Programming Assignment Tutorial

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Programming Assignment

- Assignments are related to lecture contents

- You will take 7-8 programming assignments
  · 3-5 problems for each assignment
  · You will have 1 week per assignment

- Programming language
  · C/C++   gcc/g++ 9.4.0
  · Python 3.8.10

- We also have offline programming mid-term and final exam
  · You can use all the meterials on domjudge site at exam

Introduction of Domjudge

- Domjudge system
  · https://domjudge.postech.ac.kr
  · Submit your code at here
  · Real-time evaluation
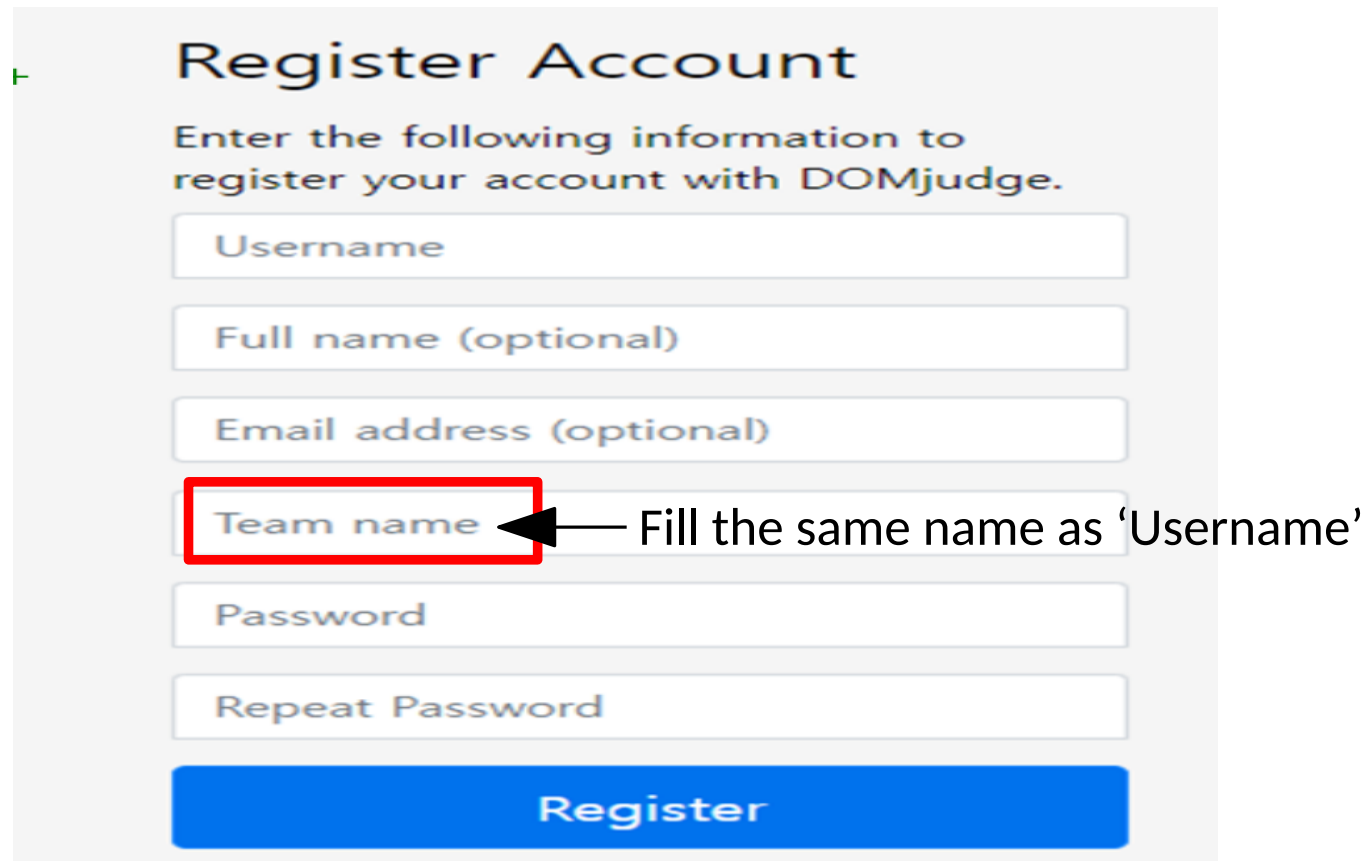
- Enter the domjudge site and click "Domjudge"
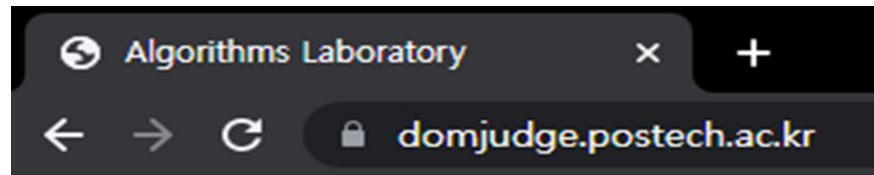
Registration

- Click "Login" and "Register now"
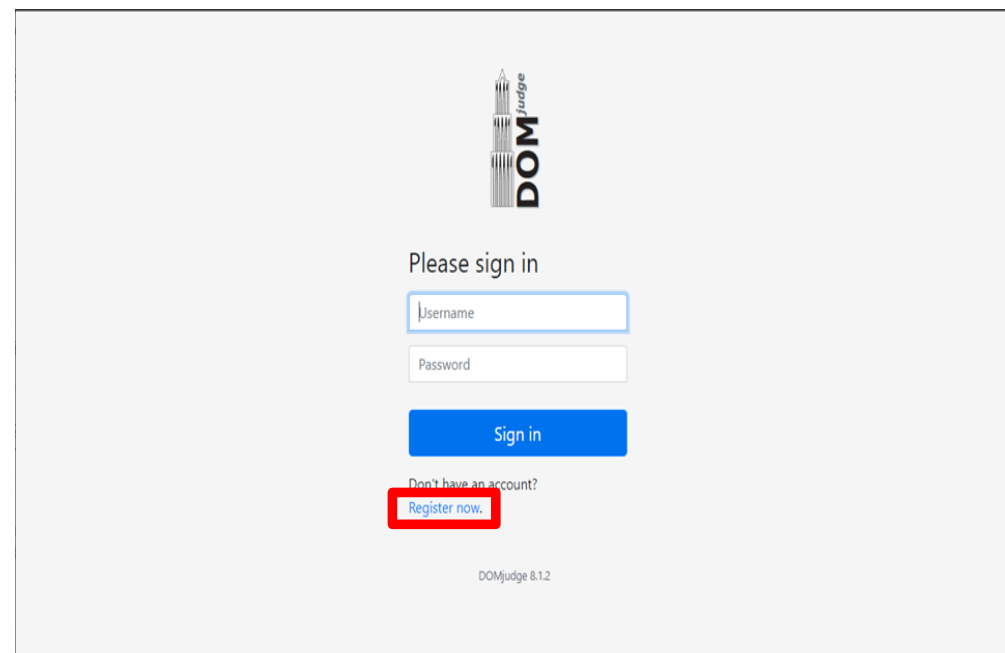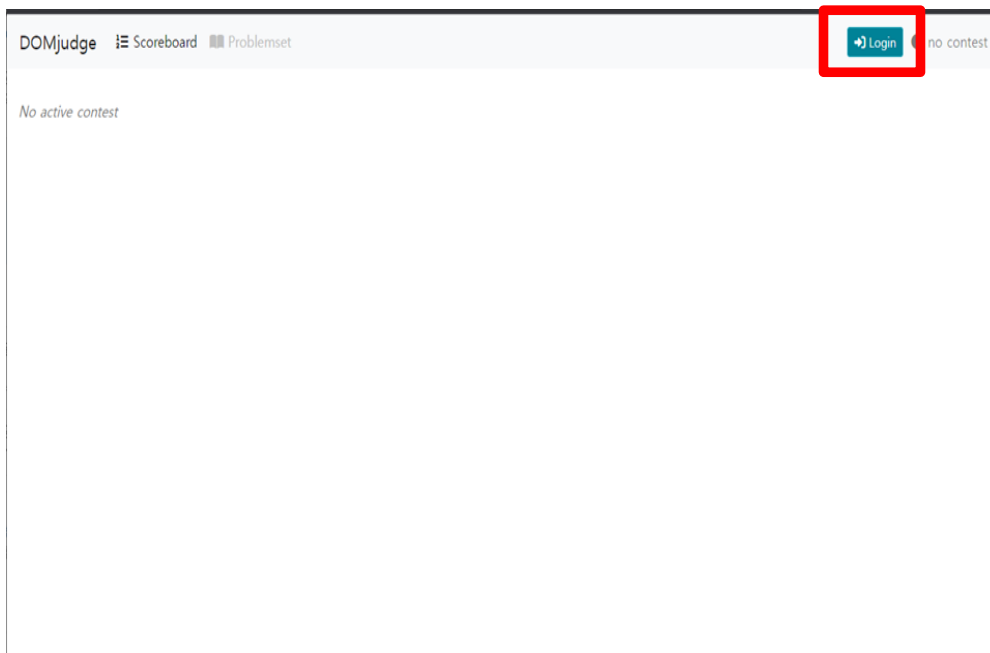
- Register your own ID
  · You don't have to fill 'Full name' and 'Email address'
  · After registration, please answer the Goolge sheet
    https://forms.gle/xF7wiRvmMMzz2pLj7

Register Account

Enter the following information to register your account with DOMjudge.

Username

Full name (optional)

Email address (optional)

Team name ← Fill the same name as 'Username'

Password

Repeat Password

Register

Domjudge Home

- After logging in
  - ①: Links to main page of Domjudge
  - ②: You can select assignments
    Now you will face sample contest 'assn0'

- Access problem text
  · ①: 'Problemset' button will lead you to this page
  · ②: You can access each problem text here

Read Problem Carefully!

- Otherwise, you might be solve WRONG problem.

- Or, you will solve the problem in wrong way.
  · Problem statement guides time complexity you should achieve.

- Also, you should keep the input/output statement.

A+B

Description
Write a program that takes two integers A and B from the standard input (stdin) and print an integer $A + B$ to the standard output (stdout).

Input Statement
- First line contains T which indicates the number of test cases.
- Each following T lines contains a test case consisting of two integers A and B ($-2^{31} \leq A, B < 2^{31}$).

Output Statement
The program should print $A + B$ for each input. Each output should be separated by empty line.

Input Example
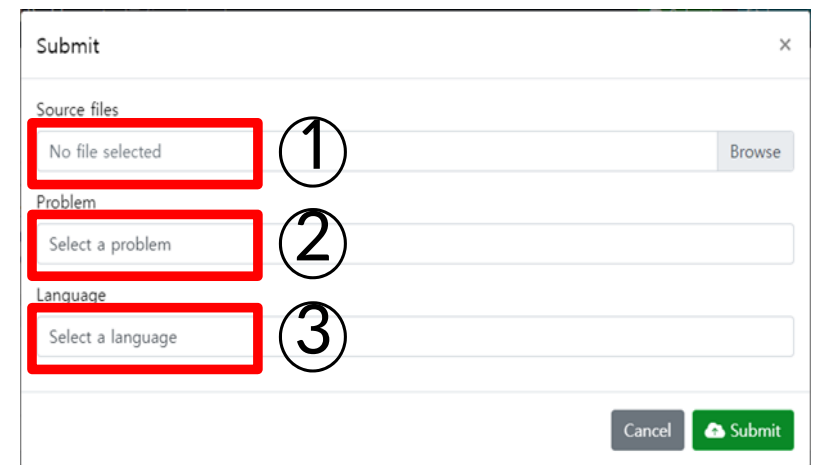```
4
1 2
3 4
5 6
7 8
```

### Output Example
```
3
7
11
15
```

### Time Limit: 1 second

# Submit Code

- Submit button will show you the submission pop-up window
  - ①: Select source file in your computer
  - ②: Select problem
  - ③: Select language

**The file name must be English without spacing!**
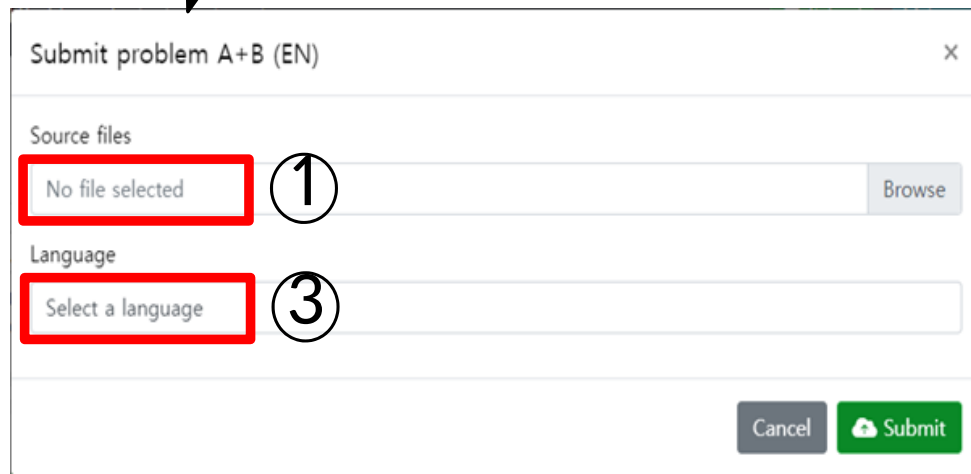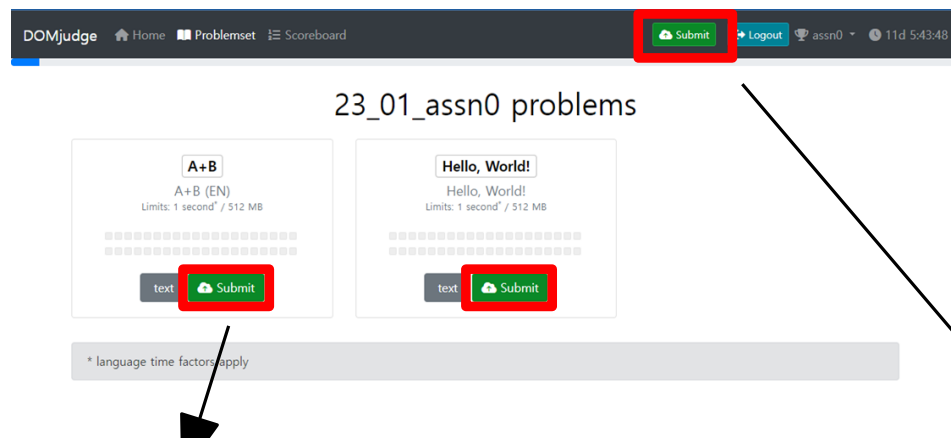
# Submission Results

- You can check your submission results from homepage
- You can submit your code infinitely many times
  until the due date
- <span style="color:red">The number of submissions is not included in your grade</span>

# Submission Results

PENDING : The system is evaluating your program. Wait and press F5 to check your result. If it takes too long, ask us.

COMPILER-ERROR : There was an error during compilation of your code.

RUN-ERROR : There was an error during running your program. You should check whether there was index out of range, stack overflow, wrong input format, etc.

NO-OUTPUT : There was no output from your program.

WRONG-ANSWER : Output of your program doesn't match with the answer.

TIMELIMIT : Your program failed to be terminated in timelimit. Write more efficient program.

TOO-LATE : Your submission was posted after the end of deadline.

CORRECT : Correct answer! Congratulations!!

# Usual Errors

- Copiler version: gcc/g++ 9.4.0, python 3.8.10

- Index out of range: check the size of array(list)

- Memory exceed: you cannot use memory larger than 512MB

- Segmentation fault: similar to 'index out of range'
    - Occurred in dynamic memory allocation

- (Python3) Maximum recursion depth exceed: add below code
    - import sys
    - sys.setrecursionlimit(*[number]*)

- Domjudge does not support external libraries
    - ex) numpy

- Exception handling for degenerate cases
    - We cannot give you test case files.

# Time Complexity Tip

- Time complexity in problem solving
  - The maximum size of input gives you the hint of the time complexity to get corret
  - Table shows the scale of computation corresponding to time complexity and size of input.

| input size ($n$) | time complexity | | |
|---|---|---|---|
| | $O(n^3)$ | $O(n^2)$ | $O(n \log n)$ approx. |
| 100 | 1,000,000 | 10,000 | 1,650 |
| 1,000 | 1,000,000,000 | 1,000,000 | 16,500 |
| 10,000 | 1e+12 | 100,000,000 | 165,000 |
| 100,000 | 1e+15 | 10,000,000,000 | 1,650,000 |

3GHz = 3,000,000,000 instructions / second

- Assn0 is not scored. It is just a tutorial. sorry :)

- Each correct problem, you get 1 point!

- There is no partial score. sorry :)
  - 1 CORRECT, 1 POINT
  - Otherwise, 0 POINT

# Notice about Plagiarism (Copy Checking)

- DO NOT COPY code from your friend, senior or internet!

- We will use copy checker program to detect plagiarism.
  We can ask you some explanation if your implementation
  has high similarity with any other implementation.

- Note that cheating is great violation
  according to POSTECH regulation!

- WE DON'T CARE WHO IS SOURCE AND WHO IS RECEIVER.

# Let's Practice! :)

- Click problem 1 in 'assn0' contest.

- It defines the goal of program, input/output style and time limit.

- You should satisfy all described statements.

- Luckily, we provide you a solution for this tutorial problem.

## A+B

### Description

Write a program that takes two integers $A$ and $B$ from the standard input (stdin) and print an integer $A + B$ to the standard output (stdout).

### Input Statement

- First line contains $T$ which indicates the number of test cases.
- Each following $T$ lines contains a test case consisting of two integers $A$ and $B$ $(-2^{31} \leq A, B < 2^{31})$.

### Output Statement

The program should print $A + B$ for each input. Each output should be separated by empty line.

### Input Example

```
4
1 2
3 4
5 6
7 8
```

Output Example

```
3
7
11
15
```

Time Limit: 1 second

- Copy the solution and paste it to your local file and save

- Then, submit the file to Domjudge system!

(Note that we used 'long long' type in C/C++ for this problem.
 Do not make a mistake using small data type that doesn't cover the given input range)

```c
#include <stdio.h>

int main() {
    int t;
    long long a, b;
    int i;
    scanf("%d", &t);
    for (i = 0; i < t; i++) {
        scanf("%lli%lli", &a, &b);
        printf("%lli\n", a + b);
    }
}
```
C

```cpp
#include <iostream>

using namespace std;

int main() {
    int t;
    cin >> t;
    for (int i = 0; i < t; i++)
    {
        long long a, b;
        cin >> a >> b;
        cout << a + b << endl;
    }
}
```
C++

```python
t = int(input())
for _ in range(t):
    a, b= map(int, input().split())
    print(a+b)
```
Python3

Clarification

- You will encounter numerous problems during the assignment.

- You can leave question to TAs at the domjudge system.

- You can ask any topic related to the programming assignments.

- But, do not ask us about any specific test case!

Clarification

- Click 'request clarification'

- Select the problem to ask and write your question.

- If your question is not for a specific problem,
  Choose 'General issue'.

- Answer must be written by hand in English.
  · Using tablet is also allowed.
  · You get 0 points for the problem
    if you write the answer in Korean.

- Please, submit your homework in pdf format with a single file.

- No late submission.