Everybody in this country should learn to program a computer... because it teaches you how to think

Steve Jobs, co-founder and CEO of Apple Inc. (1955 - 2011)

Week 1: Introduction to Lab

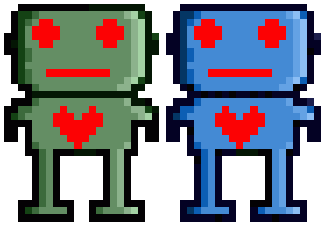
Welcome to KAIST CS101

- Introduction to Programming
- Goal of CS101: Understanding two things
  - Programming skills

    It is needed in all areas of science and engineering
  - Computational thinking

    It influences how you go about solving a problem
- Course structure
  - Lectures
  - Lab works
  - Homework
  - Midterm/Final exams

KAIST



Course schedule

Google calendar: https://goo.gl/tt4Ppj

March				
Mon	Tue	Wed	Thur	Fri
	Lect 1 Lab 1 (C/D)	Samiljeol	Lab 1 (G/H)	Lab 1 (I/J)
	February 28	1	2	3
Lab 1 (A/B)	Lect 2 Lab 2 (C/D)	Lab 1 (E/F)	Lab 2 (G/H)	Lab 2 (I/J)
6	7	8	9	10
HW 1 Lab 2 (A/B)	Lect 3 Lab 3 (C/D)	Lab 2 (E/F)	Lab 3 (G/H)	Lab 3 (I/J)
13	14	15	16	17
Lab 3 (A/B) OH 1	Lect 4 Lab 4 (C/D) OH 2	Lab 3 (E/F) OH 3	Lab 4 (G/H) OH 4	Lab 4 (I/J) OH 5
20	21	22	23	24
Lab 4 (A/B)	Lect 5 Lab 5 (C/D)	Lab 4 (E/F)	Lab 5 (G/H)	Lab 5 (I/J)
27	28	29	30	31

April				
Mon	Tue	Wed	Thur	Fri
HW 2 Lab 5 (A/B)	Lect 6 Lab 6 (C/D)	Lab 5 (E/F)	Lab 6 (G/H)	Lab 6 (I/J)
3	4	5	6	7
Lab 6 (A/B) OH 6	OH 7	Lab 6 (E/F) OH 8	OH 9	OH 10
10	11	12	13	14
Mid Exam				
17	18	19	20	21
	Lect 7 Lab 7 (C/D)	Lab 7 (E/F)	Lab 7 (G/H)	Lab 7 (I/J)
24	25	26	27	28

May				
Mon	Tue	Wed	Thur	Fri
HW 3 Lab 7 (A/B)		Buddha's Birthday		Children's Day
1	2	3	4	5
	Lect 8 Lab 8 (C/D)	Lab 8 (E/F)	Lab 8 (G/H)	Lab 8 (I/J)
8	9	10	11	12
Lab 8 (A/B)	Lect 9 Lab 9 (C/D)	Lab 9 (E/F)	Lab 9 (G/H)	Lab 9 (I/J)
15	16	17	18	19
HW 4 Lab 9 (A/B)	Lect 10	Spring Student Festival	Spring Student Festival	
22	23	24	25	26
OH 11	Lect 11 Lab 10 (C/D) OH 12	Lab 10 (E/F) OH 13		
29	30	31		

June				
Mon	Tue	Wed	Thur	Fri
			Lab 10 (G/H) OH 14	Lab 10 (I/J) OH 15
			1	2
Lab 10 (A/B) OH 16	Memorial Day	OH 17	OH 18	OH 19
5	6	7	8	9
Final Exam				
12	13	14	15	16

Policy for grading

- CS101 grading consists of two parts: theory and practice
  - Theory points
    - 100 points for midterm exam
    - 100 points for final exam
  - Practice points
    - 100 points for lecture attendance
    - 100 points for lab work (quiz, tasks)
    - 200 points for homework
  - Students need to collect **at least 340** practice points
- **The final score is determined entirely by the theory point**
  - Practice point is just a **qualification**
    You will get F grade if your practice point is below 340

Example	Student A	Student B
Theory points	170	197
Practice points	340	339
Final grade	**B**	**F**

Student B

Tasks

- You should finish the given tasks within each lab session
  - TA will check your program
  - You have to explain your source code when TA checks your code

- Don’t do the tasks at home !
  - We will reset your codes.

Tasks

- If you are absent from your lab,
  you can participate in another lab in the same week
  - However, if you take another lab, you get 50% of lab point as a penalty
  - If you don't participate in any other lab as well as your lab, your lab score for the week is zero
  - Absolutely no exceptions...
    - No e-mail evaluation for lab work
    - No evaluation for previous lab work
    - The only accepted excuse is your own death

Quiz

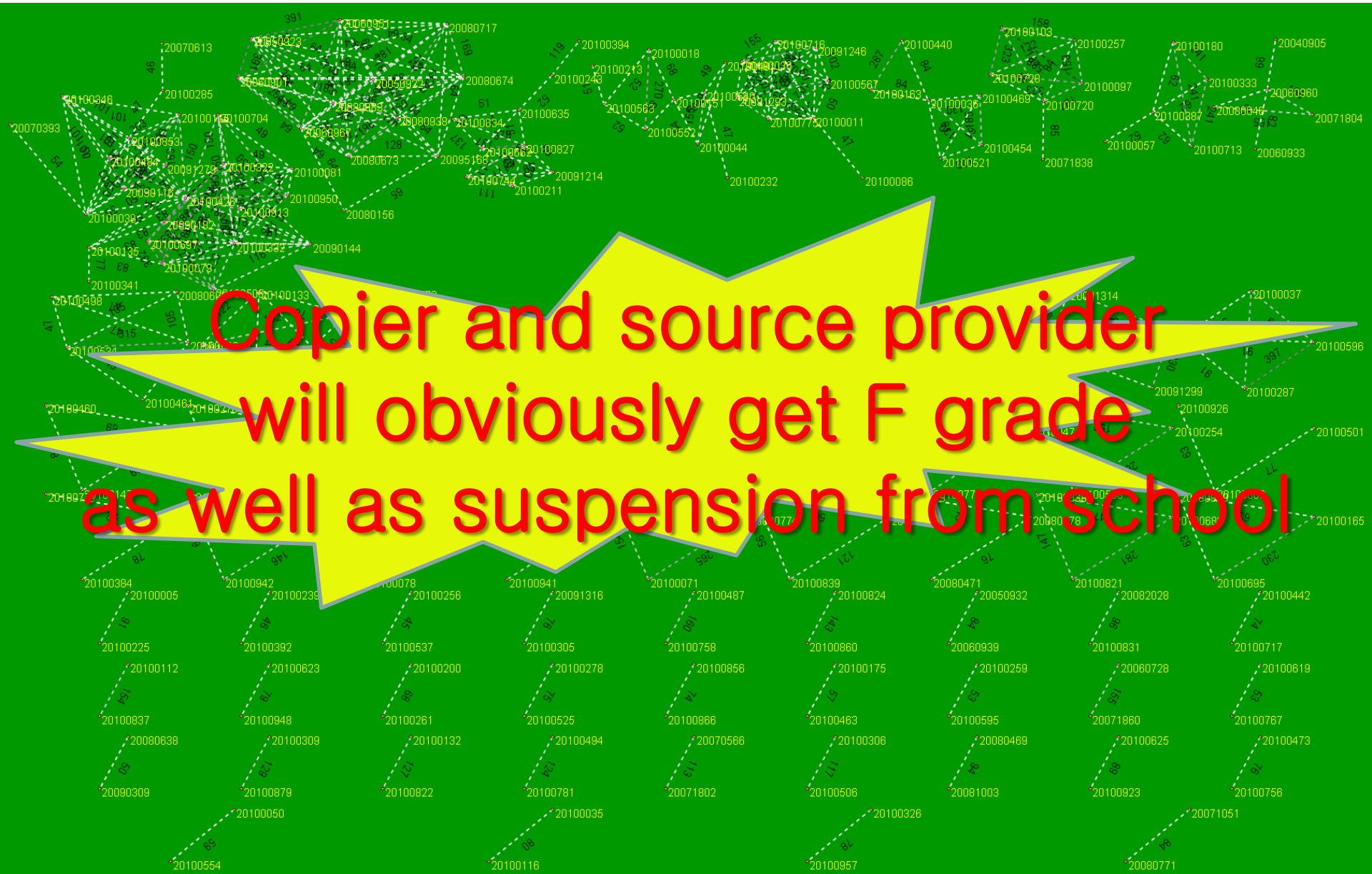
- There will be a **quiz time** in each lab
  - 4 points are assigned for quiz
  - If you don’t have a quiz, you can get 6 points for the lab attendance
  - Quiz will start at the beginning of the lab session.
  - So, please be on time !
- You have to concentrate on your lecture!
- Reviewing the lecture materials is recommended.
- We will have a practice quiz shortly.

Homeworks

- There will be 4 homeworks (50 practice points each).
  - No additional homework for the students who have not collected 340 practice points.
- Homework schedule is as follows.
  - HW#1: 03/13(Mon) – 03/22(Wed)
  - HW#2: 04/03(Mon) – 04/12(Wed)
  - HW#3: 05/01(Mon) – 05/10(Wed)
  - HW#4: 05/22(Mon) – 05/31(Wed)
- The details will be announced when each homework is released.
- If you are faced with some problems when you are trying to solve your homework,
  - **Do not copy your friends' homework**
    - Even just copying only one method, it's also regarded as cheating
  - **Ask TAs to help you**.

    Use TA's office hour!

Cheating


Copier and source provider
will obviously get F grade
as well as suspension from school

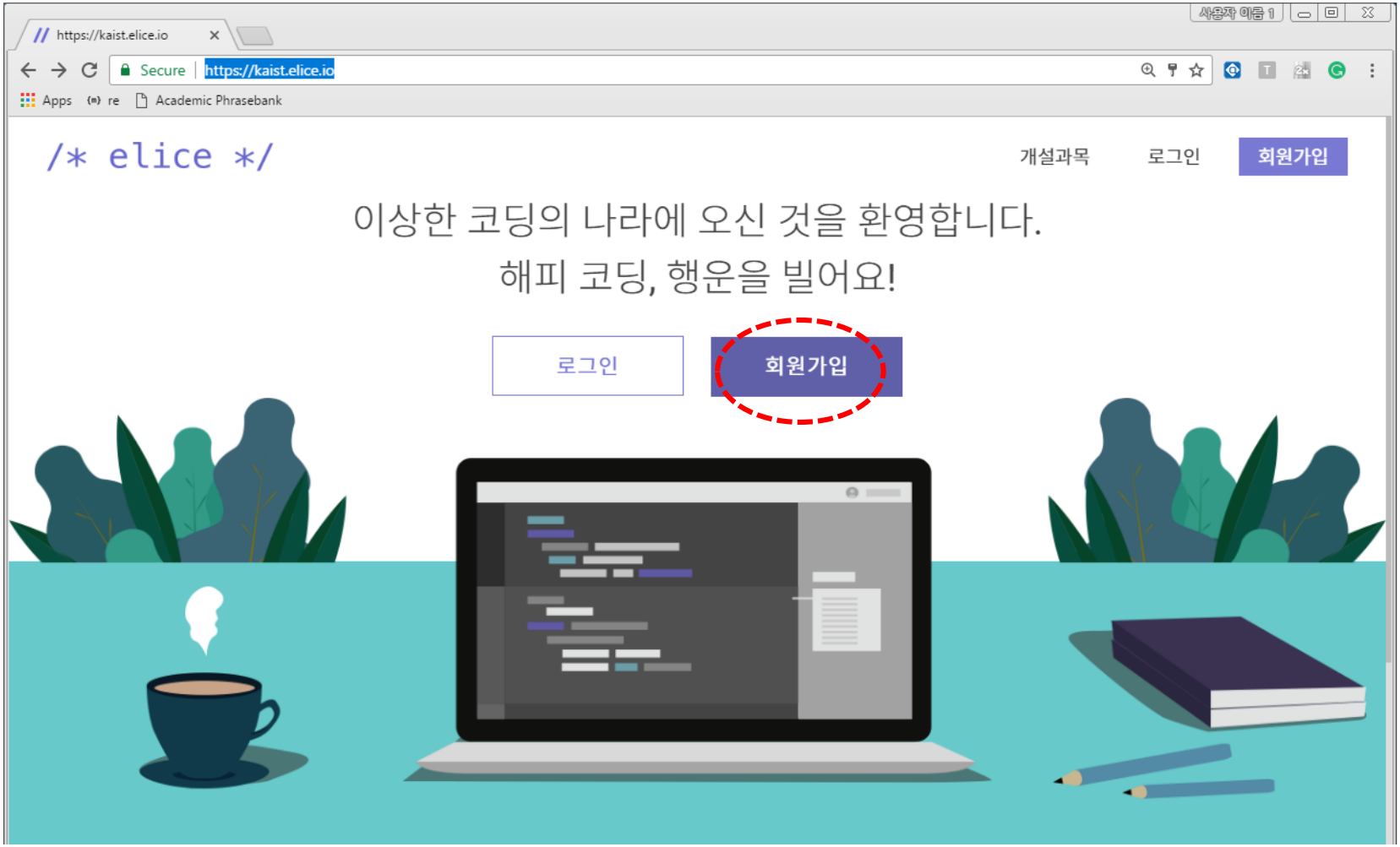
TA's Office Hour

- TA's office hour schedule is as follows.
  - Creative Bldg. #307, 21:00 ~ 22:30
  - Marked as "OH" in course schedule
    - 03/20(Mon), 03/21(Tue), 03/22(Wed), 03/23(Thu), 03/24(Fri)
    - 04/10(Mon), 04/11(Tue), 04/12(Wed), 04/13(Thu), 04/14(Fri)
    - 05/29(Mon), 05/30(Tue), 05/31(Wed), 06/01(Thu), 06/02(Fri)
    - 06/05(Mon), 06/07(Wed), 06/08(Thu), 06/09(Fri)
- You can ask
  - Lecture
  - Lab
  - Homework
  - Something you want to know
    - CS101
    - University life
    - ETC

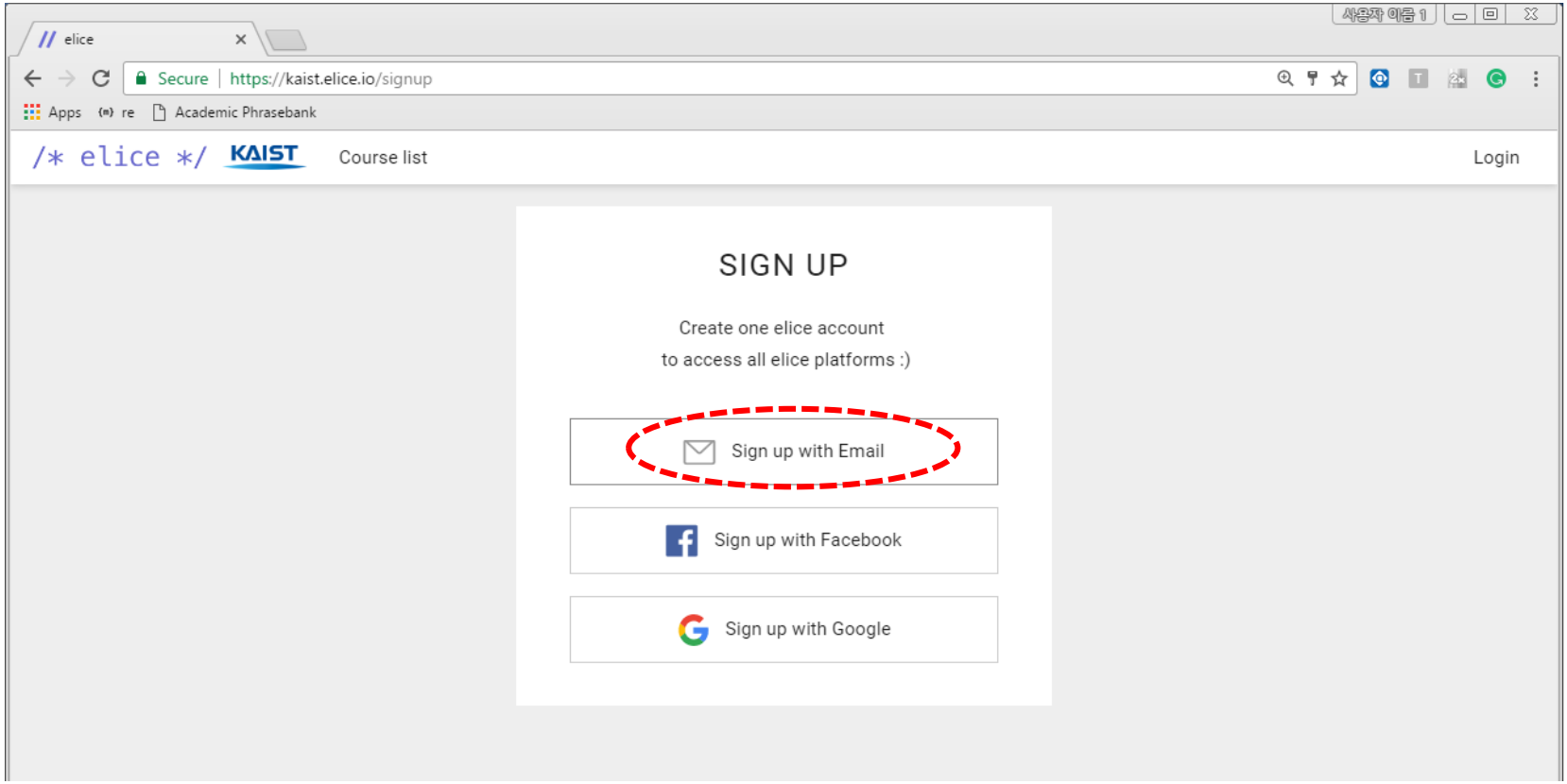
CS101 homepage

- During the semester, we use elice as our homepage
  - https://kaist.elice.io/
- Check elice at least once a day not to miss an important notice
  - HWs
  - Change of schedule
  - Claim period
  - Term exam
- Join the elice as a student member
- Write your identification correctly
  - Real name
  - KAIST email address
  - Student ID number

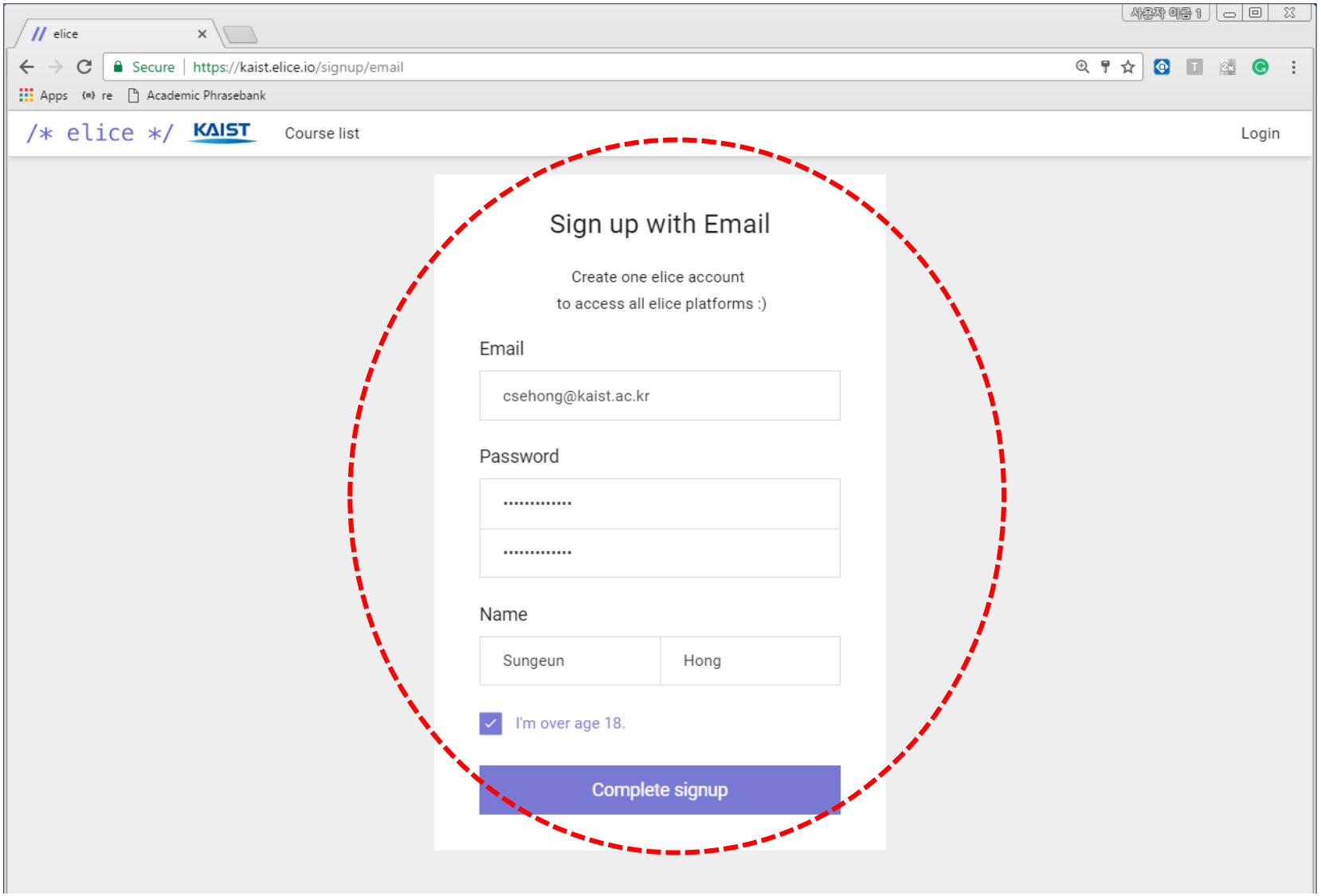
Sign up steps (1)



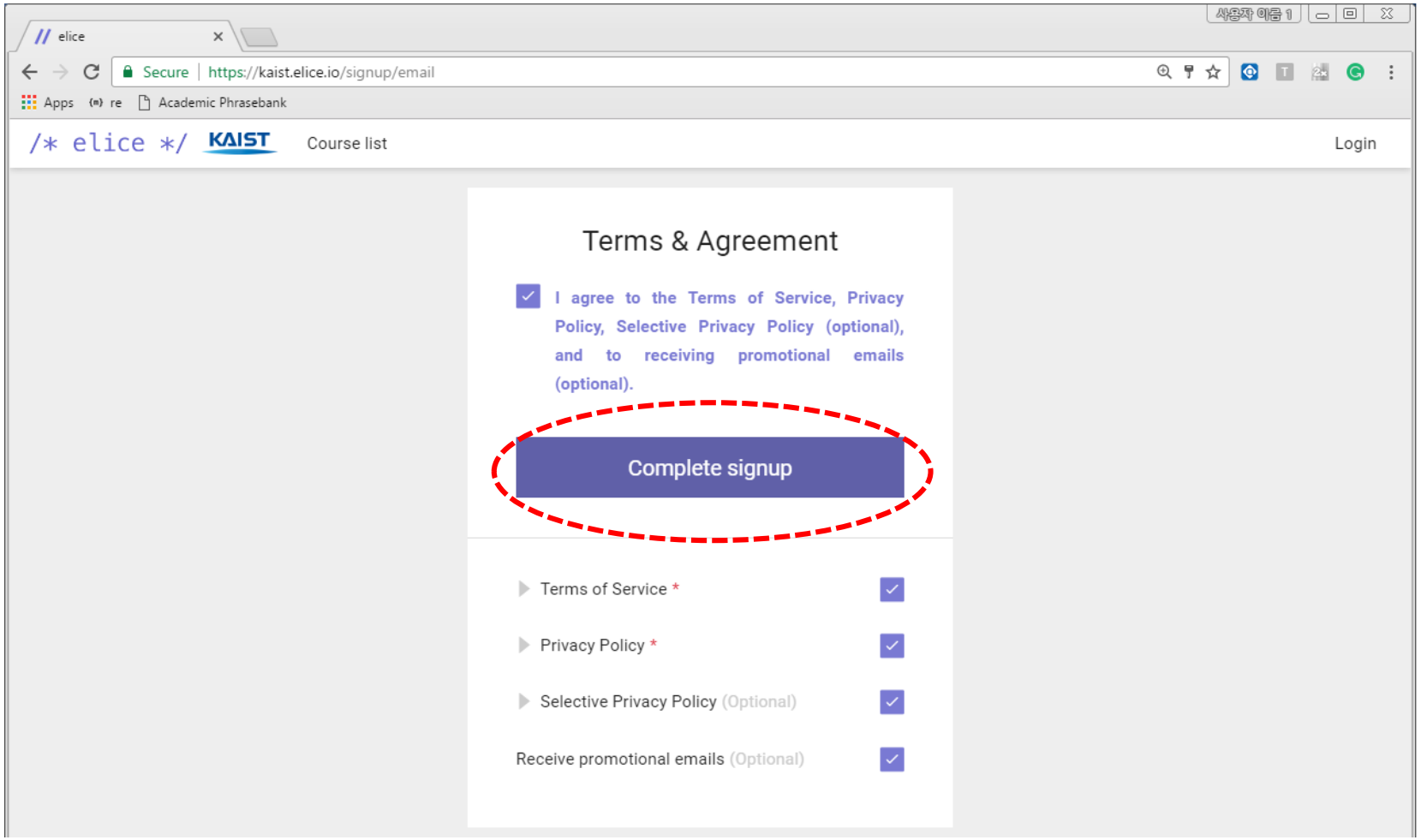
Sign up steps (2)



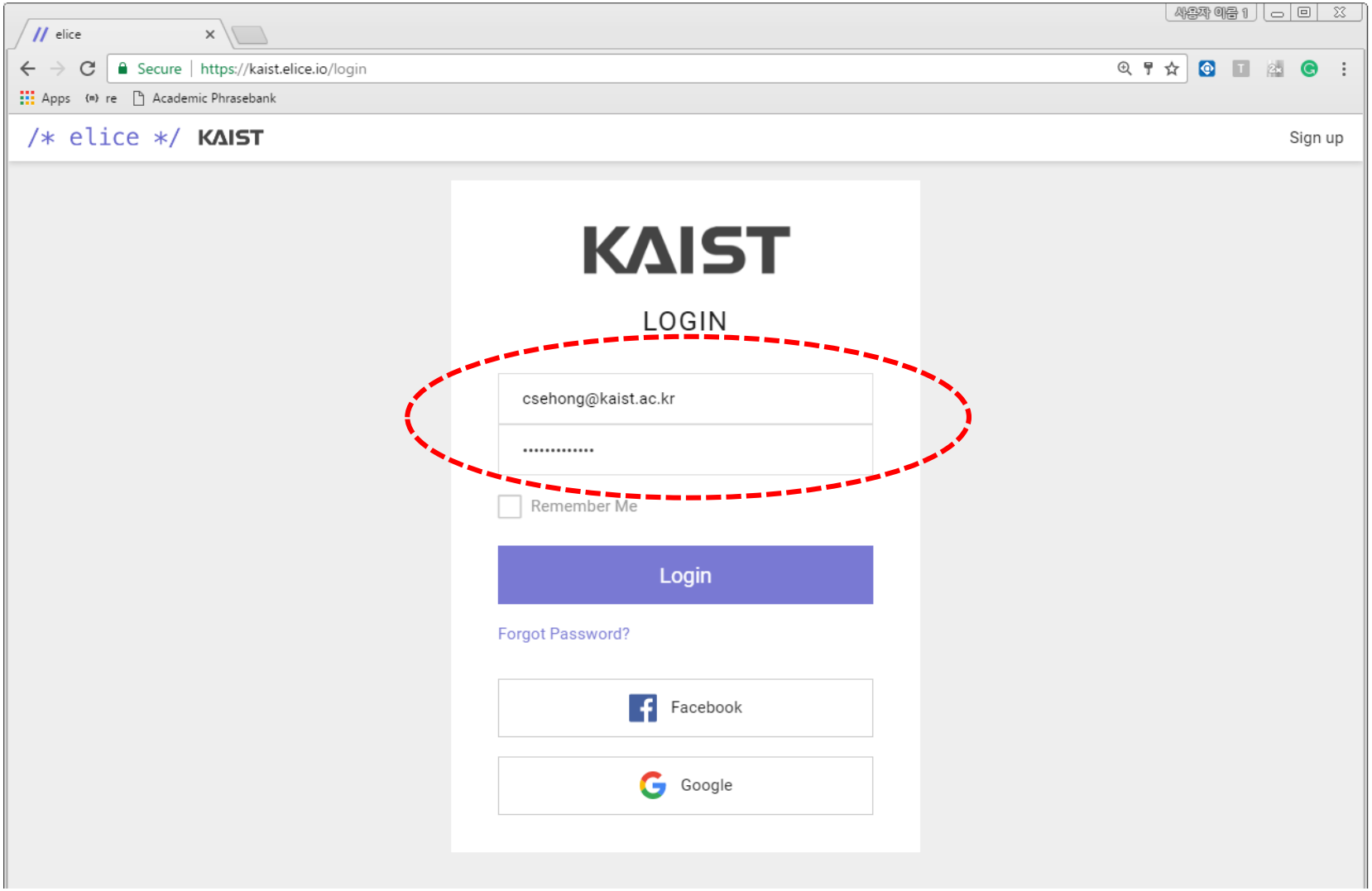
Sign up steps (3)



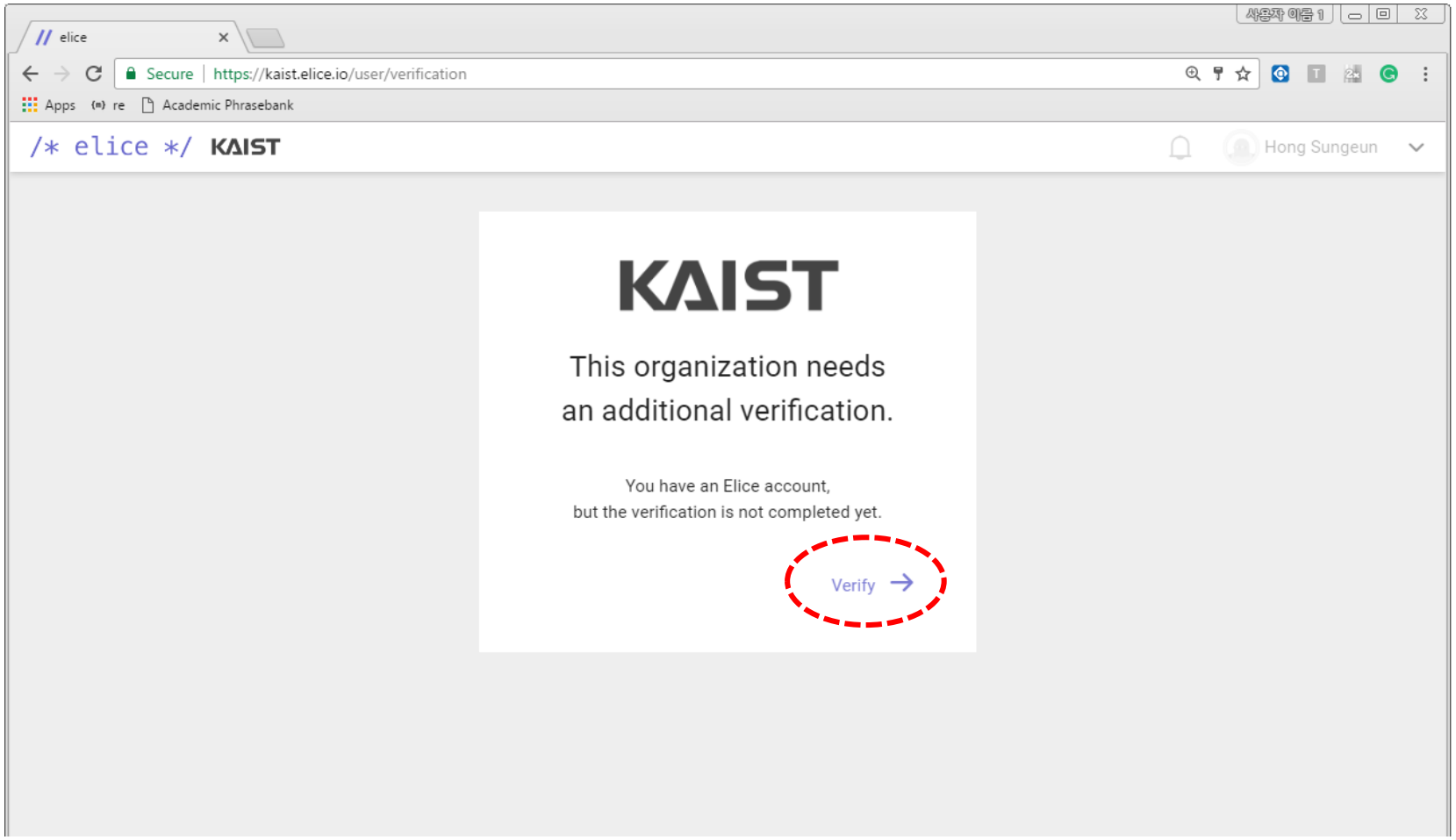
Sign up steps (4)



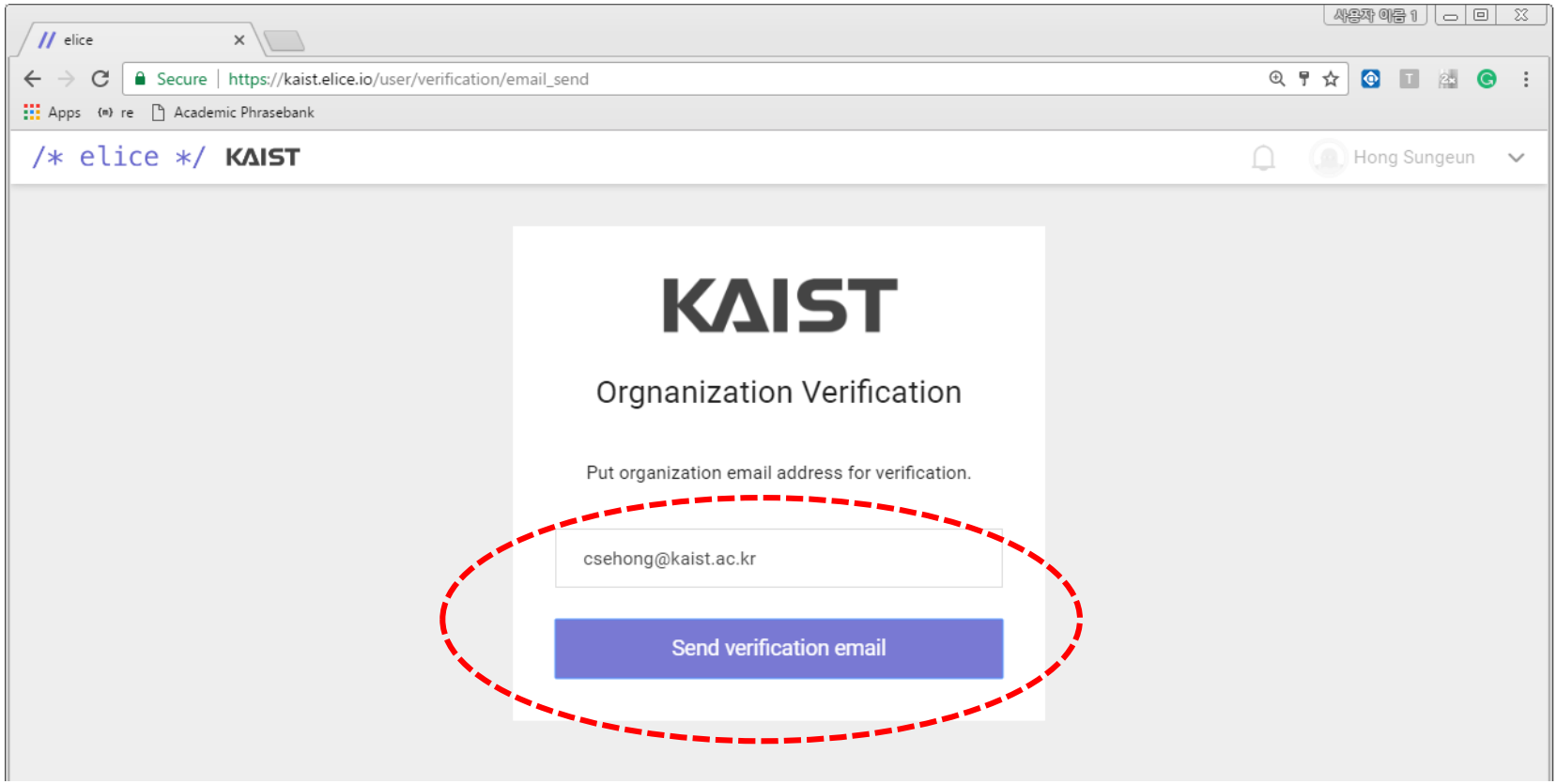
Sign up steps (5)



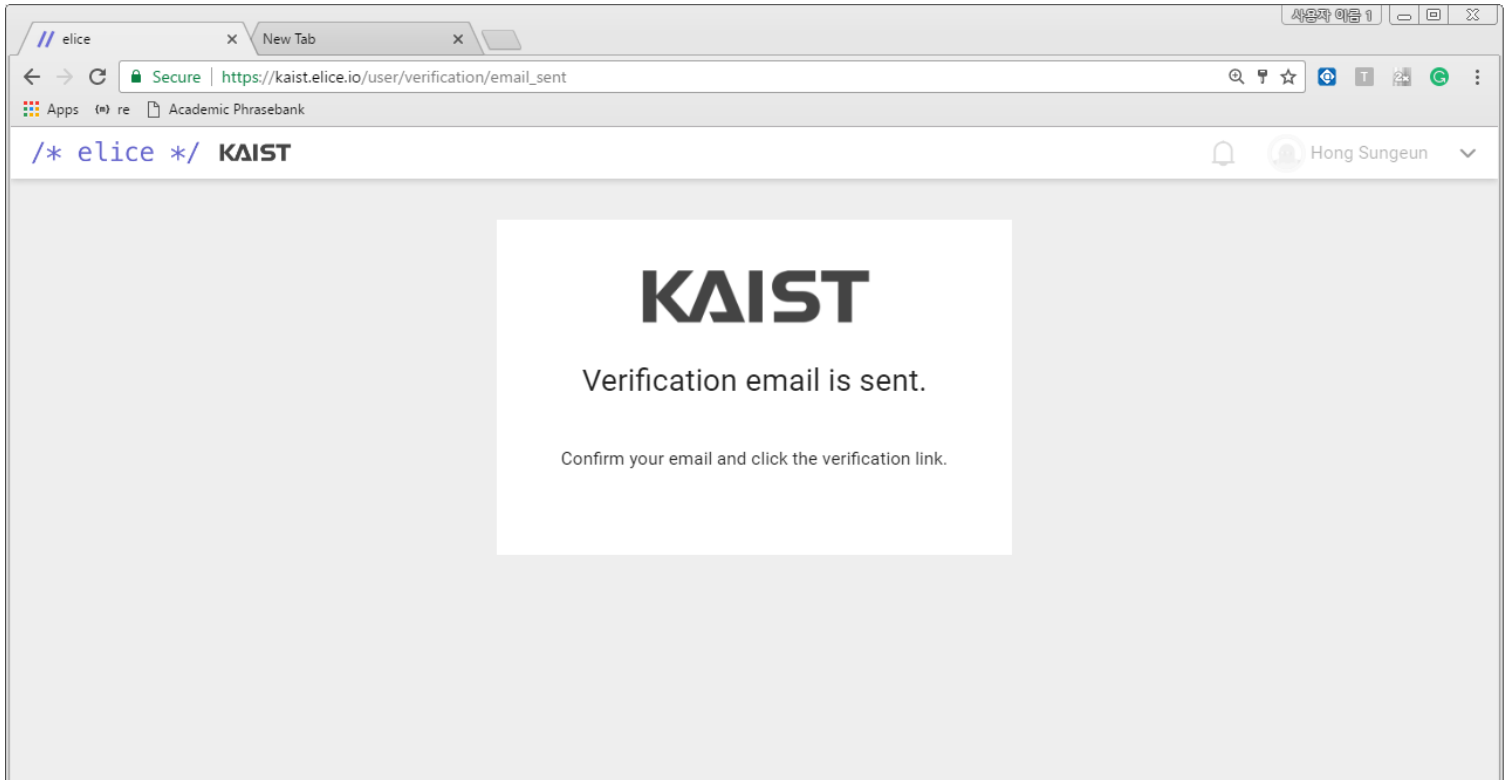
Sign up steps (6)



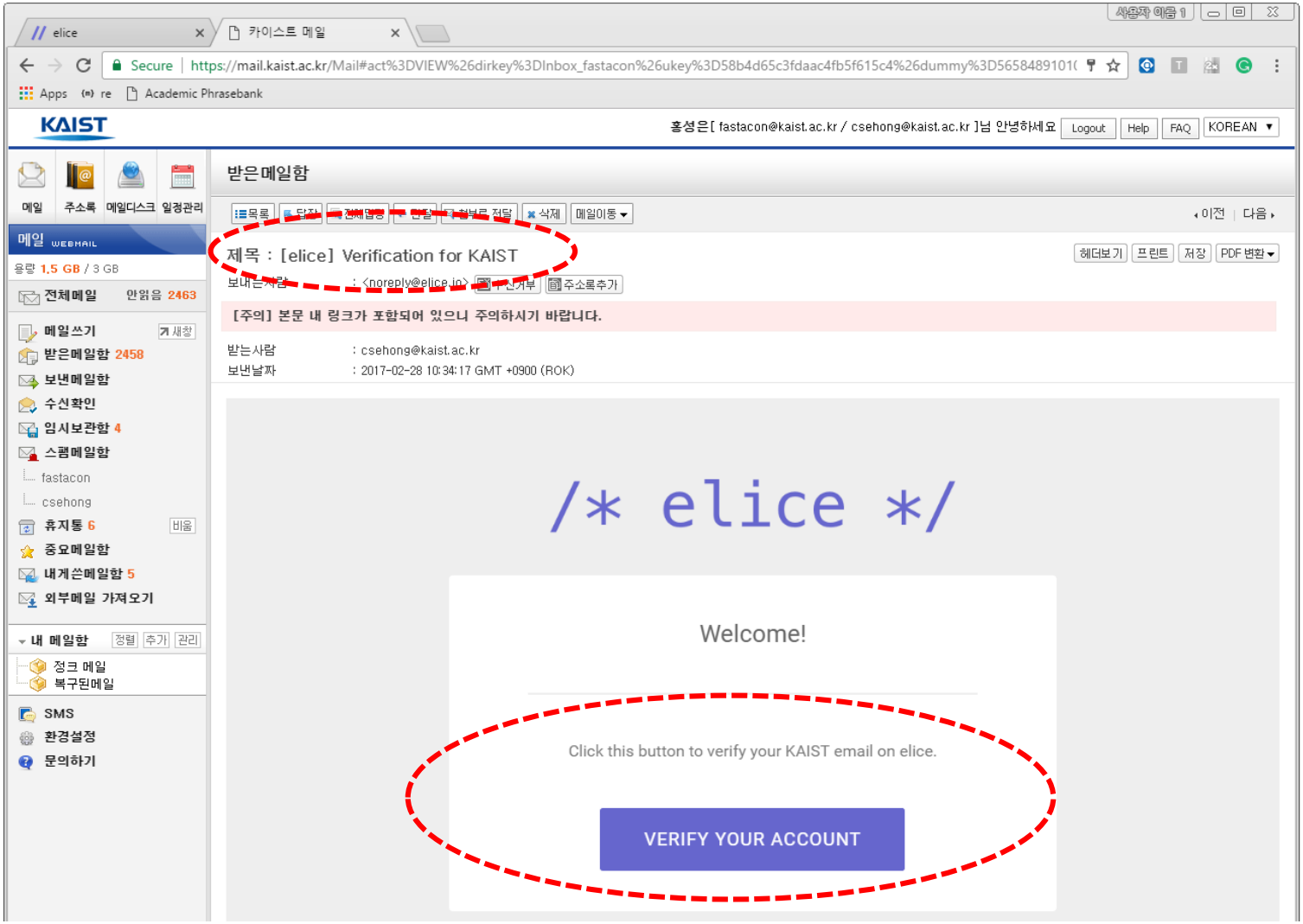
Sign up steps (7)



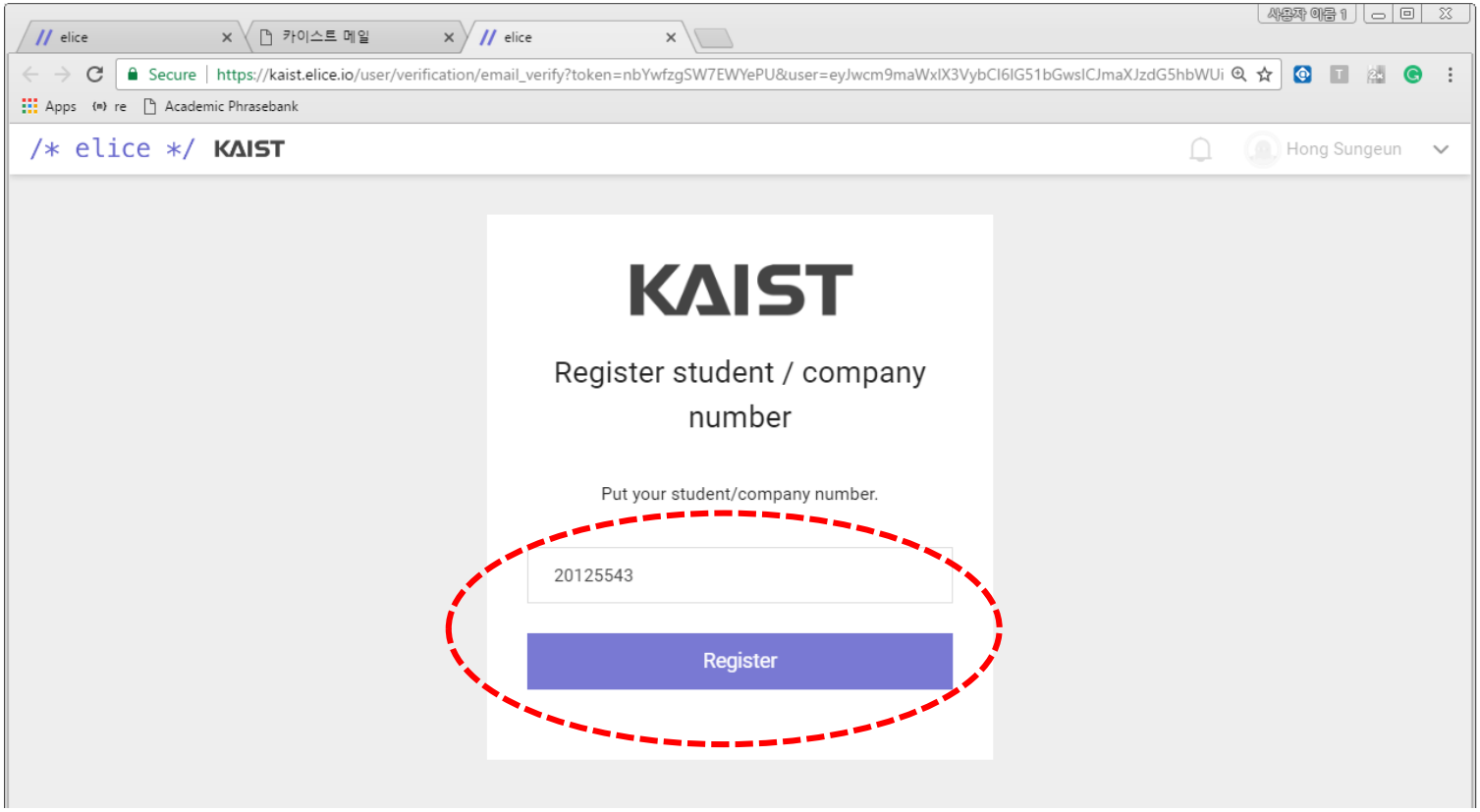
Sign up steps (8)



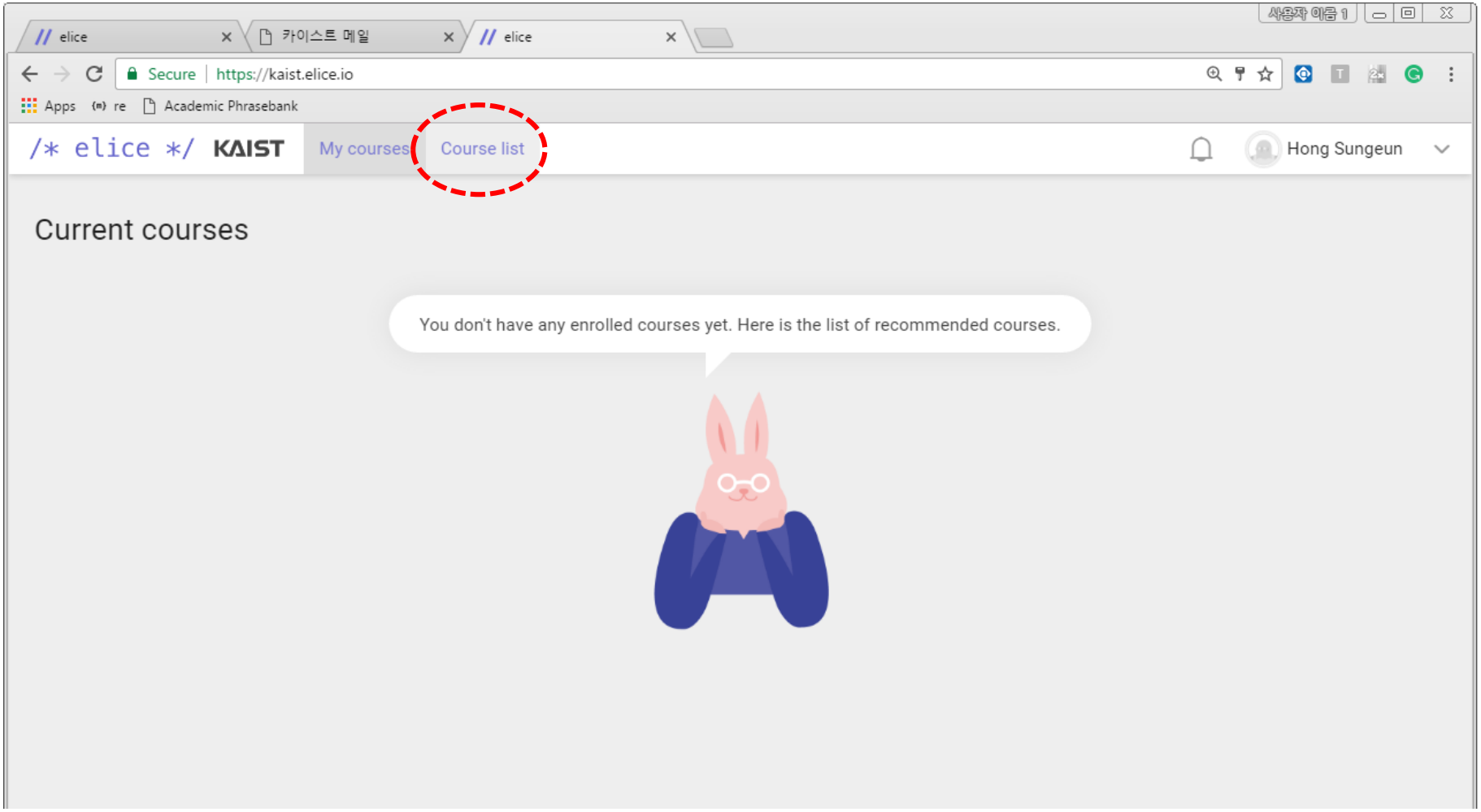
Sign up steps (9)



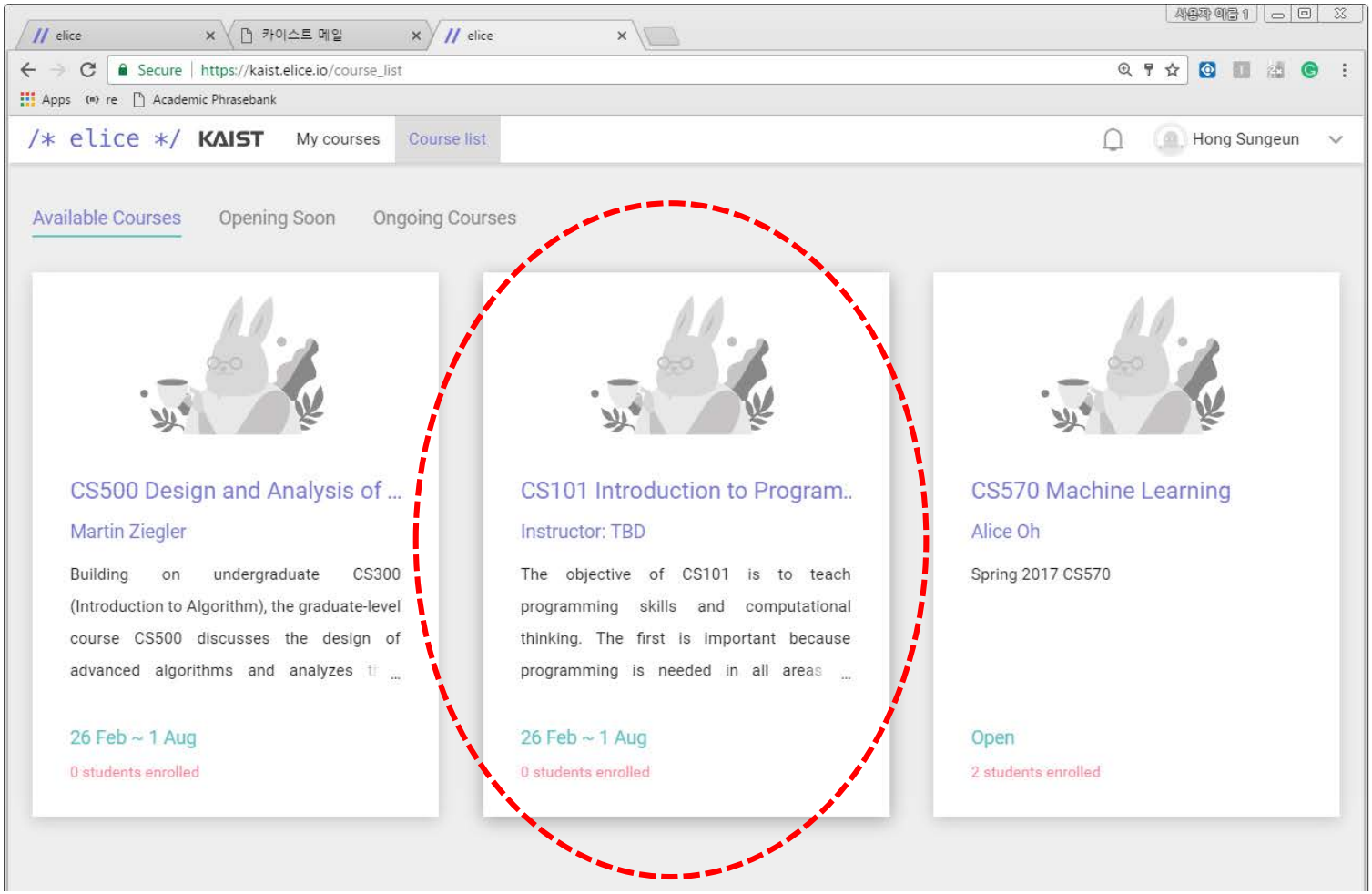
Sign up steps (10)



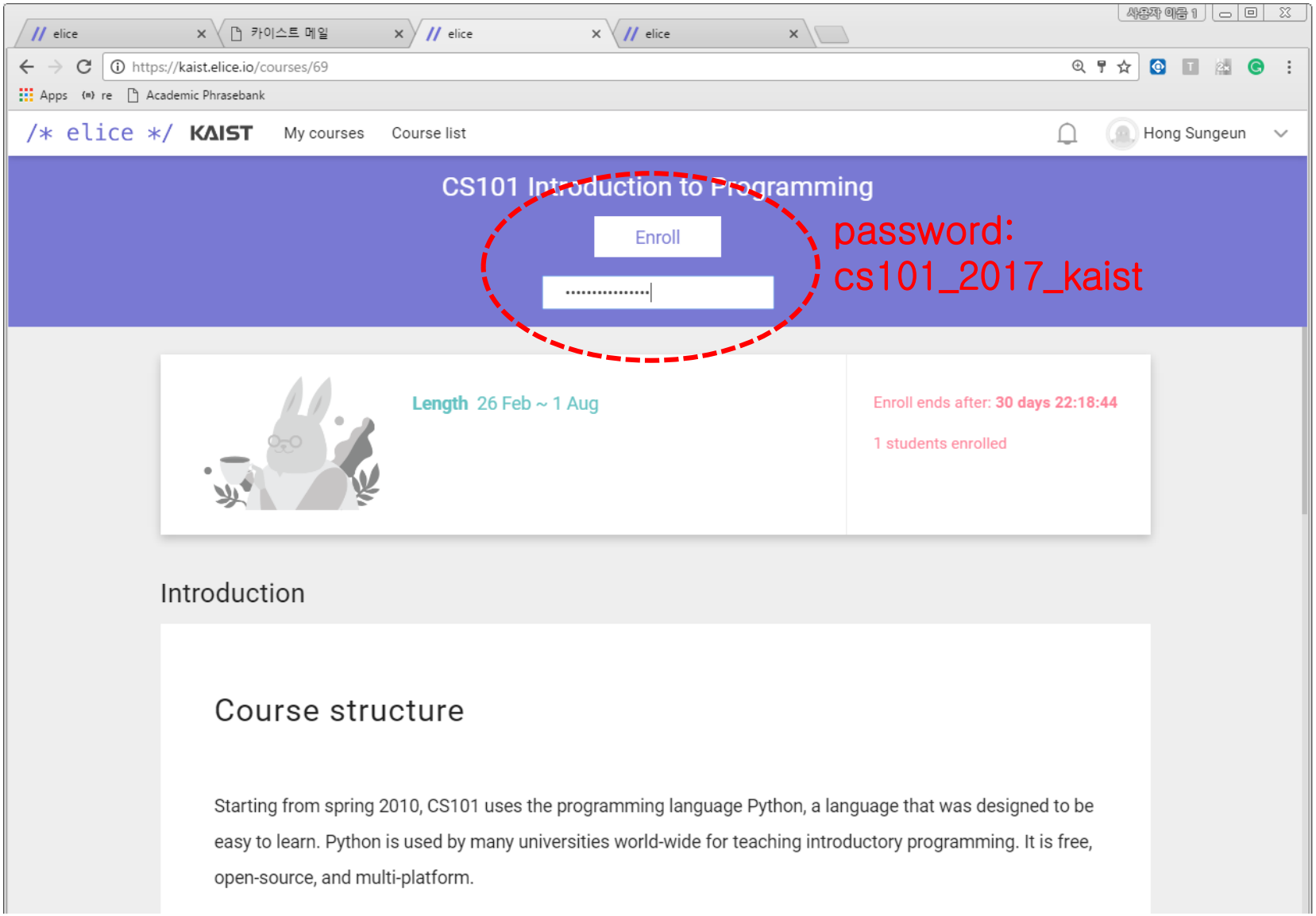
Sign up steps (11)



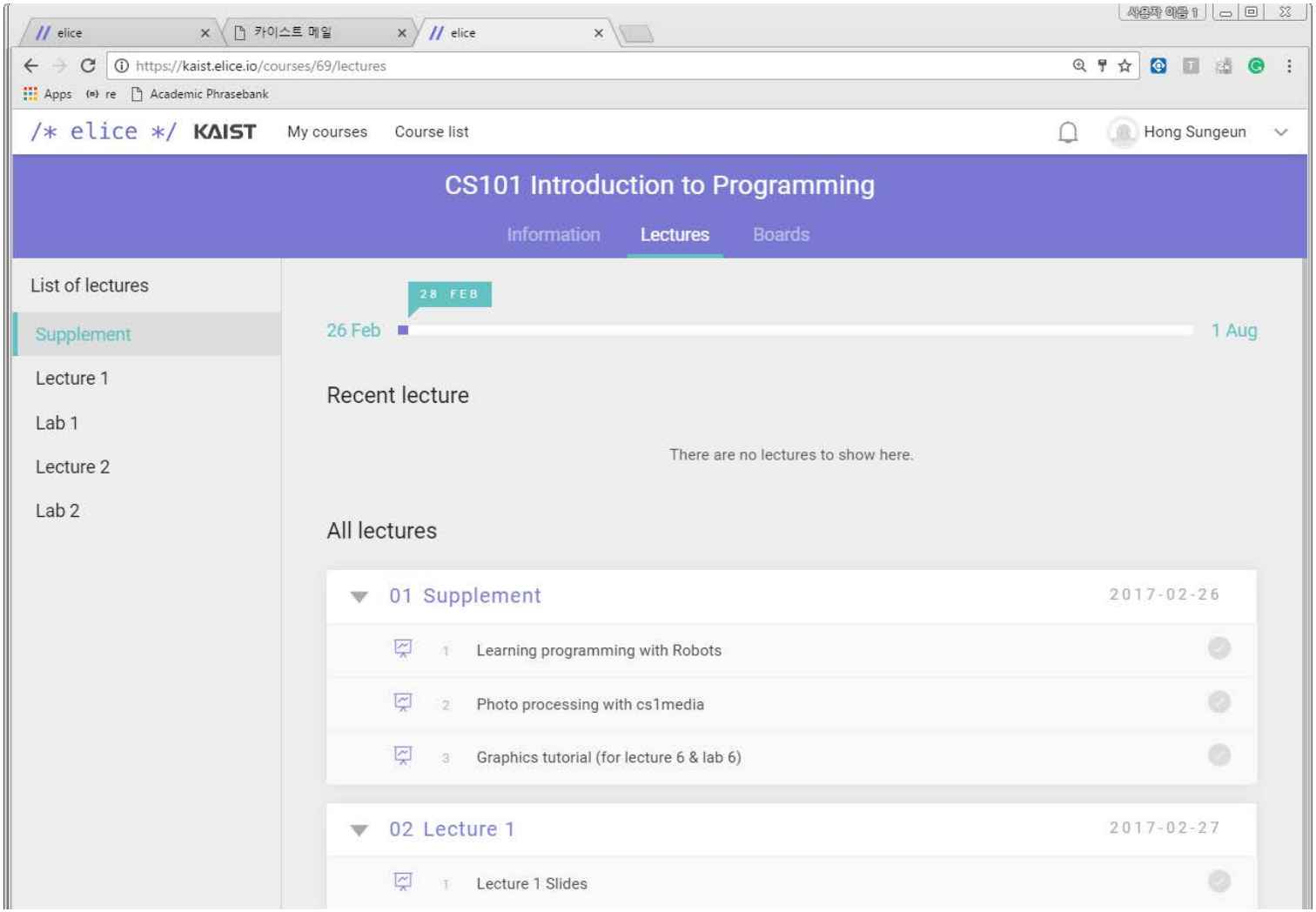
Sign up steps (12)



Sign up steps (13)

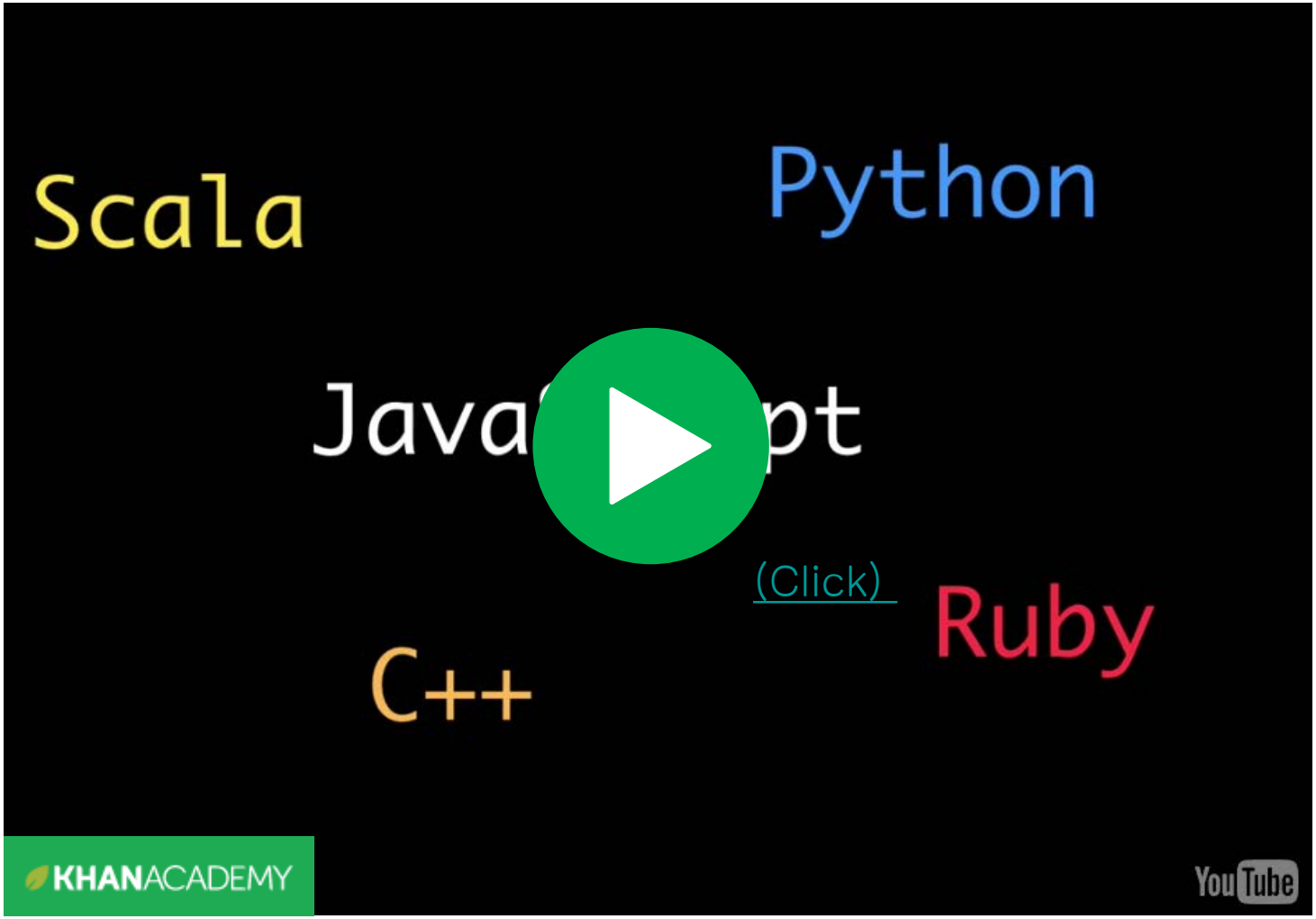


Sign up steps (14)

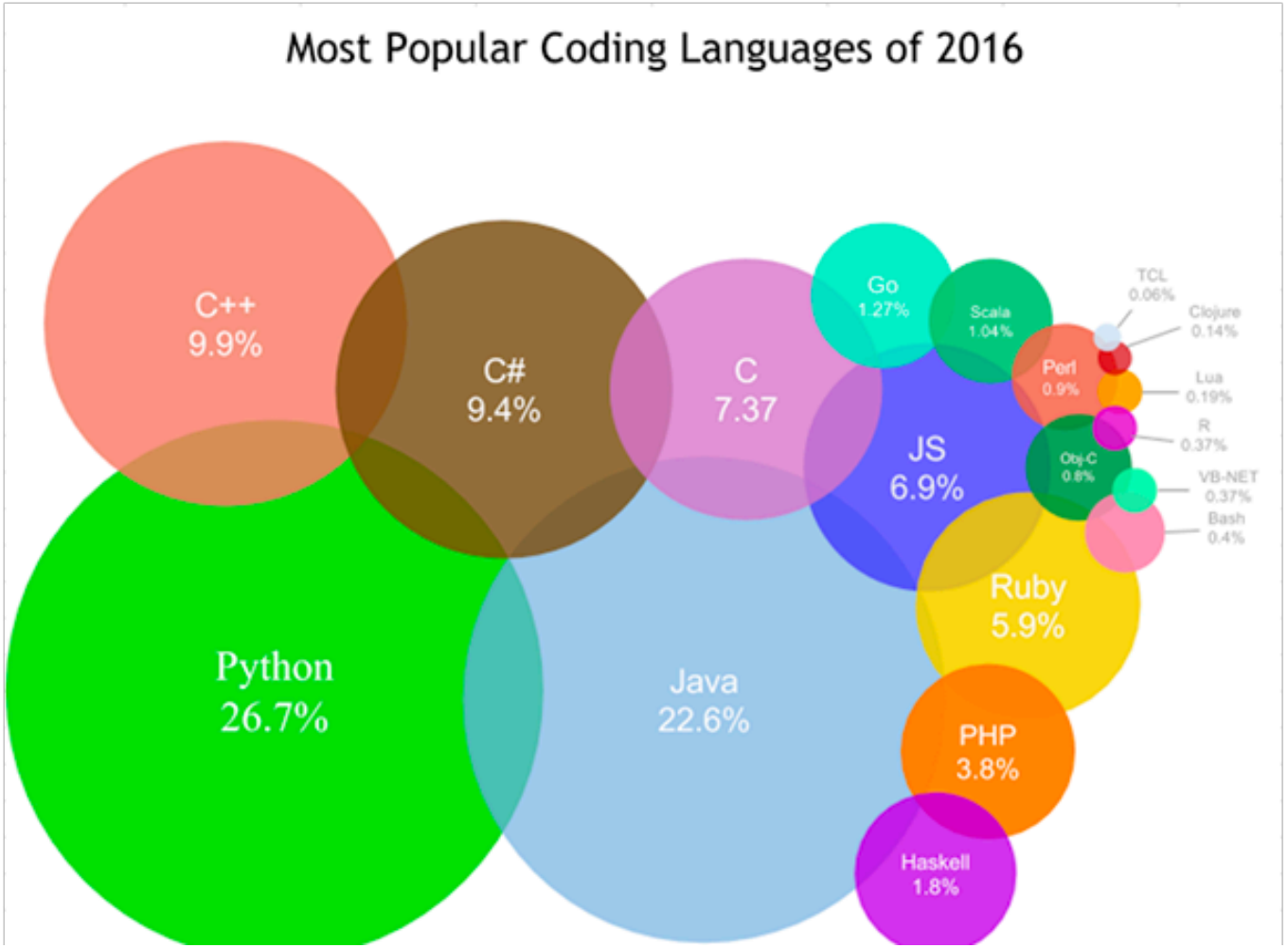


Programming

What is programming?



Python

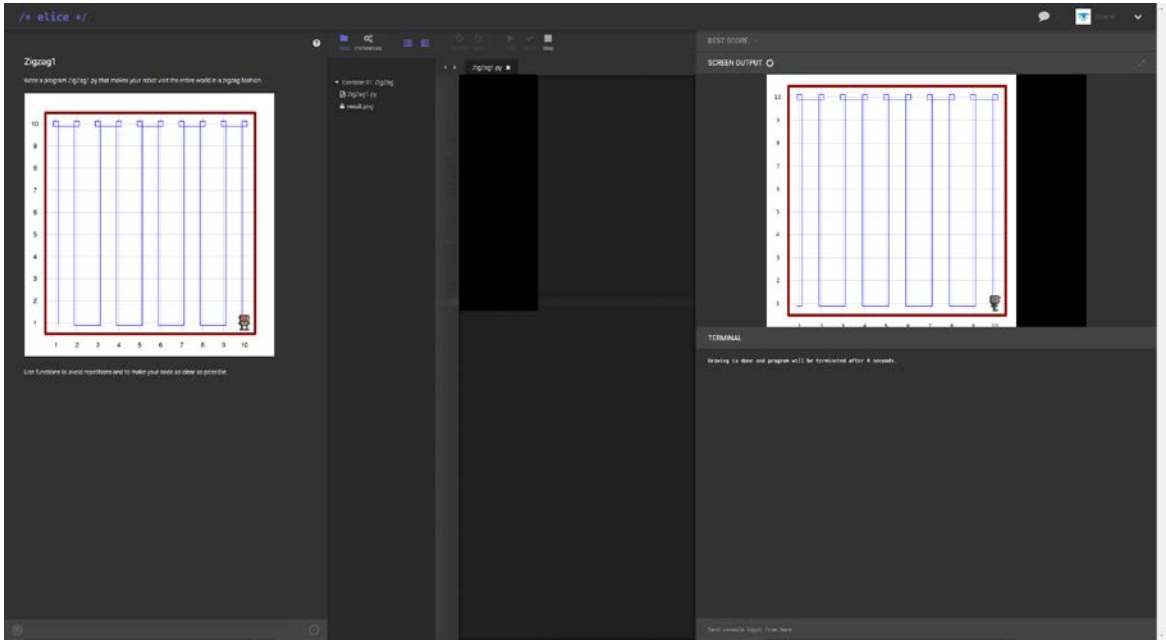

Most Popular Coding Languages of 2016
C++
9.9%
C#
9.4%
C
7.37
Go
1.27%
Scala
1.04%
TCL
0.06%
Clojure
0.14%
Perl
0.9%
Lua
0.19%
R
0.37%
Obj-C
0.8%
VB-NET
0.37%
Bash
0.4%
JS
6.9%
Ruby
5.9%
Python
26.7%
Java
22.6%
PHP
3.8%
Haskell
1.8%

Python

- Programming language
- https://www.python.org
- Two versions
  - Python 2.x, Python 3.x
  - Python 2.x is legacy, Python 3.x is the present & future of the language
  - We choose Python 3 in CS101 course
- Used in
  - Scientific computation
  - Many universities for introductory courses
  - From embedded platforms to computer games
  - TensorFlow (Deep learning)

Elice

- Online programming education platform
- Used in
  - CS206 Data structure
  - CS570 Machine learning
  - Machine learning summer school
- In CS101 course, we also use Elice
  - Lab tasks
  - Quiz
  - HWs
- https://kaist.elice.io/

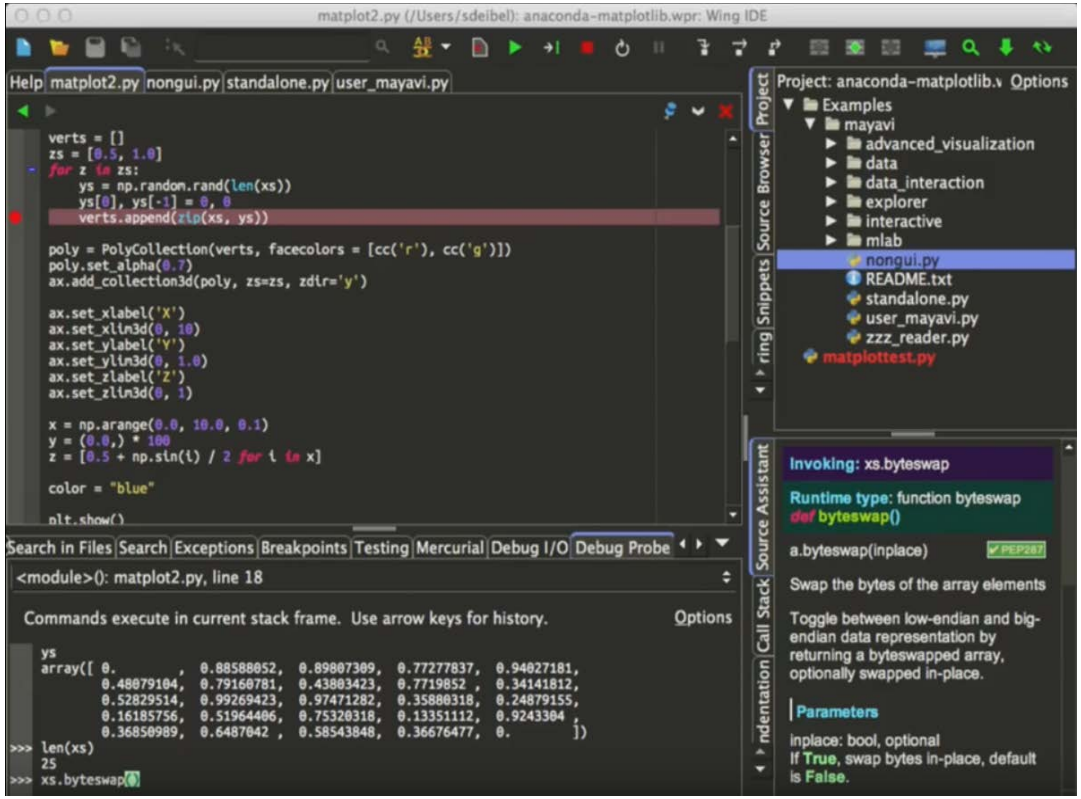


A screenshot of elice platform

Integrated Development Environment (IDE)

- A software application that provide comprehensive facilities to computer programmers for software development
  - Source code editor
  - Build automation
  - Debugger
  - Documents

- IDEs for Python
  - Wing IDE
  - PyCharm
  - Eclipse with PyDev
  - Vim
  - Emacs

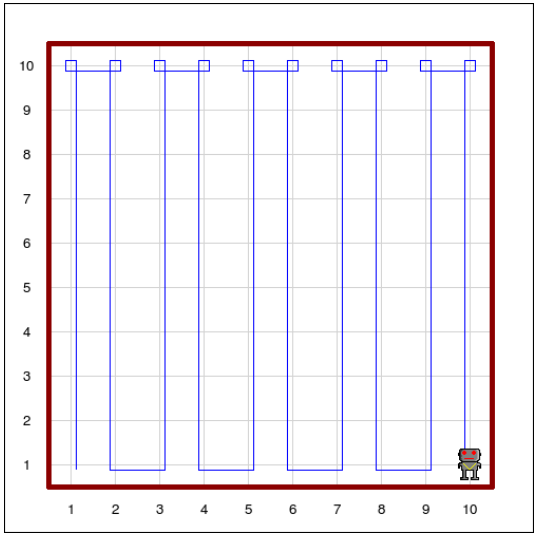


A screenshot of Wing IDE

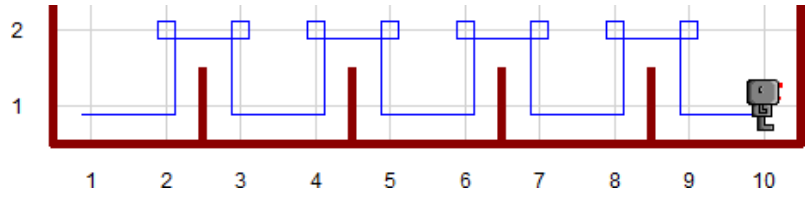
Tasks

Tasks

- Practices with functions and for-loops
- Task#1: ZigZag
  - Create a default world.
  - Add a robot.
  - Make the robot visit the entire world in a zigzag fashion.

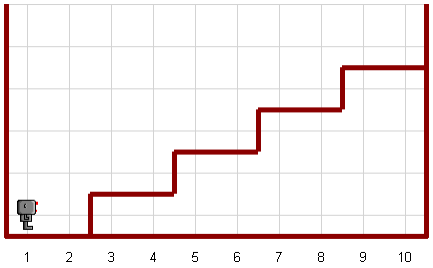


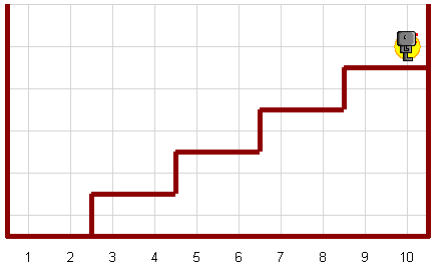
- Task#2: Hurdle
  - Load the world named ‘hurdles1.wld’.
  - Add a robot.
  - Make the robot jump all hurdles and pick up the beeper.

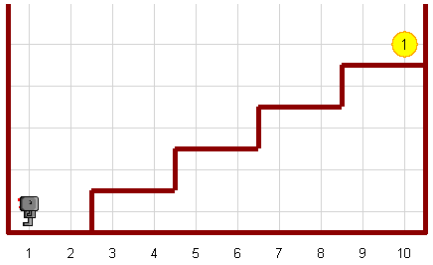


Tasks

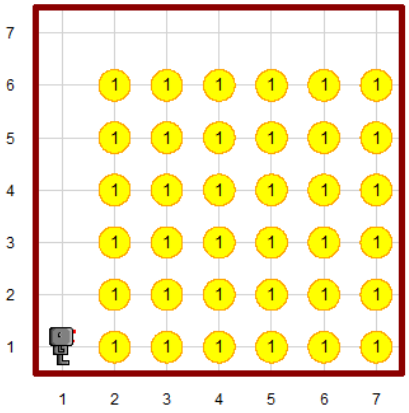
- Task#3: Newspaper Delivery
  - Load the world named ‘newspaper.wld’.
  - Add a robot with a beeper.
  - Make the robot deliver newspapers and return to his starting point.





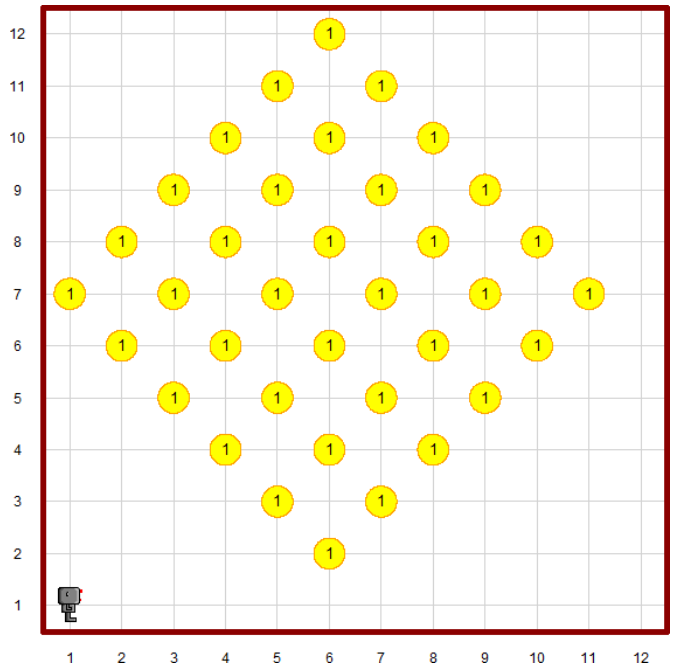


- Task#4: Harvest
  - Load the world named ‘harvest1.wld’.
  - Add a robot.
  - Make the robot harvest all the carrots.



Tasks

- Task#5: Harvest Again
  - Load the world named ‘harvest2.wld’.
  - Add a robot.
  - Make the robot harvest all the carrots via the shortest path possible.



Comment

- We use *comments* for other humans only inside the program
  - To embed programmer-readable annotations
  - To make the source code easier to understand
- If a line starts with a hash symbol #, then this line is a *comment* and will be ignored by the Python interpreter:

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

# This line should be ignored!
```

Any Questions?