

# Week 2 : Programming with Robots

## (Conditional Expressions, While-loops)

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# Today

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- We will practice writing more complex instructions
- NEW programming constructs
  - conditional primitives: **True, False**, with **and, or, not**
  - if statements: **if, else**, and **elif**
  - while-loops: **while**

# Functions we've seen

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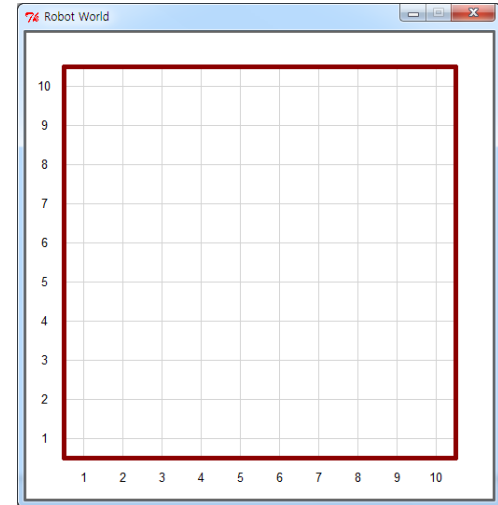
## ■ Creating a new world

- ✓ Before creating a world, remember to import necessary modules

```
from cs1robots import *
```

- ✓ Then,

```
create_world()
```



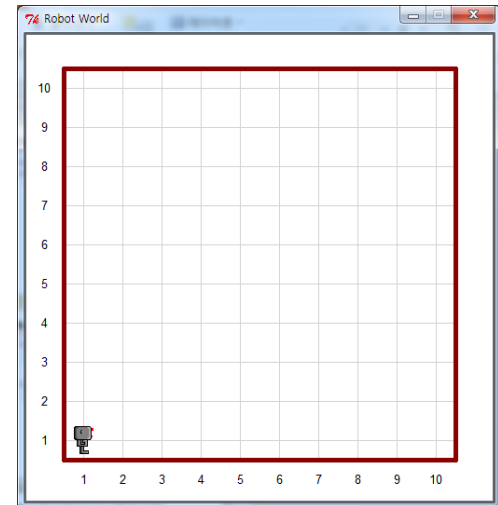
## ■ Create a robot named 'hubo'

- ✓ Create a default robot

```
hubo = Robot()
```

- ✓ Create a robot with 10 beepers

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

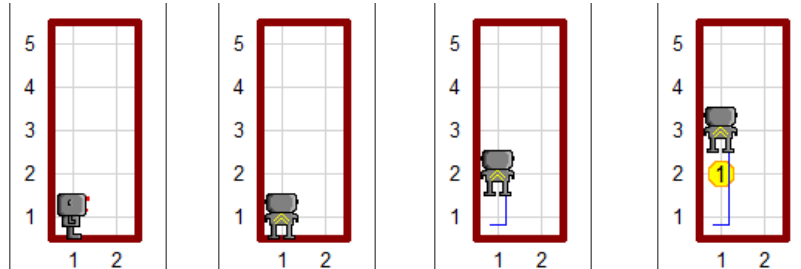


# Functions we've seen

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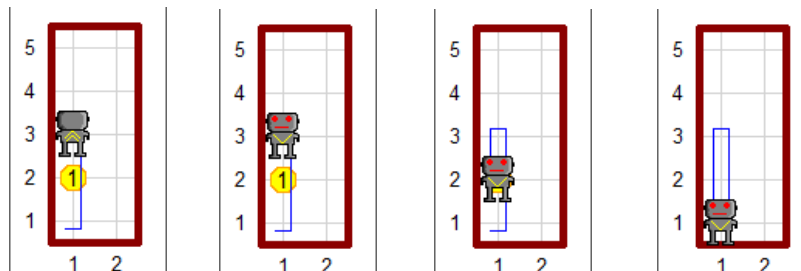
- Drop a beeper

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



- Pick a beeper

```
for i in range(2):  
    hubo.turn_left()  
    hubo.move()  
hubo.pick_beeper()  
hubo.move()
```



✓ Before picking up a beeper, hubo should be on a beeper!

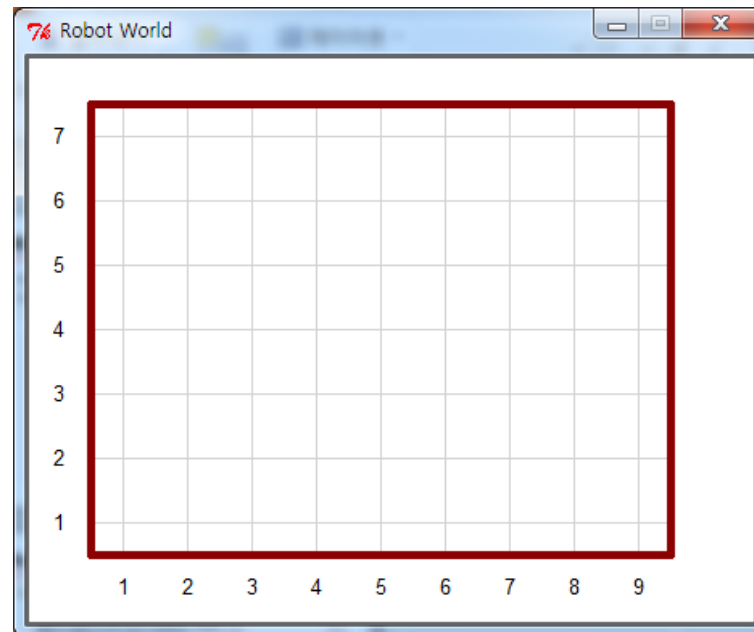
# New functions

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- Create a custom world

```
create_world(streets = 7, avenues = 9)
```

- ✓ 'streets' for the number of rows
- ✓ 'avenues' for the number of columns

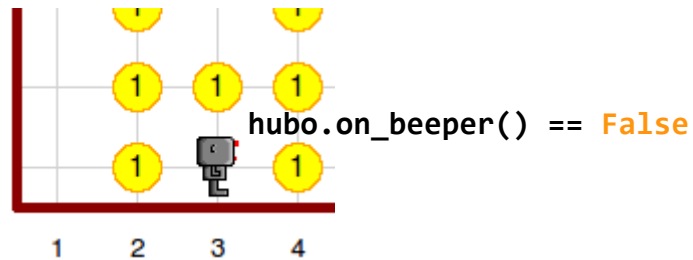
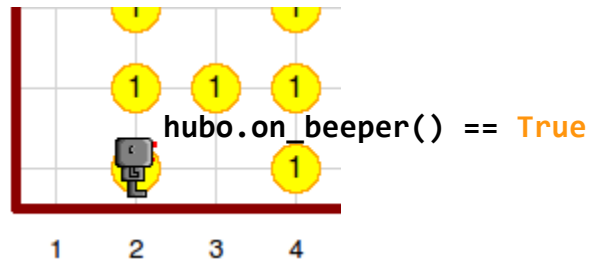


# New functions

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- Can check if there is a beeper

```
hubo.on_beeper()
```

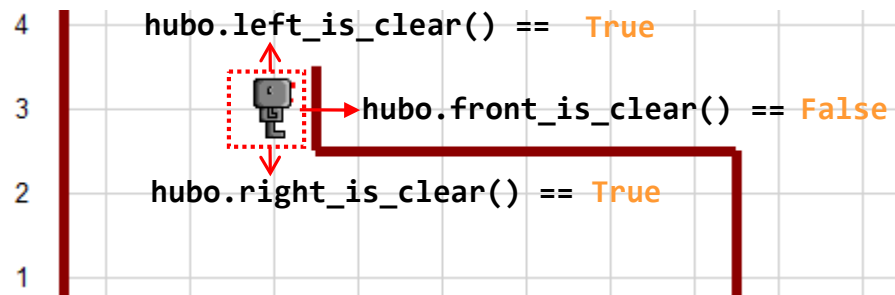


# New functions

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- Can check if there is a wall on each of the three sides

```
hubo.front_is_clear()  
hubo.left_is_clear()  
hubo.right_is_clear()
```



# If statements

---

- How **if** statement works
  - **sequentially** checks the conditionals

**if** conditional\_expression\_1:

works to do when conditional\_expression\_1 evaluates to **True**

**elif** conditional\_expression\_2:

works to do when conditional\_expression\_1 evaluates to **False** &  
conditional\_expression\_2 evaluates to **True**

**elif** conditional\_expression\_3:

works to do when conditional\_expression\_1 evaluates to **False** &  
conditional\_expression\_2 evaluates to **False** &  
conditional\_expression\_3 evaluates to **True**

...

**else:**

works to do when all the above conditions are **False**



# While loops

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- How **while** statement works
  - loop until the conditional evaluates to true

**while** **conditional\_expression**:  
works to do while **conditional\_expression** evaluates to **True**

- Watch Out!

```
Iamlying = False
```

```
while (Iamlying == False) :  
    print ("cs101 is so much fun")  
    Iamlying = True
```

# Tasks for Today!

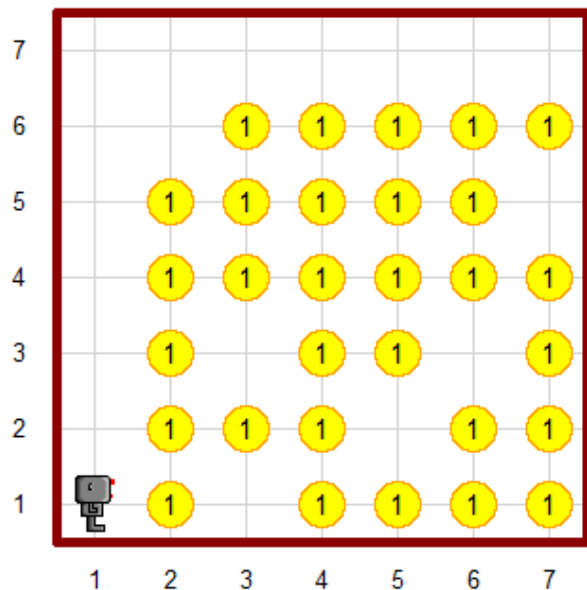
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- Read sections 10~13 in the robot notes
- Do the following tasks
  - Harvest More (page 6)
  - Plant (page 7)
  - Smart Hurdles (page 8 & 9)
  - Harvest Even More (page 10)
  - Smart ZigZag (page 10)
- When you have completed all the tasks, let a TA mark you off

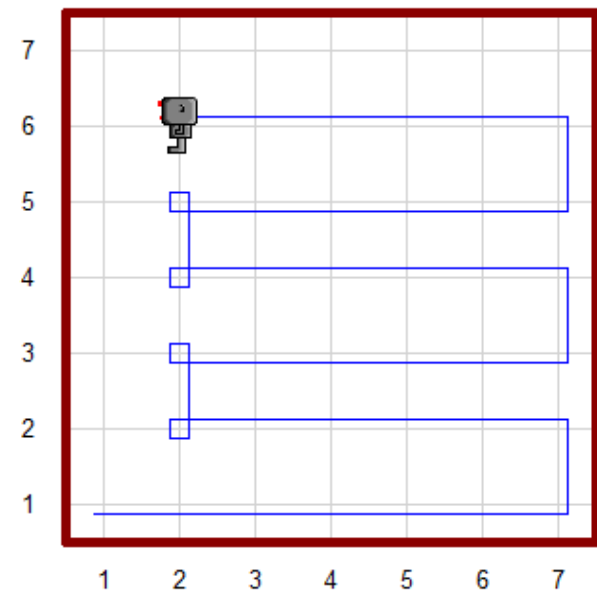
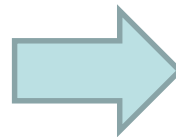
# Task | Conditionals – Harvest More

- Modify your program from the ‘Harvest Again’ task (Week 01) so that it works for *harvest3.wld*

```
load_world("worlds/harvest3.wld")
```



Before

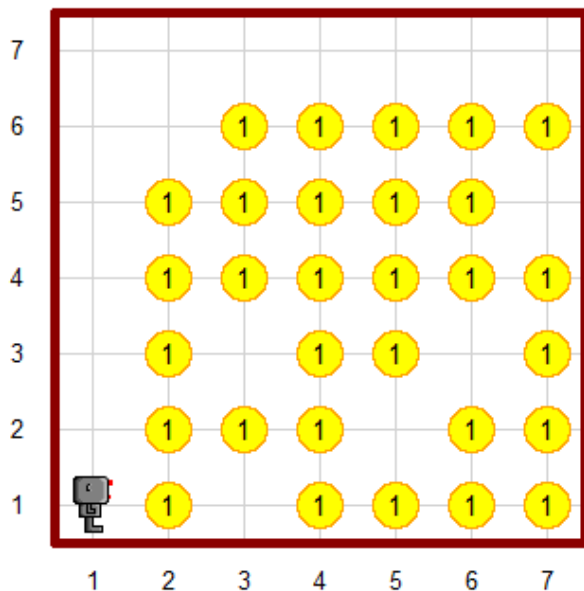


After

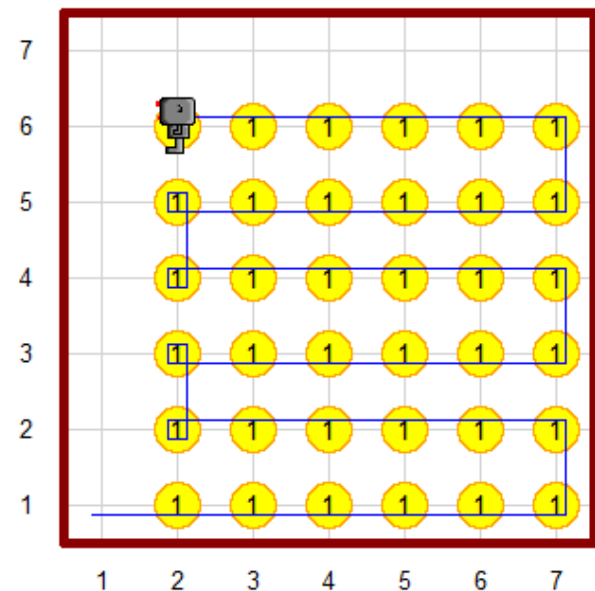
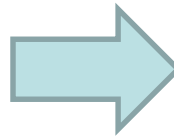
# Task | Conditionals – Plant

- Write a program so that Hubo plants beepers in empty spots
- The finished screen should look like “harvest1.wld”

```
load_world(“worlds/harvest3.wld”)
```



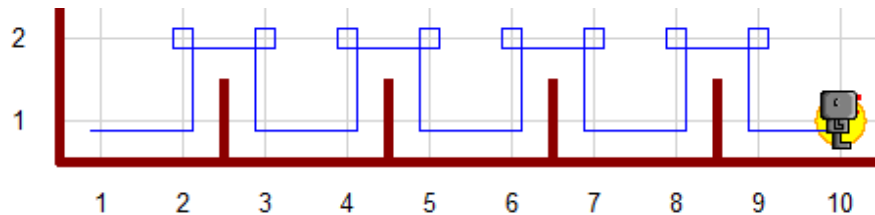
Before



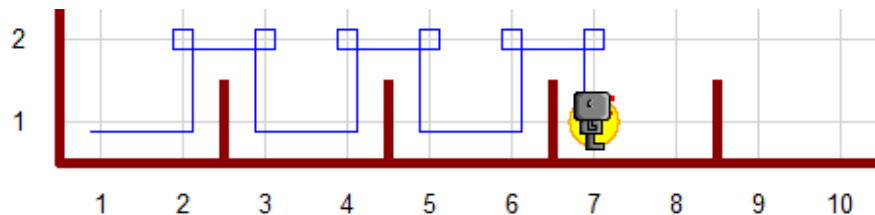
After

# Task | Conditionals – Smart Hurdles

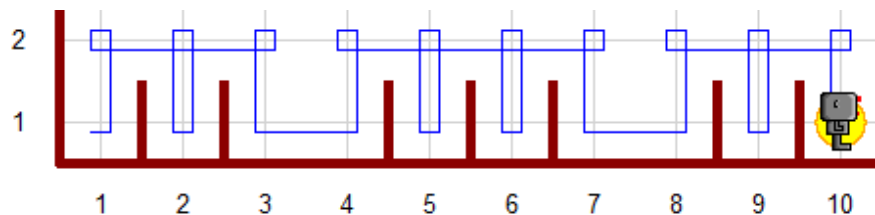
- Write **jump\_one\_hurdle()** in section 11
  - `move_jump_or_finish()` should be able to handle all three maps, “hurdles1.wld”, “hurdles2.wld” and “hurdles3.wld”. Check it yourself.
- Write a new program (similar to Hurdles3 in section 11) that uses a while loop. DO NOT USE a for-loop of fixed length
  - It should also work for all three hurdles



hurdles1.wld



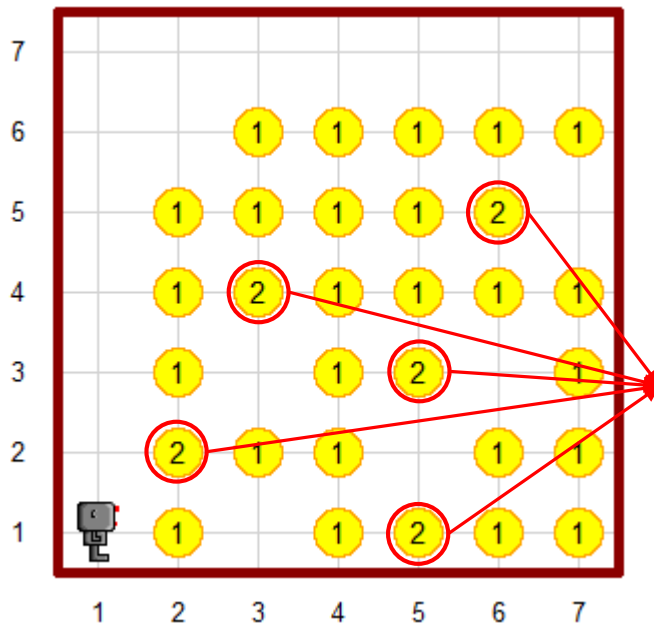
hurdles2.wld



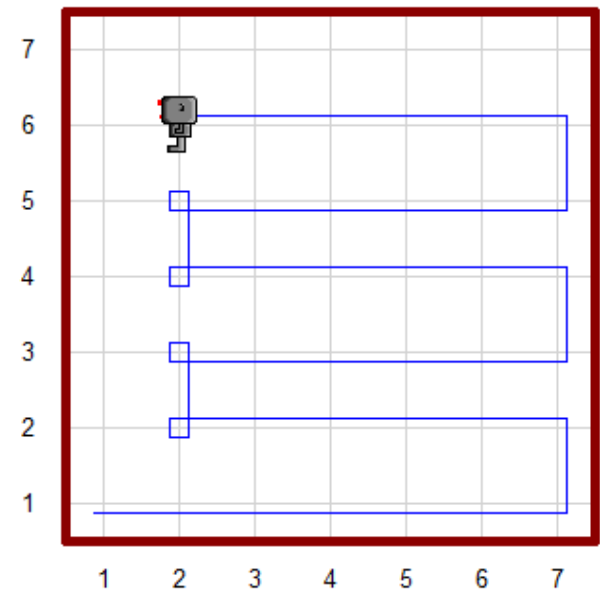
hurdles3.wld

# Task | While loop – Harvest Even More

- Modify Harvest More task
  - It should work even when there are more than one beeper on a spot (“harvest4.wld”)
  - It should also work for the previous worlds (“harvest1.wld” and “harvest3.wld”)



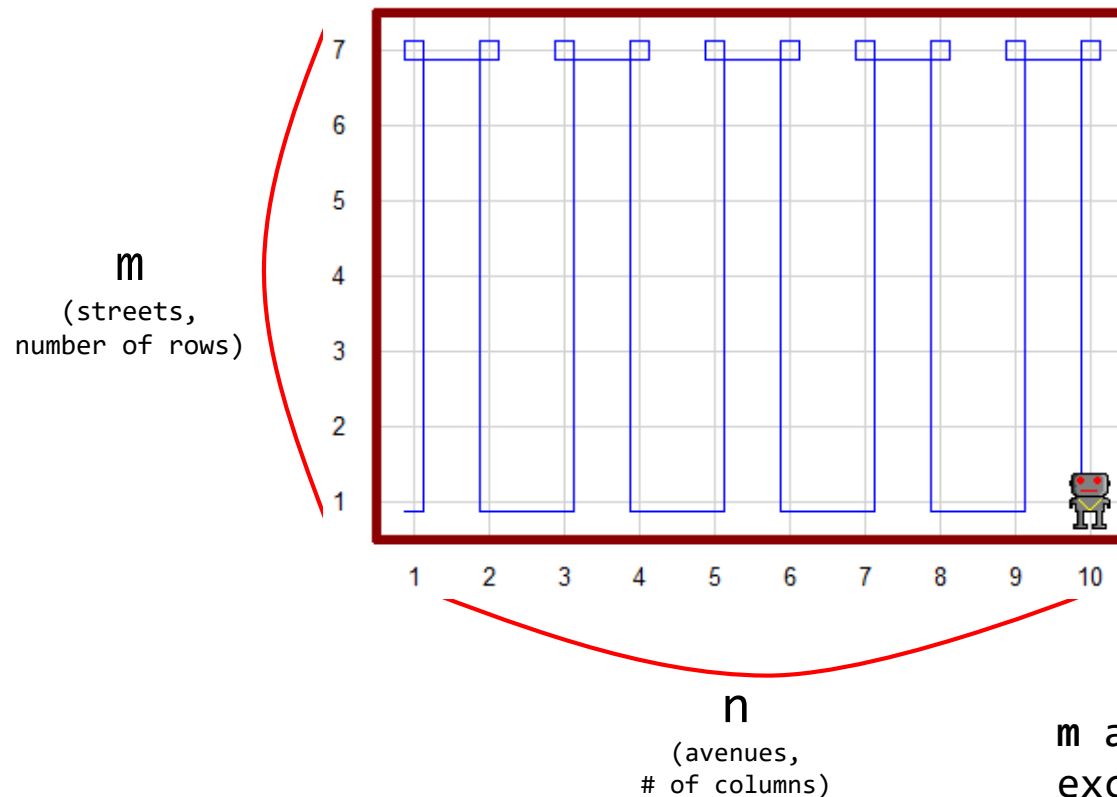
Have to harvest  
all carrots  
on one place





# Task | While loop – Smart ZigZag

- Rewrite ZigZag program (Week 01) so that the robot can visit every spot in an empty world of any size in zigzag fashion
  - It should work for even and odd numbers of streets and avenues



$m$  and  $n$  can be any integer except for  $m=1$  or  $n=1$

# How we communicate in CS101

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# Who do I talk to?

---

- anything related to Lectures → **Professors**

ex) I did not understand “XYZ” concept in lecture 5, can you help me?

- Everything else → **TA's**
  - Lab, Lab material, Exams, Schedule, Lab & Exam Scores, Course Policy, meaning of life, etc.

**ONLY GOD KNOWS YOUR FINAL GRADE.**

**Prof. Moonzoo Kim might be able to talk to God at the end of June.**

**Before June, there's no point in asking.**

# Communication Channels

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In the order of responsiveness,

1. In person
- 2. Q&A board on elice \***
3. Email

# In person

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Professor Office Hours, TA Office Hours, during Lab,

You know what to do, just talk to them.

# Q&A board

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Q&A Board is for YOU to discuss with each other!

Questions directed to TAs, also fine!

**BUT SOME QUESTIONS YOU POST WILL NOT GET ANSWERED**

# DON'T

---

질문이요!ㅠㅠ	2 MONTHS AGO	1		
질문이 있습니다!	2 MONTHS AGO	1		
질문이 있습니다	2 MONTHS AGO	2		
질문있습니다	2 MONTHS AGO	2		
질문이요~	2 MONTHS AGO	2		
Urgent matter	2 MONTHS AGO	2		
4-2	3 MONTHS AGO	1		
4-2 질문	3 MONTHS AGO	1		
HW3 질문드려요	3 MONTHS AGO	1		
HW4	3 MONTHS AGO	2		

# DON'T

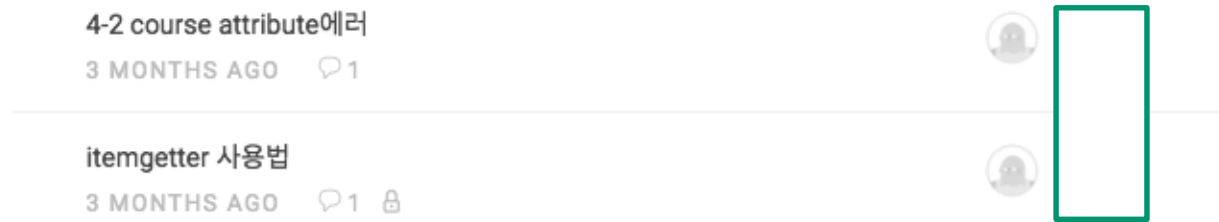
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# DO

---

- In the title,
  - Summarize your question and problem



- In the content,
  - Be polite
  - Be specific
  - **NEVER USE PRIVATE OPTION**
    - Unless it contains your OWN code

# My Own Code?

---

[< BACK TO LIST](#)

trouble with elice.utils and file output



♥ 0 🔒 PRIVATE LESS THAN A MINUTE AGO

Dear TA,

This is my code and it doesn't run. Could you please fix it?

Thanks,

Best Regards,

ABC

## ATTACHMENTS

📎 nodap.png 39.67 KB 🗑



# My Own Code?

---

< BACK TO LIST

trouble with elig



Mins

Dear T

This

Tha

Best

ABC

ATTACH

nodap.png

We will help you find  
solutions yourself

We will never provide  
direct answers to  
exercises & homework  
questions

**DO NOT EVEN BOTHER  
ASKING**

# Email

---

In the subject,

Provide a header [CS101] and summarize what you want to ask

☐ ☆ ☐



[CS101] 숙제2-1에서 소수점 몇번째 자리까지 고려하나요?

☐ ☆ ☐

[CS101] How many decimal points do I need to consider in Homework 2-1

In the content,

Provide **as much detail as possible**

☐ ☆ ☐



조교님, 숙제 3번 에러가 나요. - 제공내

# Email

---

In the subject,

Provide a header [CS101] and summarize what you want to ask

☐ ☆ 

[CS101] 숙제2-1에서 소수점 몇번째 자리까지 고려하나요?

☐ ☆ 

[CS101] How many decimal points do I need to consider in Homework 2-1

In the content,

Provide **as much detail as possible**

☐ ☆ 

조교님

이곧내

This email  
will not get  
answered

# How to get the information

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# Tip: How to Get the Information

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- Two answers
  1. Use help function

<pre>1 help('math.sin')</pre>	<b>TERMINAL</b>  Help on built-in function sin in math:  math.sin = sin(...) sin(x)  Return the sine of x (measured in radians).
-------------------------------	---

<pre>1 help('print')</pre>	<b>TERMINAL</b>  Help on built-in function print in module builtins:  print(...) print(value, ..., sep=' ', end='\n', file=sys.stdout, flush=False)  Prints the values to a stream, or to sys.stdout by default. Optional keyword arguments: file: a file-like object (stream); defaults to the current sys.stdout. sep: string inserted between values, default a space. end: string appended after the last value, default a newline. flush: whether to forcibly flush the stream.
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# Tip: How to Get the Information

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- Question: How to use randint function in the random module

# Tip: How to Get the Information

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- Question: How to use randint function in the random module
- Steps
  - Type `help('random.randint')`
  - Run the python code
  - Read the description of the function

```
1 help('random.randint')
```

TERMINAL

Help on method randint in random:

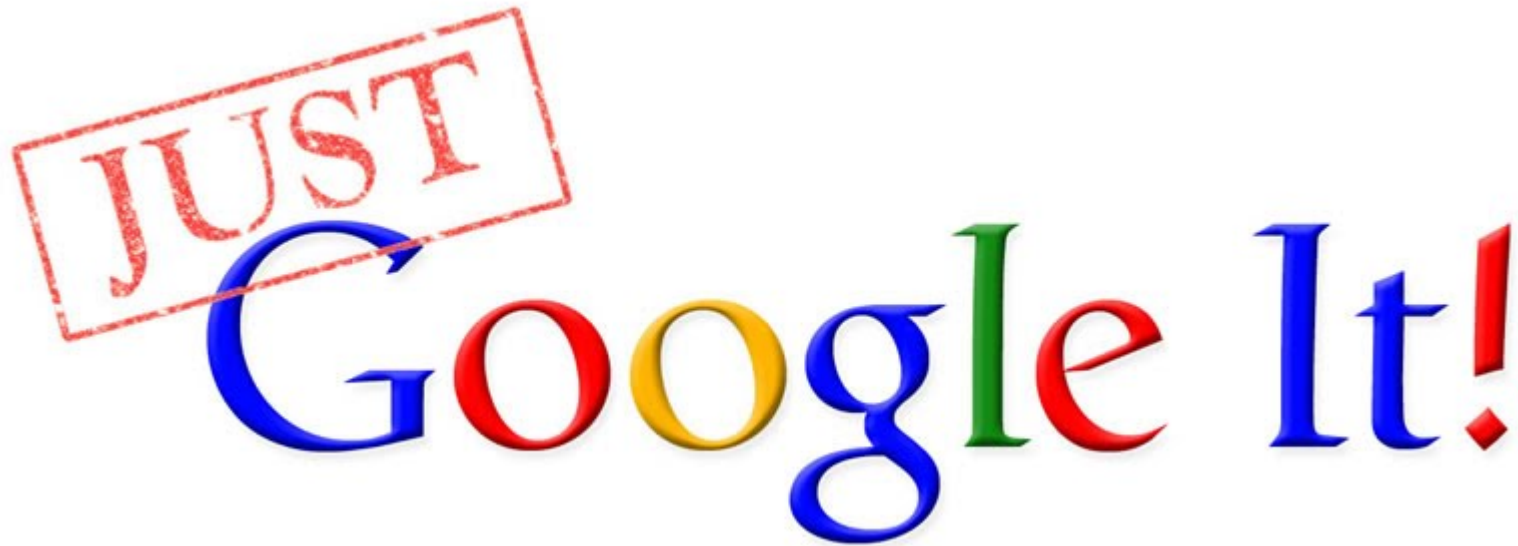
random.randint = randint(a, b) method of random.Random instance  
Return random integer in range [a, b], including both end points.



# Tip: How to Get the Information

---

- Two answers
  1. Use help function
  2. Googling!

The Google logo is displayed in its characteristic multi-colored font (blue, red, yellow, blue, green, red). A red, rectangular stamp with a distressed, ink-like texture is placed diagonally over the first part of the logo, containing the word "JUST" in a bold, serif font. The logo continues with "Google" and ends with "It!" in blue, where the exclamation mark is red.



# Tip: How to Get the Information

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- Question: How to use randint function in the random module

# Tip: How to Get the Information

---

- Question: How to use randint function in the random module
- Steps
  - Go Google homepage - <https://www.google.com>



Google Search

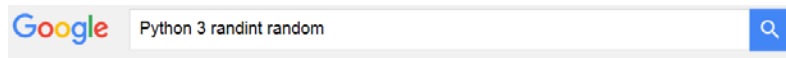
I'm Feeling Lucky

# Tip: How to Get the Information

- Question: How to use randint function in the random module
- Steps

- Go Google homepage - <https://www.google.com>
- Type the important keywords

Ex) Python 3 randint random



All Videos Images News More ▾ Search tools

About 166,000 results (0.25 seconds)

**9.6. random — Generate pseudo-random numbers — Python v3.1.5 ...**  
<https://docs.python.org/3.1/library/random.html> ▾

This module implements pseudo-random number generators for various distributions. ...  
`random.randint(a, b)`: Return a random integer N such that  $a \leq N \leq b$ . ...  
`random.sample([1, 2, 3, 4, 5], 3)` # Choose 3 elements [4, 1, 5].

**9.6. random — Generate pseudo-random numbers — Python 3.5.2 ...**  
<https://docs.python.org/3/library/random.html> ▾

This module implements pseudo-random number generators for various distributions. ...  
`random.randint(a, b)` ... `random.shuffle(items)` ...  
`random.sample([1, 2, 3, 4, 5], 3)` # Three samples without replacement [4, ...

**9.6. random — Generate pseudo-random numbers — Python 2.7.12 ...**  
<https://docs.python.org/2/library/random.html> ▾

This module implements pseudo-random number generators for various ...  
`1 1800146073117523 >>> random.randint(1, 10)` # Integer from 1 to 10, ... items = [1, 2, 3, 4, 5, 6, 7]  
`>>> random.shuffle(items)` ... items [7, 3, 2, 5, 6, 4, ...

**How to use the Random Module in Python**

[www.pythontutorial.net/random/how-to-use-the-random-module-in-python](http://www.pythontutorial.net/random/how-to-use-the-random-module-in-python) ▾

Dec 24, 2012 - If we wanted a random integer, we can use the `randint` function. ...  
`import random`  
`for i in range(3): print random.randrange(0, 101, 5) ...`

**python - Generate random integers between 0 and 9 - Stack Overflow**

[stackoverflow.com/questions/3996904/generate-random-integers-between-0-and-9](https://stackoverflow.com/questions/3996904/generate-random-integers-between-0-and-9) ▾

Oct 22, 2010 - Try: `from random import randint print(randint(0,9))`. More info: ... between 0 and 9 (inclusive) in Python? i.e. 0 1 2 3 4 5 6 7 8 9. python ...

**How do I generate (and label) a random integer with python 3.2 ...**

[stackoverflow.com/.../how-do-i-generate-and-label-a-random-integer-with-python-3-...](https://stackoverflow.com/.../how-do-i-generate-and-label-a-random-integer-with-python-3-...) ▾

Dec 23, 2010 - Use `random.randrange` or `random.randint` (Note the links are to the Python ... Browse other questions tagged `python` `python-3.x` `random` `integer` ...

**python - Difference between random randint vs randrange - Stack ...**

[stackoverflow.com/questions/.../difference-between-random-randint-vs-randrange](https://stackoverflow.com/questions/.../difference-between-random-randint-vs-randrange) ▾

Aug 22, 2010 - The docs on `randrange` say: `random.randrange([start], stop[, step])`. Return a ... @ Whymarrh, In case you're still wondering (almost 3 years later), Veedrac's answer right below provides a source for this alias.

**numpy.random.randint — NumPy v1.11 Manual**

[docs.scipy.org/doc/numpy/reference/generated/numpy.random.randint.html](https://docs.scipy.org/doc/numpy/reference/generated/numpy.random.randint.html) ▾

Return `random` integers from the "discrete uniform" distribution of the specified dtype in the ...  
`np.random.randint(5, size=(2, 4))` array([[4, 0, 2, 1], [3, 2, 2, 0]]) ...

**random — Pseudorandom number generators - Python ... - PyMOTW 3**

<https://pymotw.com/2/random/> ▾

`python random_random.py 0.182 0.155 0.097 0.175 0.008 $ python ... import random print '[1, 100]:'  
for i in xrange(3): print random.randint(1, 100) print print '-5 ...`

**Python Random Numbers Examples: random.choice - Dot Net Perls**

<https://www.dotnetperls.com/random-python> ▾

Based on: Python 3 Python program that uses `random`, `randint` import `random` i = 0 while i < 10: #  
Get `random` number in range 0 through 9. n = `random.randint(0 ...`

Searches related to Python 3 randint random

`randint python` **example** `python random list`

`python3 randint` `python random string`

`random.randint python` **numpy** `random`

`import random python` `python random sample from list`

# Tip: How to Get the Information

- Question: How to use randint function in the random module
- Steps
  - Go Google homepage - <https://www.google.com>
  - Type the important keywords  
Ex) Python 3 randint random
  - Read the relevant web-pages

<https://docs.python.org/3/library/random.html>

## Functions for integers:

```
random.randrange(stop)
```

```
random.randrange(start, stop[, step])
```

Return a randomly selected element from `range(start, stop, step)`. This is equivalent to `choice(range(start, stop, step))`.

The positional argument pattern matches that of `range()`. Keyword arguments should follow.

*Changed in version 3.2:* `randrange()` is more sophisticated about producing equally likely results than `choice()`.

```
random.randint(a, b)
```

Return a random integer  $N$  such that  $a \leq N \leq b$ . Alias for `randrange(a, b+1)`.

## Generate random integers between 0 and 9

▲ How can I generate random integer numbers between 0 and 9 (inclusive) in Python?

407 i.e. 0 1 2 3 4 5 6 7 8 9

▼ python

★ share improve this question  
49

edited Feb 9 at 18:31  
Makoto  
64.2k ● 10 ● 65 ● 115

asked Oct 22 '10 at 12:48  
Patrick  
13.1k ● 67 ● 216 ● 413

add a comment

7 Answers

active oldest votes

▲ Try:

660  
▼  
✓  

```
from random import randint  
print(randint(0,9))
```

More info: <https://docs.python.org/3.1/library/random.html#random.randint>

share improve this answer

edited Jun 30 '15 at 14:07  
FlipperPA  
2,946 ● 1 ● 7 ● 27

answered Oct 22 '10 at 12:51  
kovshenin  
10.7k ● 4 ● 26 ● 39

Any Questions?

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