Week 2 : Programming with Robots
(Conditional Expressions, While-loops)

Today

- We will practice writing more complex instructions

- NEW programming constructs
  - conditional primitives: **True**, **False**, with **and, or, not**
  - if statements: **if**, **else**, and **elif**
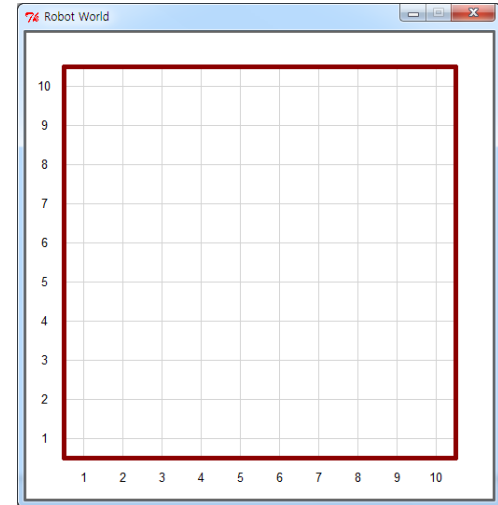 - while-loops: **while**

Functions we've seen

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

    from cs1robots import *

  - ✓ Then,

    create_world()

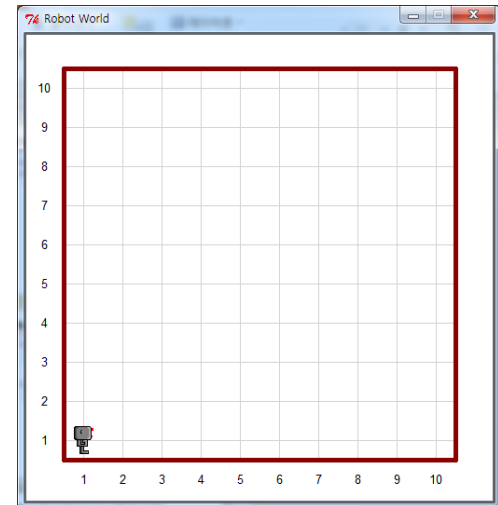- ## Create a robot named 'hubo'
  - ✓ Create a default robot

    hubo = Robot()

  - ✓ Create a robot with 10 beepers
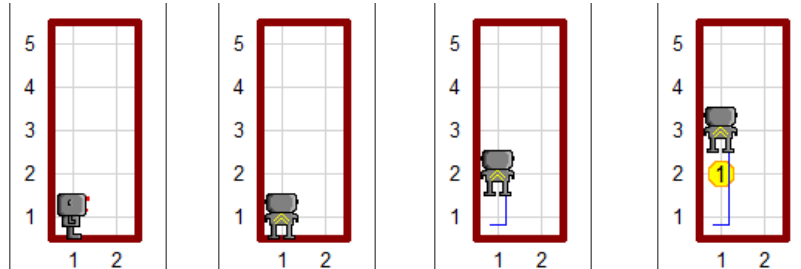
    hubo = Robot(beepers = 10)
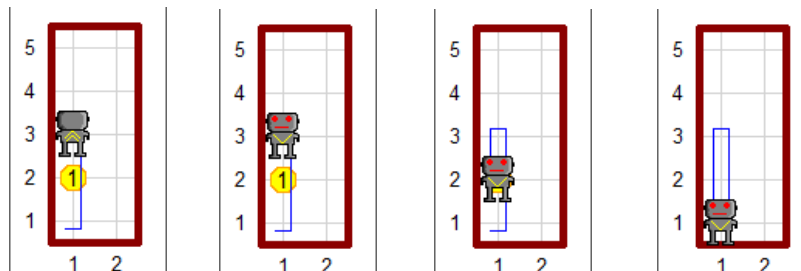
Functions we've seen

- ## 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()
```


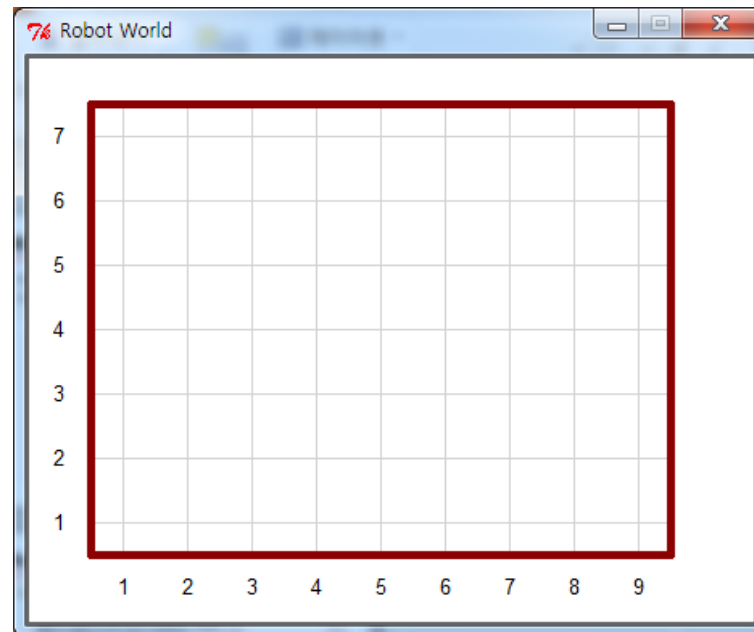✓ Before picking up a beeper, hubo should be on a beeper!

New functions

- Create a custom world

  create_world(streets = 7, avenues = 9)

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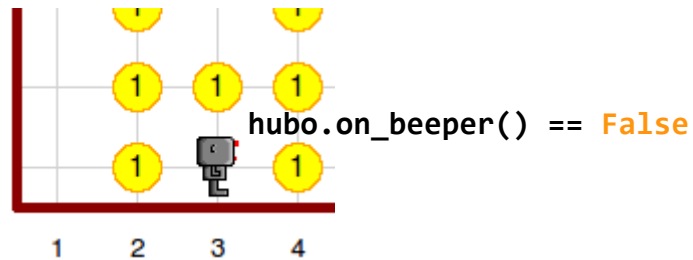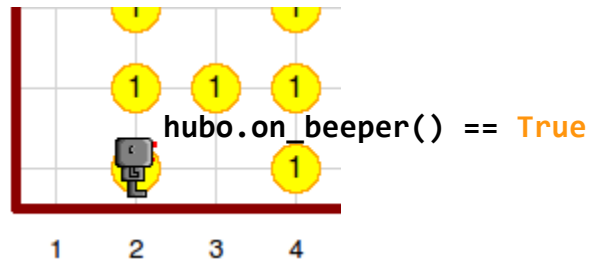
New functions

- Can check if there is a beeper

hubo.**on_beeper()**
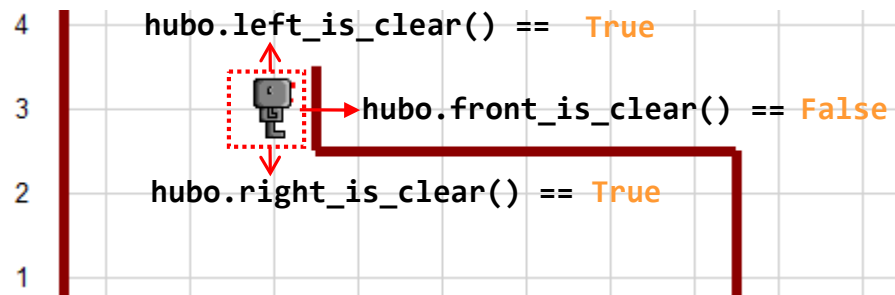

hubo.on_beeper() == True

hubo.on_beeper() == False

New functions

- 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()
```


4	hubo.left_is_clear() == True
3	hubo.front_is_clear() == False
2	hubo.right_is_clear() == True
1	

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

- ## 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!

- 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)

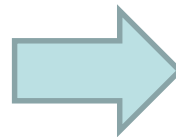- When you have completed all the tasks, let a TA mark you off

Task | Conditionals – Harvest More

- Modify your program from the 'Harvest Again' task (Week 01) so that it works for *harvest3.wld*
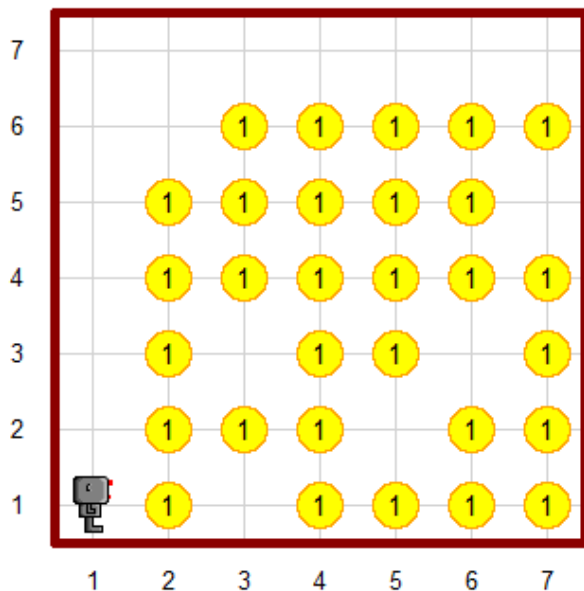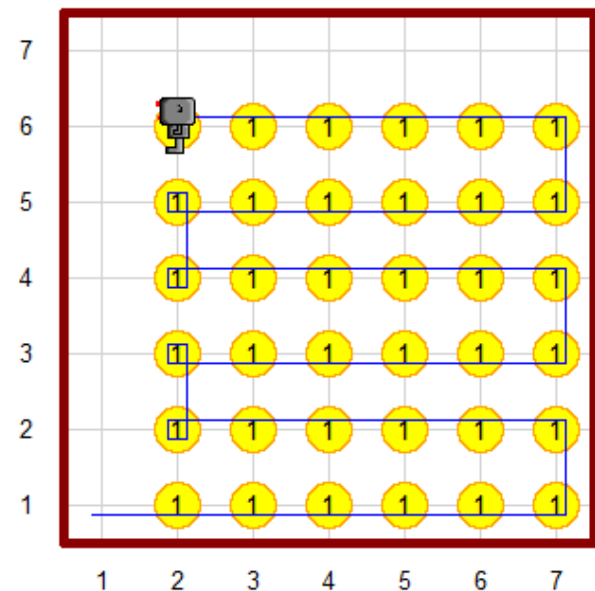
  load_world("worlds/harvest3.wld")
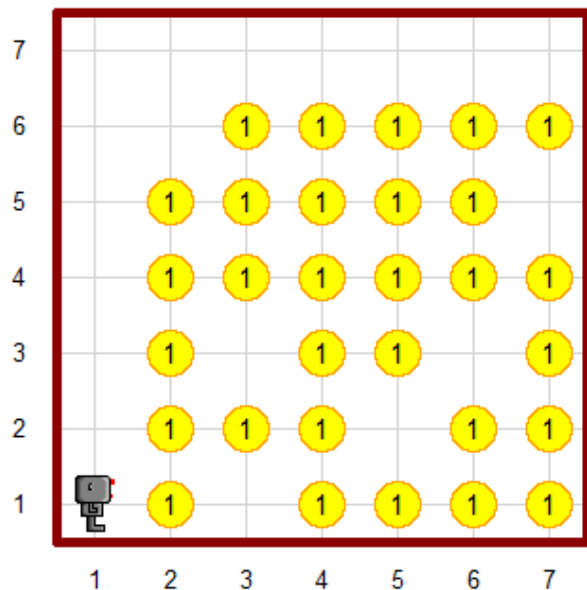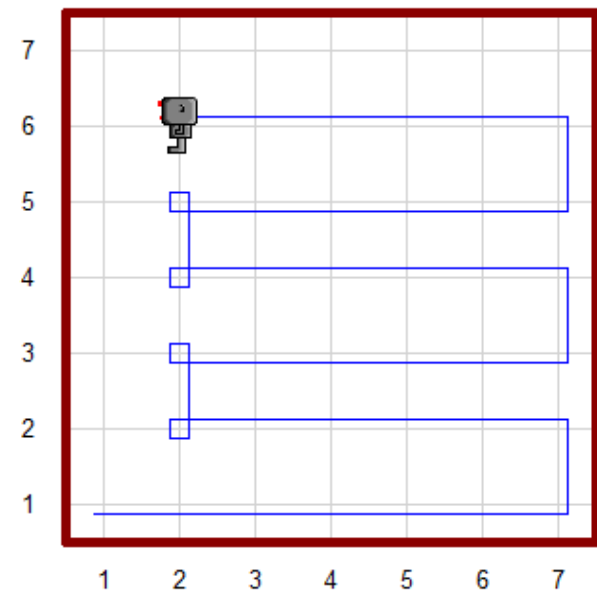
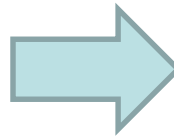**Before**   **After**

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
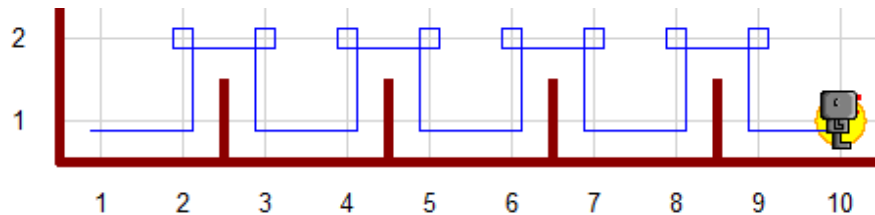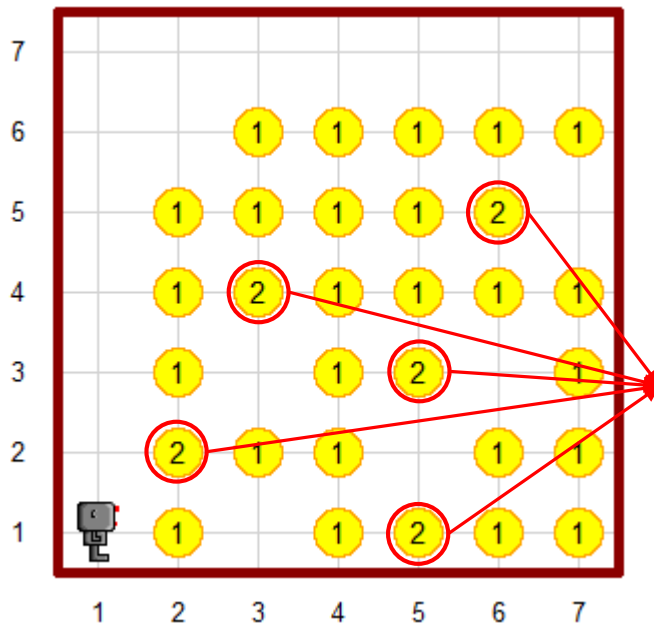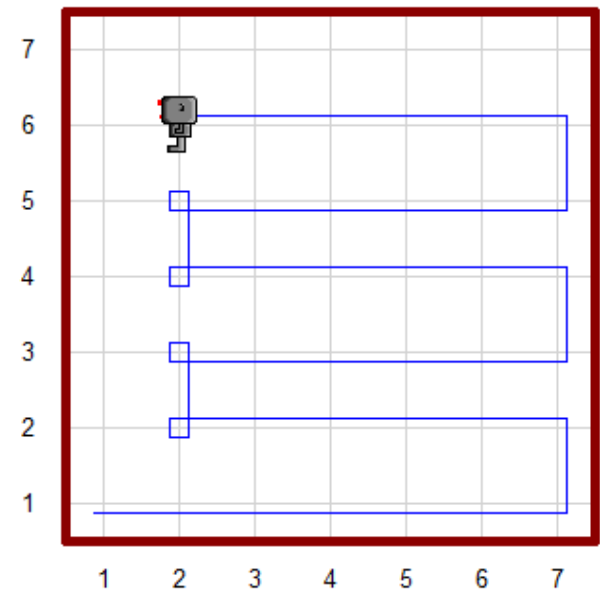

`hurdles1.wld`
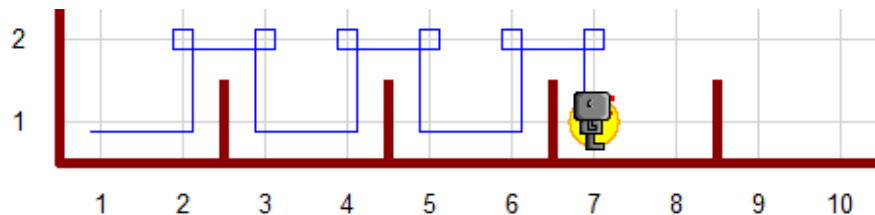
`hurdles2.wld`
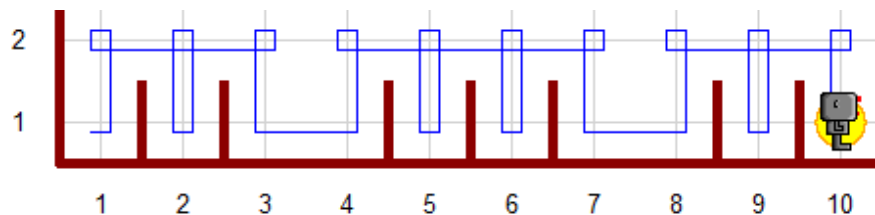
`hurdles3.wld`

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")
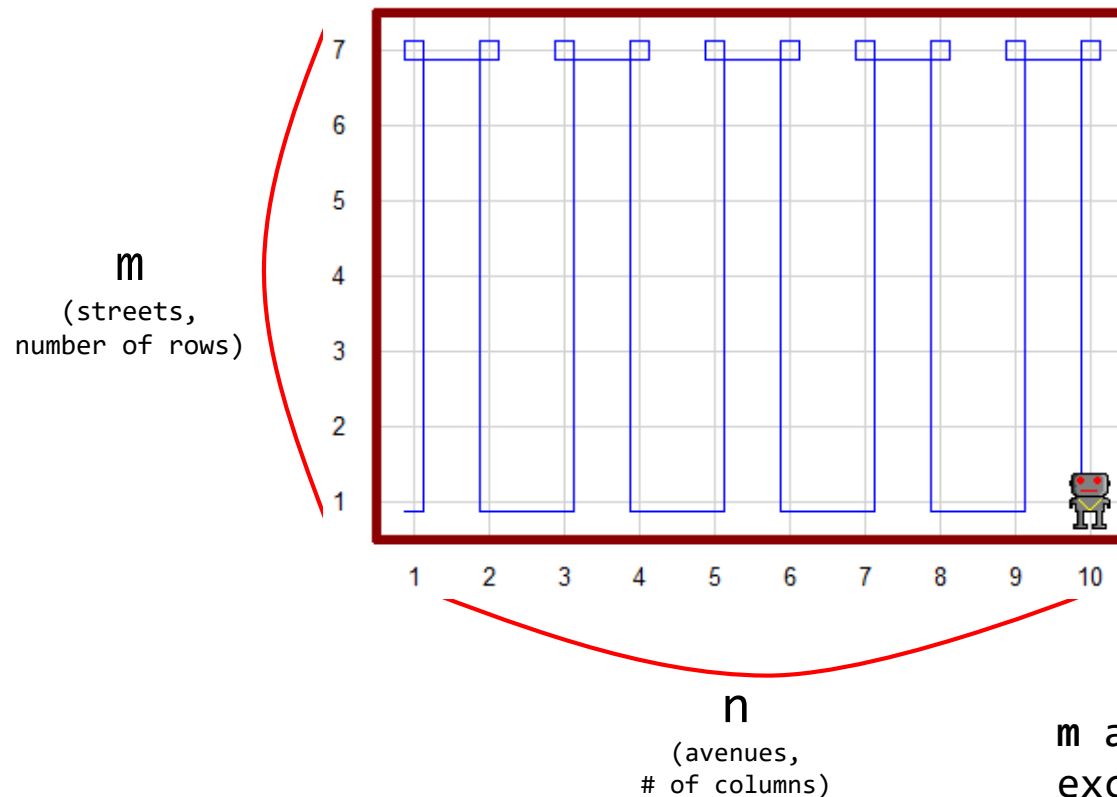

Have to harvest all carrots on one place

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
(streets,
number of rows)

n
(avenues,
# of columns)

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

How we communicate in CS101

Who do I talk to?

- anything related to <u>Lectures</u> → **Professors**

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

- <u>Everything else</u> → **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

In the order of responsiveness,

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

In person

Professor Office Hours, TA Office Hours, during Lab,

You know what to do, just talk to them.

Q&A board

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

질문이요!ㅠㅠ
2 MONTHS AGO 💬1 🔒

질문이 있습니다!
2 MONTHS AGO

질문이 있습
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질문
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We will not answer
questions with these
titles

4-2
3 MON

4-2 질문
3 MONTHS AG

HW3 질문드려요
3 MONTHS AGO 💬1

HW4
3 MONTHS AGO 💬2 🔒

DO

- In the title,
  - Summarize your question and problem

  4-2 course attribute에러
  3 MONTHS AGO   💬 1

  itemgetter 사용법
  3 MONTHS AGO   💬 1   🔒
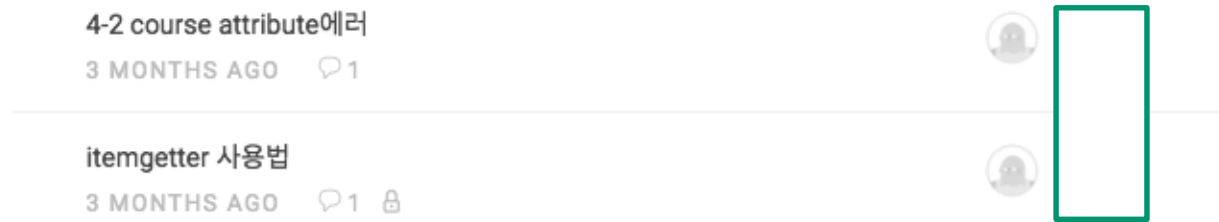
- In the content,
  - Be polite
  - Be specific
  - **NEVER** USE PRIVATE OPTION
    - Unless it contains your OWN code

My Own Code?

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 eli

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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. - 제곧내

Email

In the subject,

Provide a header [CS101] and summarize what you
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☐ ☆ ▷ [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 곧내

This email
will not get
answered

How to get the information

Tip: How to Get the Information

- Two answers
  1. Use help function

```
1 help('math.sin')
```

```
TERMINAL

Help on built-in function sin in math:

math.sin = sin(...)
    sin(x)

    Return the sine of x (measured in radians).
```

```
1 help('print')
```

```
TERMINAL

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.
```

Tip: How to Get the Information

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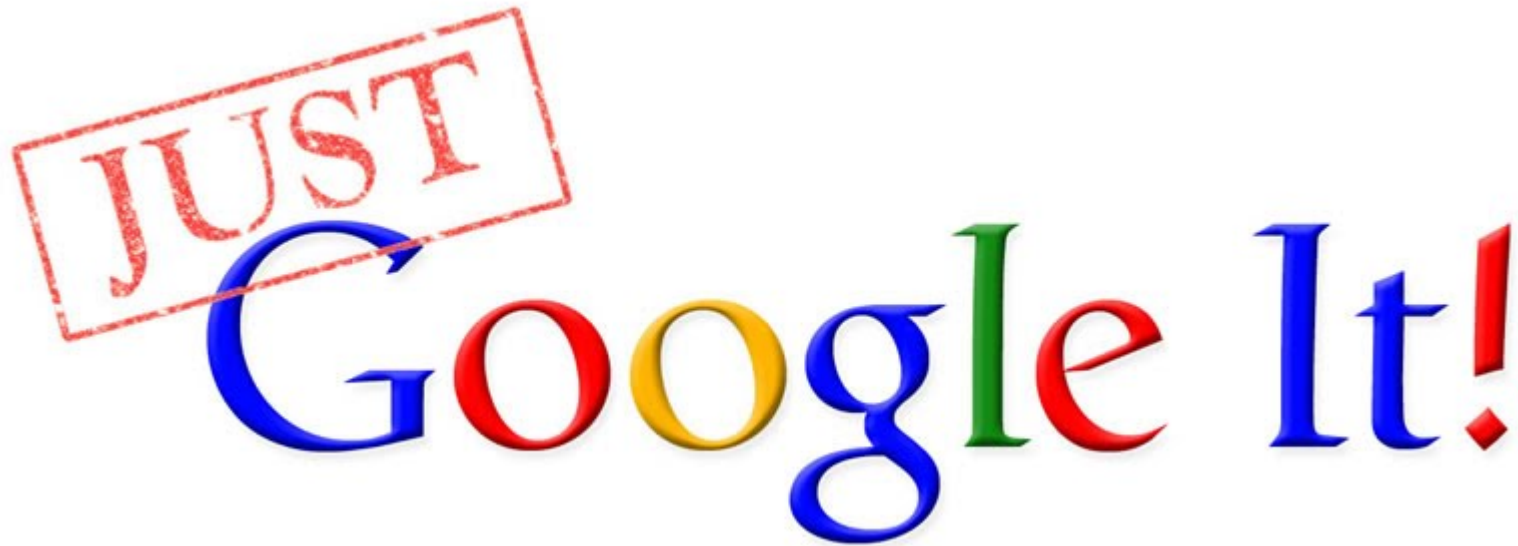
random.randint = randint(a, b) method of random.Random instance
    Return random integer in range [a, b], including both end points.

Tip: How to Get the Information

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

Tip: How to Get the Information

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  - Go Google homepage - https://www.google.com

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  - Type the important keywords
    Ex) Python 3 randint random

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  - Read the relevant web-pages

Any Questions?