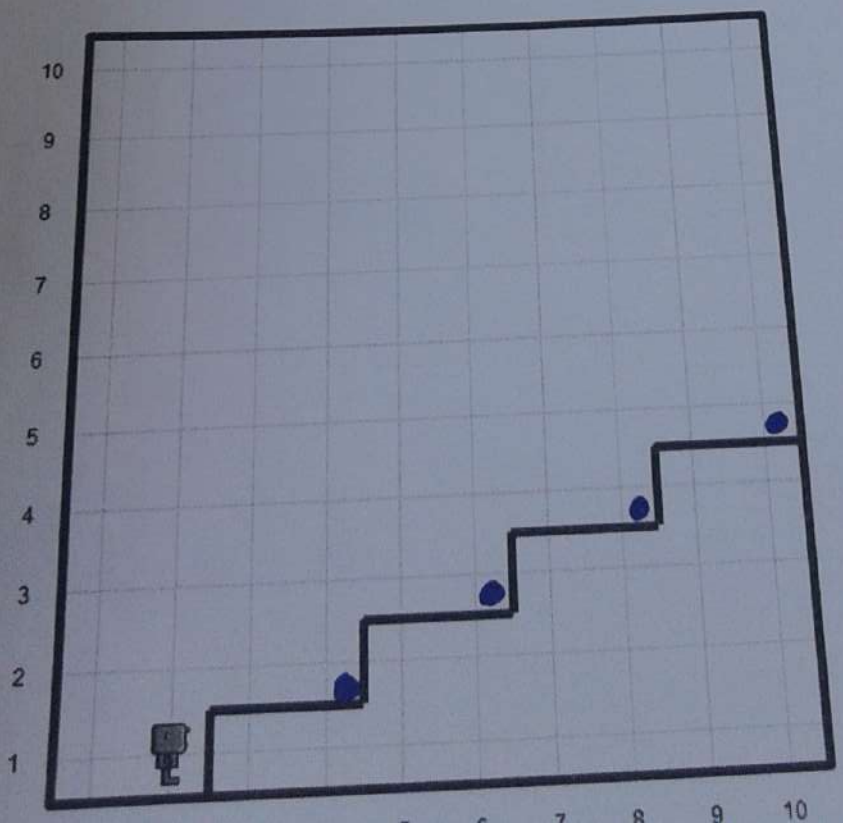


Name_____

ID_____Group_____



2. Write a program that to help the robot deliver news paper

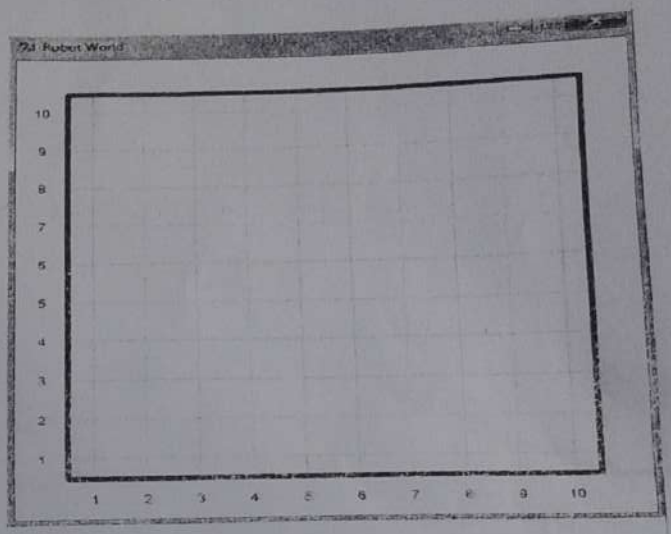


1. Write a Def function by the name **triengle_area** which accepts **height** and **width** of **triangle** as arguments from the caller and **return** area of **triangle** to the caller and display it. **Read height and width of the triangle from the keyboard.**

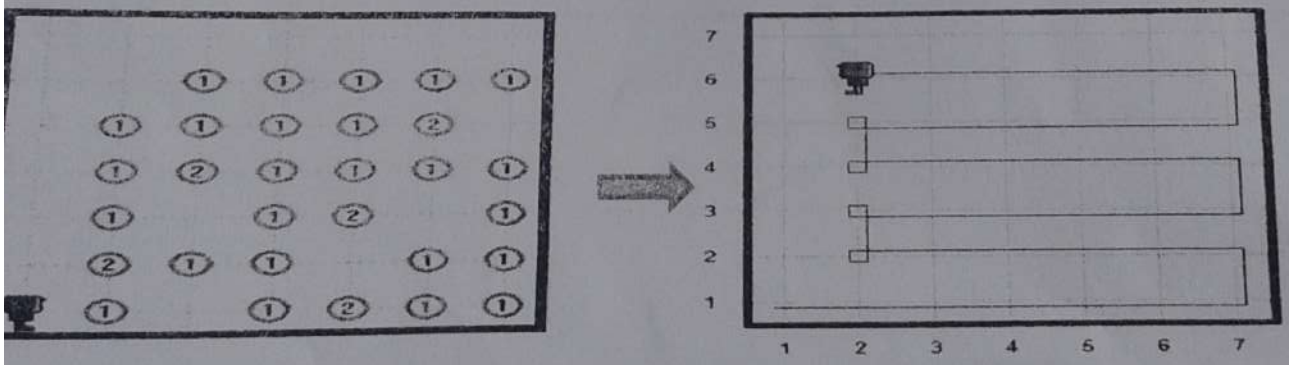
   Hint: area=1/2(height * width)

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()
```

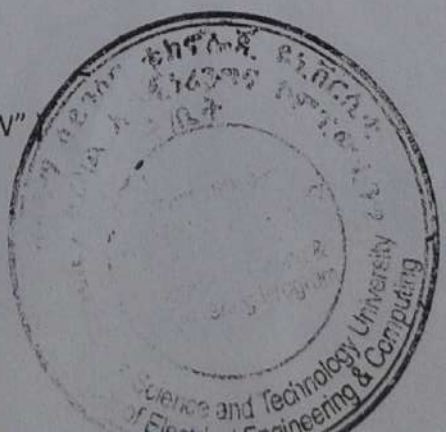


3. The input data is as in the left figure. **Write pseudo codes and python program** which make the robot move as the following right figure after the program is executed.



Show the position of the robot where

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



Name [redacted] ID [redacted] Group 23

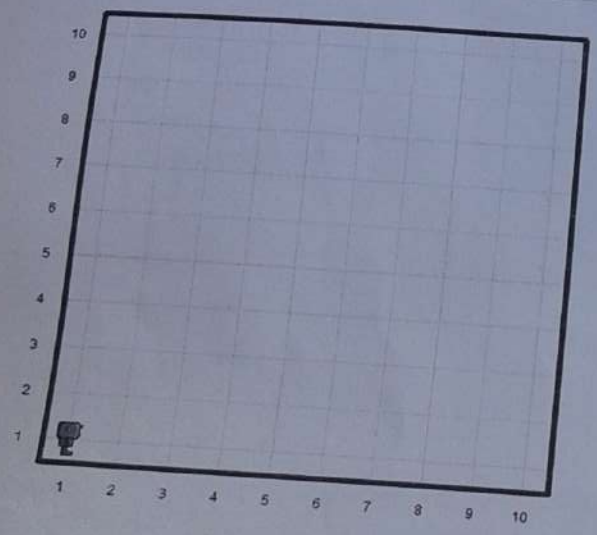
Adama Science and Technology University
School of Electrical Engineering and Computing
Computer Science and Engineering Program-CSE
Computational Thinking Quiz One

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

Name_____ ID_____ Group_____

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

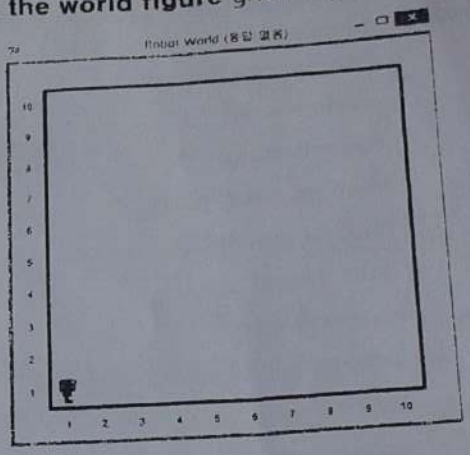
456

2008E.C.

Introduction to Computing Mid-exam

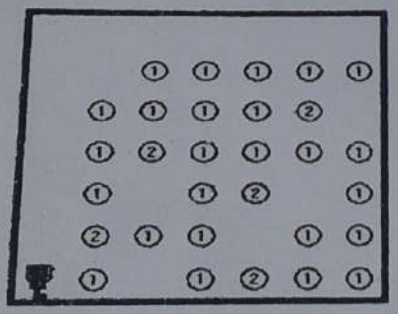
(20 pts) **Write the output** of the following code **on the world figure** given next to this code.

```
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()
```

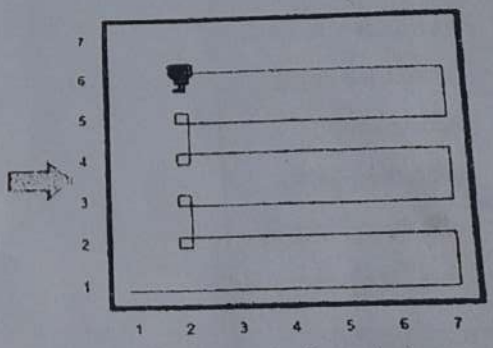


<figure> the world figure

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.

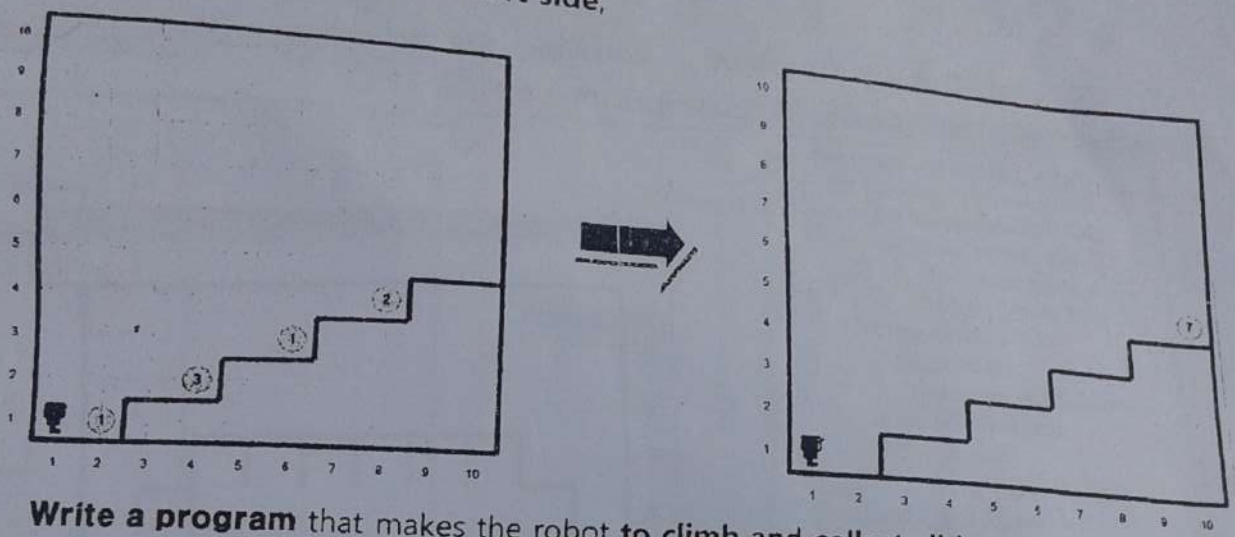


<starting of a robot>



< end of a robot movements>

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

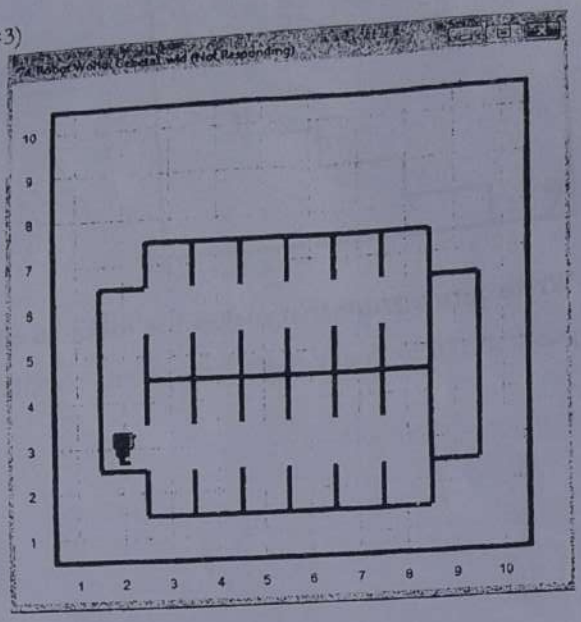


Write a program that makes the robot **to climb and collect all beepers** and keep them at position (10,5) finally the robot returns back to its initial position(1,1) as shown in the right.

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

```
from cs1robots import *
load_world("Gebeta1.wld")
h=Robot(beepers=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()

h.move()
while h.carries_beepers():
    play()
```



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: _____

For Pre-eng. — 465

465

1. **(25)** Consider the Pythagorean Theorem to find the distance between two points. A user enters the coordinates $(x1, y1)$ and $(x2, y2)$ as input point data. Compute the distance between two points and print out the distance, where, distance$=\sqrt{(x2-x1)+(y2-y1)}$

   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" anc answer the questions that follow:

```
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()
```

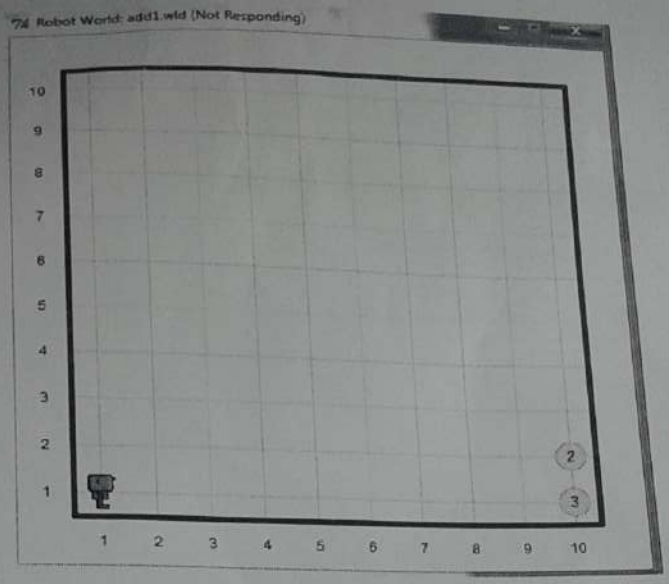
<figure> the world figure

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
```

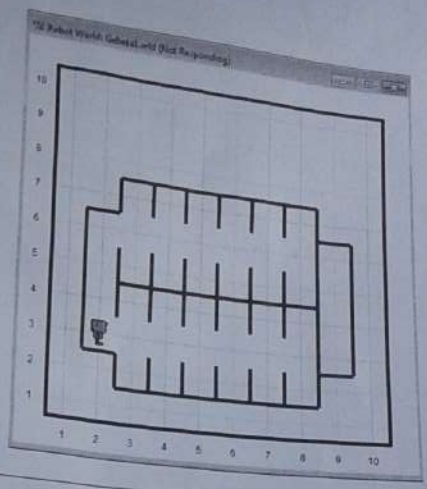
5. (25) Write a pseudo code (algorithm) that solves the following problem

Problem: help hobo collect the beepers and return back to its starting point in the world shown bellow


Robot World: add1.wld (Not Responding)
10
9
8
7
6
5
4
3
2
1
1
2
3
4
5
6
7
8
9
10
2
3

```
from cs1robots import *
load_world("Gebeta1.wld")
h=Robot(beepers=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_beepers():
    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?

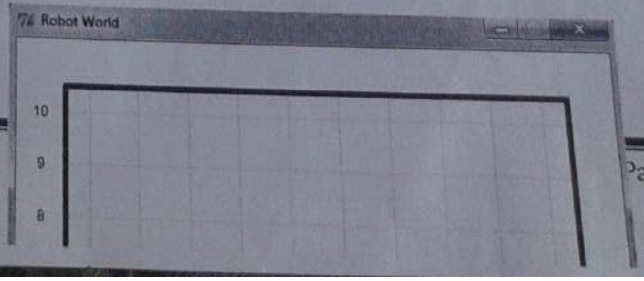
Standing point : _____Orientation: _____

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: _____

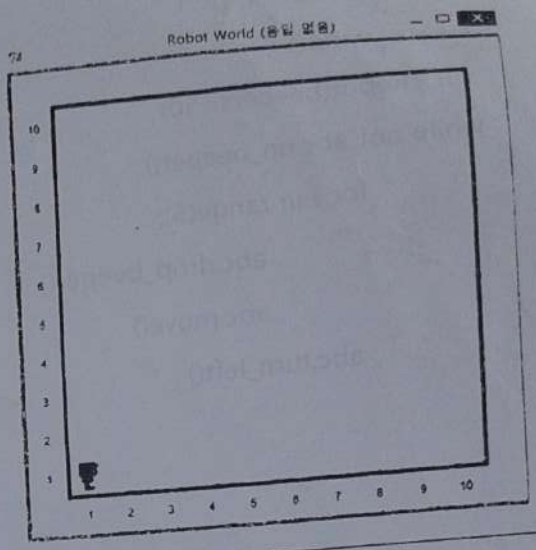
3. (15) Write the output of the following code **on the world figure** given next to this code.

```
from cs1robots import *
```



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)

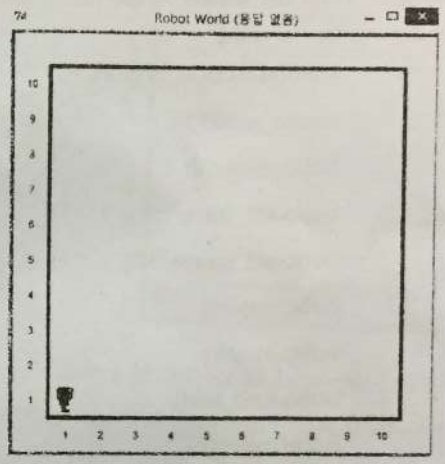
```
from cs1robots import *
create_world()
hubo=Robot()
hubo.set_trace("blue")
hubo.set_pause(0.2)
hubo.move()
hubo.move()
hubo.turn_left()
hubo.move()
hubo.move()
hubo.turn_left()
hubo.move()
hubo.move()
hubo.turn_left()
hubo.turn_left()
hubo.turn_left()
hubo.move()
hubo.turn_left()
hubo.turn_left()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



Introduction to Computing Mid-exam 2008E.C.

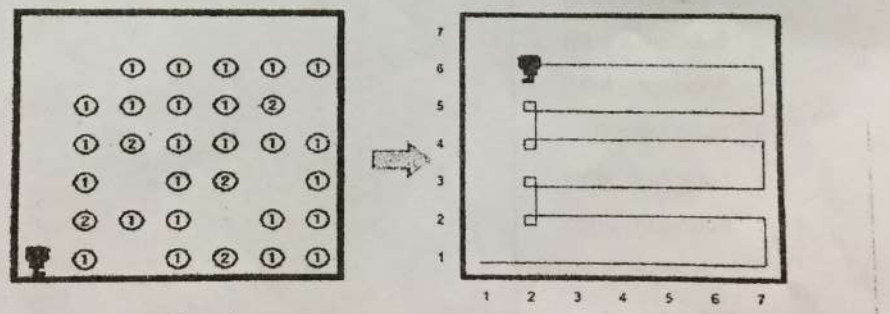
(20 pts) **Write the output** of the following code **on the world figure** given next to this code.

```
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.

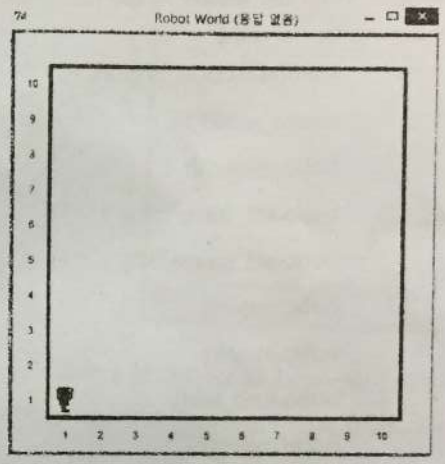


<starting of a robot> < end of a robot movements>

Introduction to Computing Mid-exam 2008E.C.

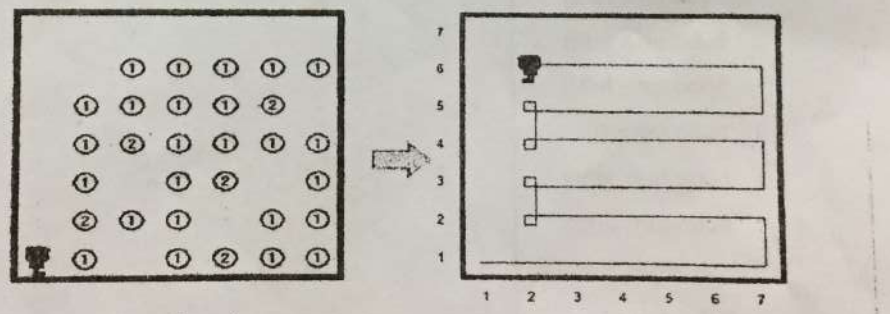
(20 pts) **Write the output** of the following code **on the world figure** given next to this code.

```
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()
```



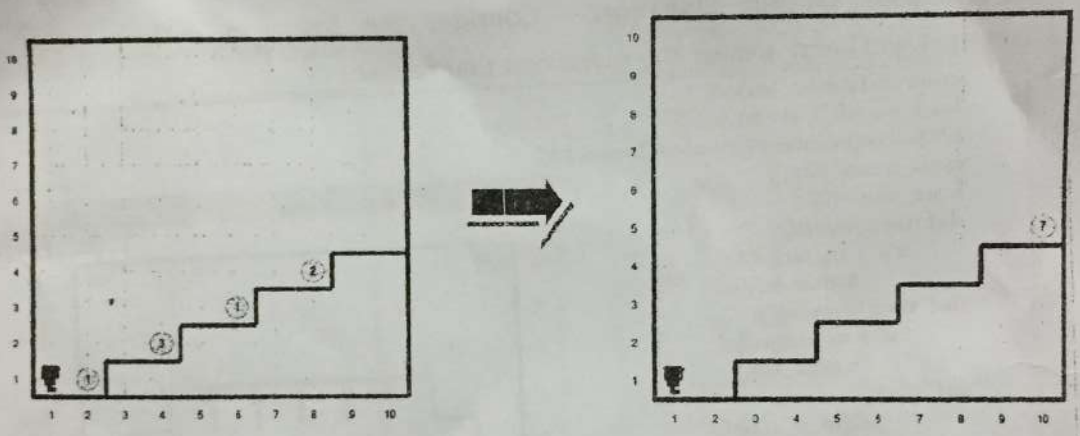
<figure> the world figure

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.



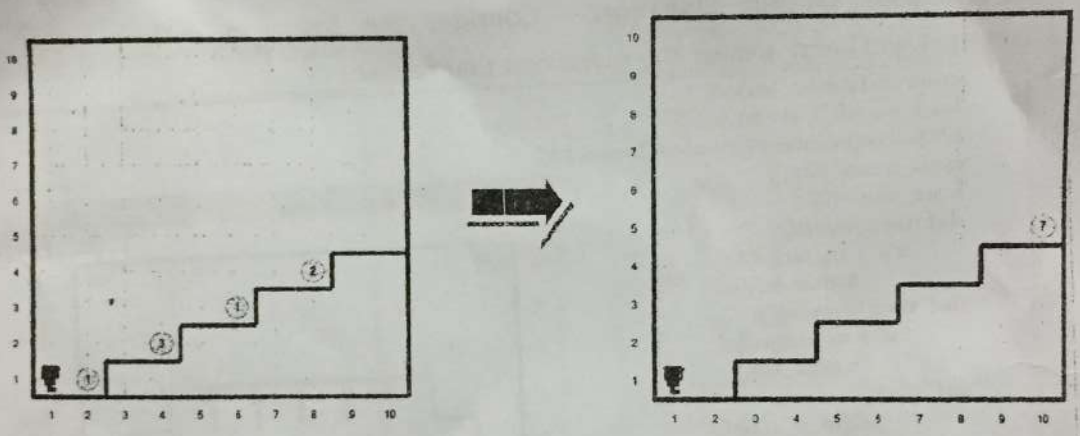
<starting of a robot> < end of a robot movements>

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.

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

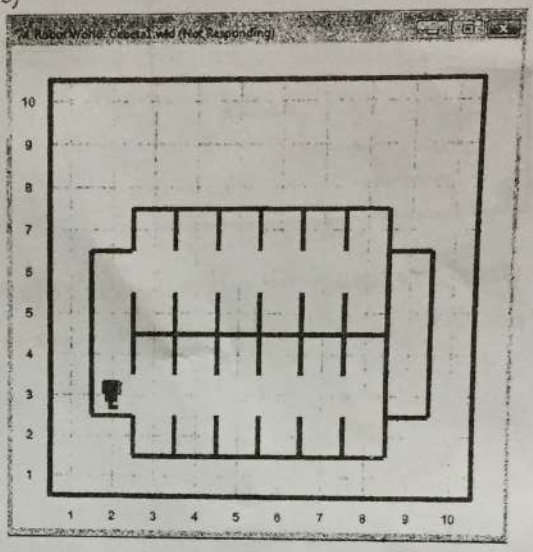


Write a program that makes the robot **to climb and collect all beepers** and keep them at position (10,5) finally the robot returns back to its initial position(1,1) as shown in the right.

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

```
from cs1robots import *
load_world("Gebeta1.wld")
h=Robot(beepers=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()

h.move()
while h.carries_beepers():
    play()
```



Questions:

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

Support your answer with justification:

_____

_____

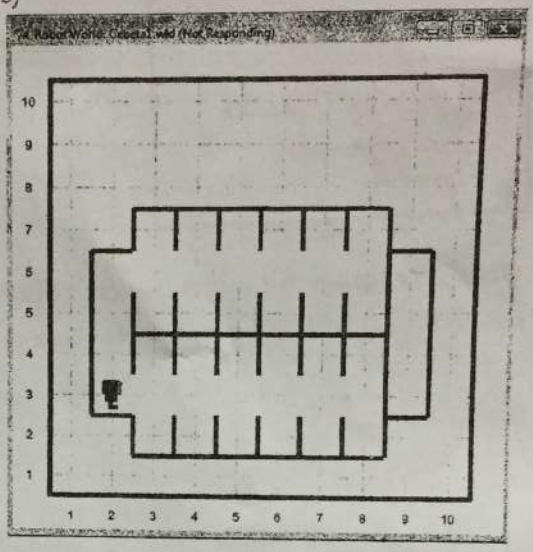
② **(10 pts)** When the program stops from running, **what will be the standing point coordinate[written as (avenue,street)] and the orientation** [face direction written as 'N','S','W', or 'E'] of the robot?

Standing point : _____Orientation: _____

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

```
from cs1robots import *
load_world("Gebeta1.wld")
h=Robot(beepers=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()

h.move()
while h.carries_beepers():
    play()
```



Questions:

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

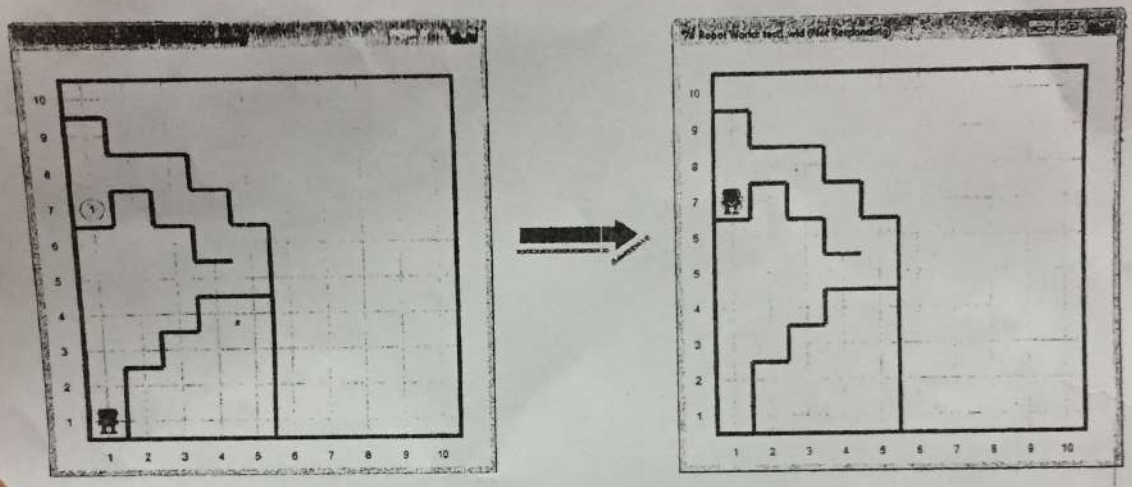
Support your answer with justification:

_____

_____

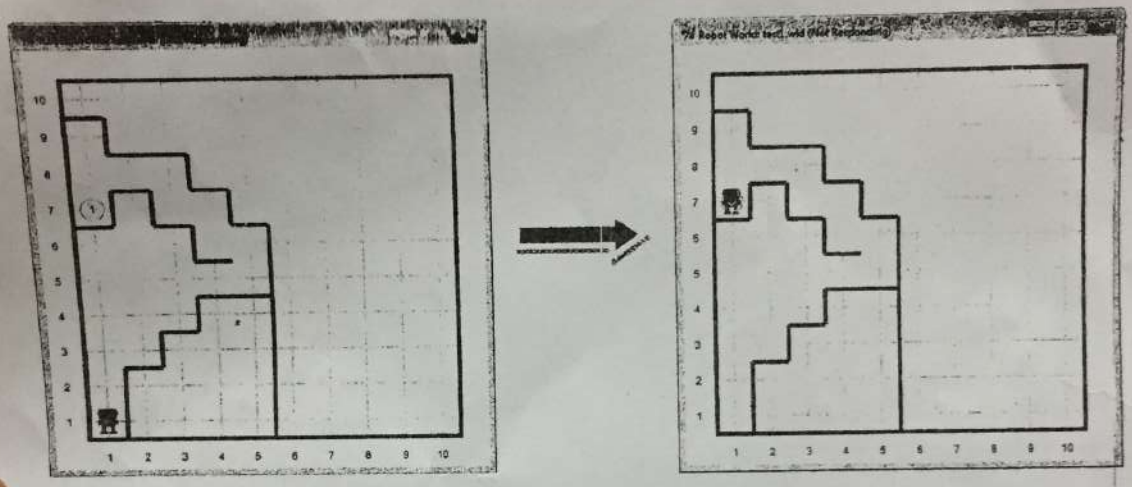
② **(10 pts)** When the program stops from running, **what will be the standing point coordinate[written as (avenue,street)] and the orientation** [face direction written as 'N','S','W', or 'E'] of the robot?

Standing point : _____Orientation: _____



※ **Bonus point problem. (20 pts)** **Program Writing Question**

As shown above, the left figure shows the robot standing on the world file "test1.wld" with its face looking to the North direction. **Write a python program** to help the robot make the **least possible moves** in order to reach in to the beeper as shown in the figure at the right. And robot should check the blocking for automatic movements. [Hint: Among the possible paths you can follow to reach in to the beeper, find the one with least number of moves.]



※ **Bonus point problem. (20 pts)** **Program Writing Question**

As shown above, the left figure shows the robot standing on the world file "test1.wld" with its face looking to the North direction. **Write a python program** to help the robot make the **least possible moves** in order to reach in to the beeper as shown in the figure at the right. And robot should check the blocking for automatic movements. [Hint: Among the possible paths you can follow to reach in to the beeper, find the one with least number of moves.]