



East West University

A project report on

Online Judge

-Contest Programming Platform

Course Title: Software Engineering & Information System Design

Github: bit.ly/ewuoj

Course Code: CSE411

Section: 3

Submitted To:

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East West University

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Online Judge – Contest Programming Platform

build passing

Github: bit.ly/ewuoj

Introduction: Online judge is now very popular platform to measure the knowledge of the participants on a given problem. It's one kind of examination system by which they can prove their skills on coding. Without an automated judging system, sources codes have to judge with a manual compilation and checking with outputs. This process is very time consuming.

This Online Judge will help to make this process simpler. As it's a web-application so participants can attend contest from all over the world with live ranking. All the archive problems will help problems solvers for practicing. By the grace of internet and online judge now they can instantly understand their positions and if need they can also improve their coding skill.

Software description and facilities:

In such a contest platform there will be a set of problem given by admin, teachers or problem setters. For attending online judge everyone must have to register first. After registration they can easily login our website of online judge. There will be some major features like after login any participant can participate in live contest. The contest can be hosted as for all user or for some specific user. Archive problems feature will help programmers for practicing. There will be two types of rank list – one is live contest rank list and the other will be universal contest ranking.

Key of the project: For user interface HTML5, CSS, JavaScript and for backend it will be developed with java. Essential tools and dependencies–

- java-servlet
- junit4
- mysql-connector-j
- freemarker-ogsi
- jBCrypt
- Bootstrap (UI framework)

Documentation

Linux-Server:

- Download *Apache Tomcat 8* webserver or newer version from here- tomcat.apache.org.
- Make sure have installed JAVA, javac, gcc, g++, python. [*judgeserver used system compiler*]
- For easy installation/testing install *Eclipse Java EE IDE* eclipse.org.
- Download Git repository into *Apache Tomcat 8*.

```
$ git clone https://github.com/shaykhsiddique/Online-Judge-servlet-java.git
```

- If configure with *Eclipse* Make sure the server is working correctly.
- Change Database.java with database configuration.

```
src/main/me.shaykhsiddique/Database.java
```

- onlinejudge2019.sql contains the database schema, run it on mysql server.

```
Admin username: shaykhsiddique  
Admin password: 123456
```

- Maven build
- Maven install.

The web application is ready to go.....

For any Query: shaykhsiddique@gmail.com

Functional and Non-functional requirements

Non-Functional Requirement:

Responsive: The judge system will be handled with multiple threads which will makes the code compilation faster. User Interface of web application will perform responsive in any device.

Reliability & Privacy: All user details and the solution codes of all users will be protected and encrypted.

Security and privacy: For ensuring high quality of security we will use docker and deploy the application in a secure virtual environment and all the functions will in isolated container. This will make an extra layer of security with sandbox.

Functional Requirement:

There will be three types of users, admin – super user account, stuffs- teachers or problem setters can host a contest with this account and can set problems.

- Different level of user authentication.
- Live time contest hosting.
- Archive Problems.
- Online IDE.
- Smooth maintenance system and control panel.

Administration:

1. Can view/Edit any profile.
2. Can add/Delete/View Questions.
3. Can Approve a contest
4. Can approve user for a contest.
5. Can make Registration for Students and can delete them too.
6. Submit and Compile codes.

Problem Setters:

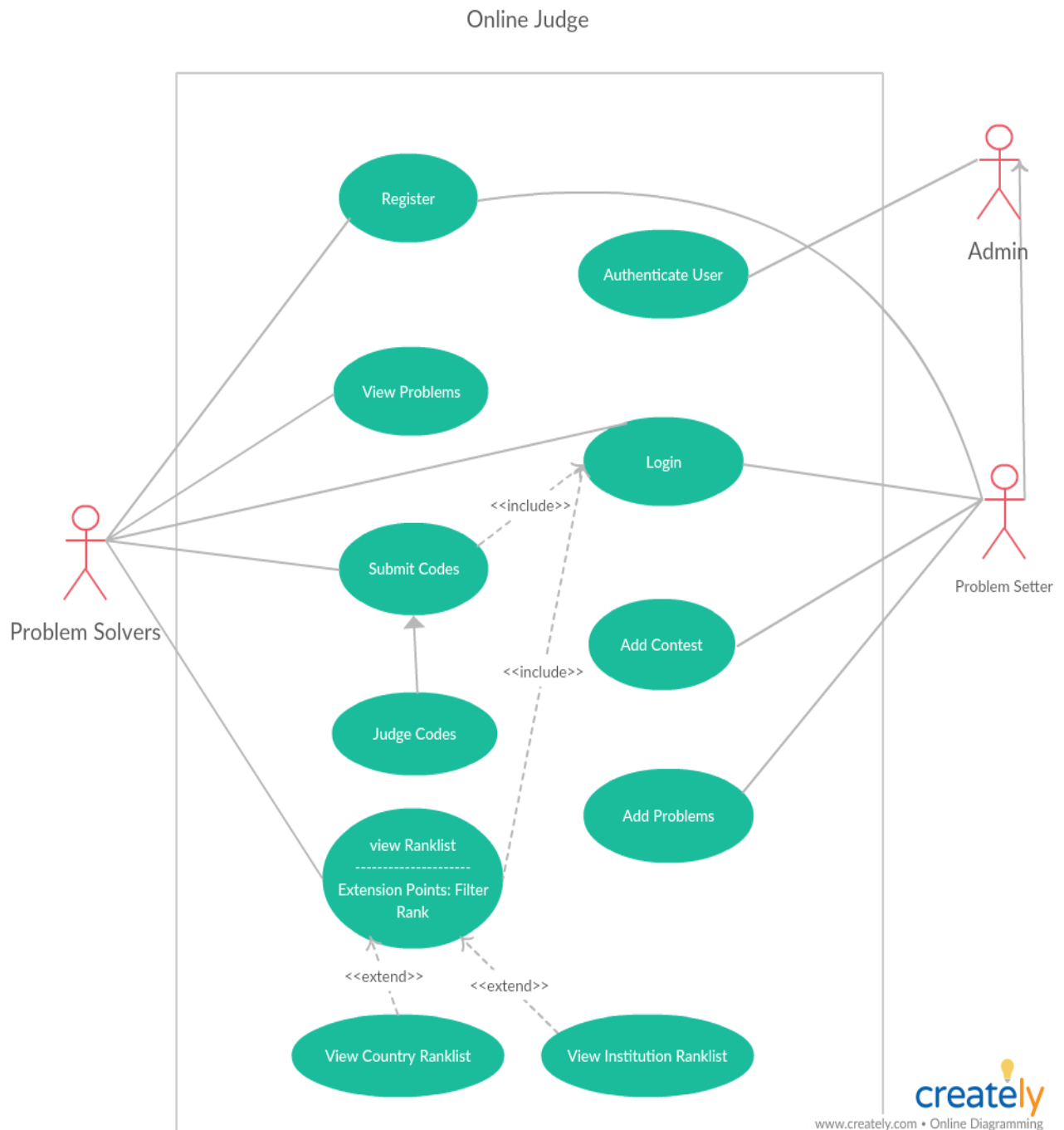
1. Can add/Delete/View Questions.
2. Can view any profile.
3. Can approve user for a contest.
4. Submit and Compile codes.

Problem Solvers:

1. Can Edit own profile Registration
2. Can view any profile.
3. Can view a valid problem.
4. Submit and Compile codes.

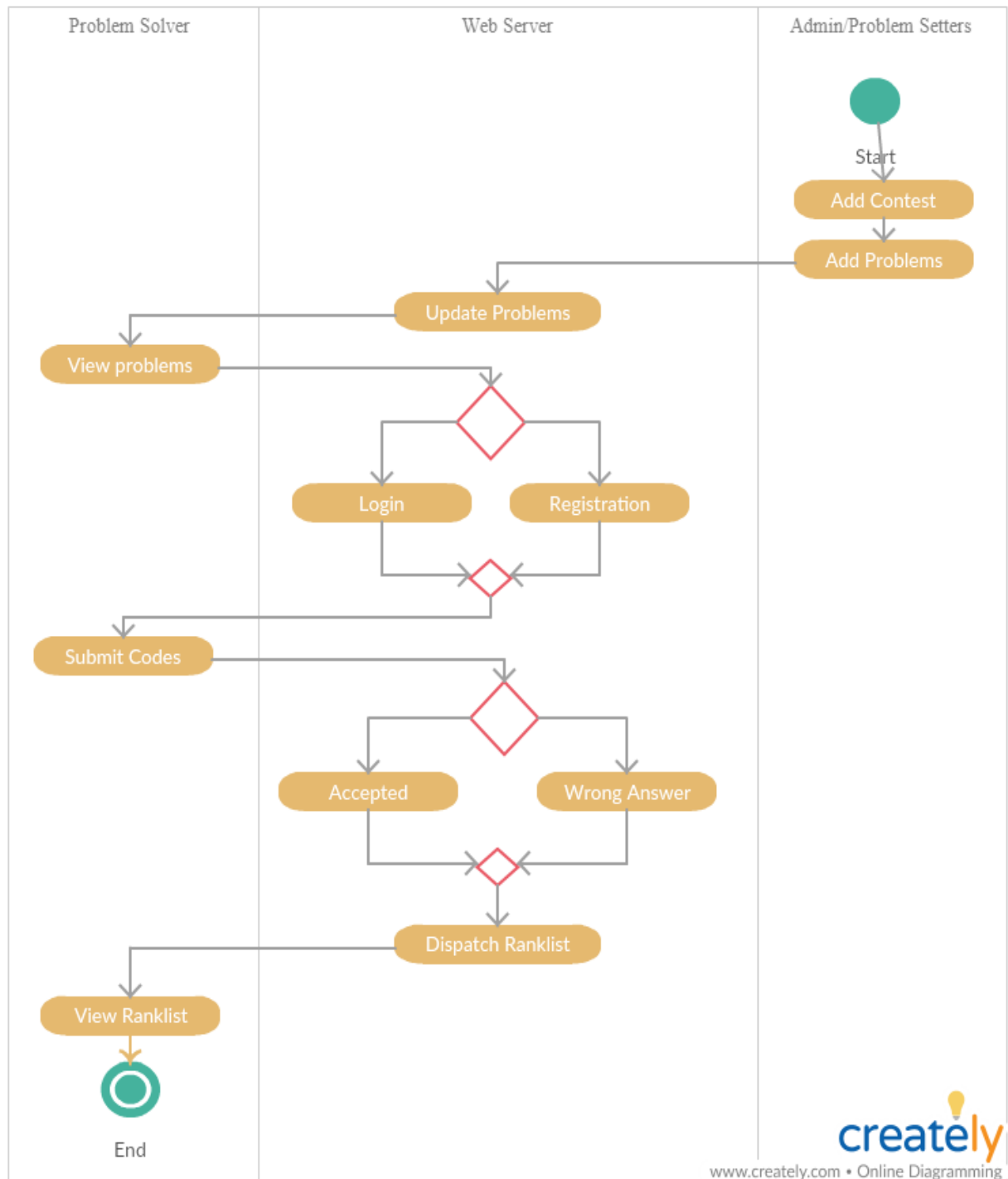
UML Diagram:

Use-Case Diagram: Use-case diagram will represent the functionality of this application with perspective to use of the application.



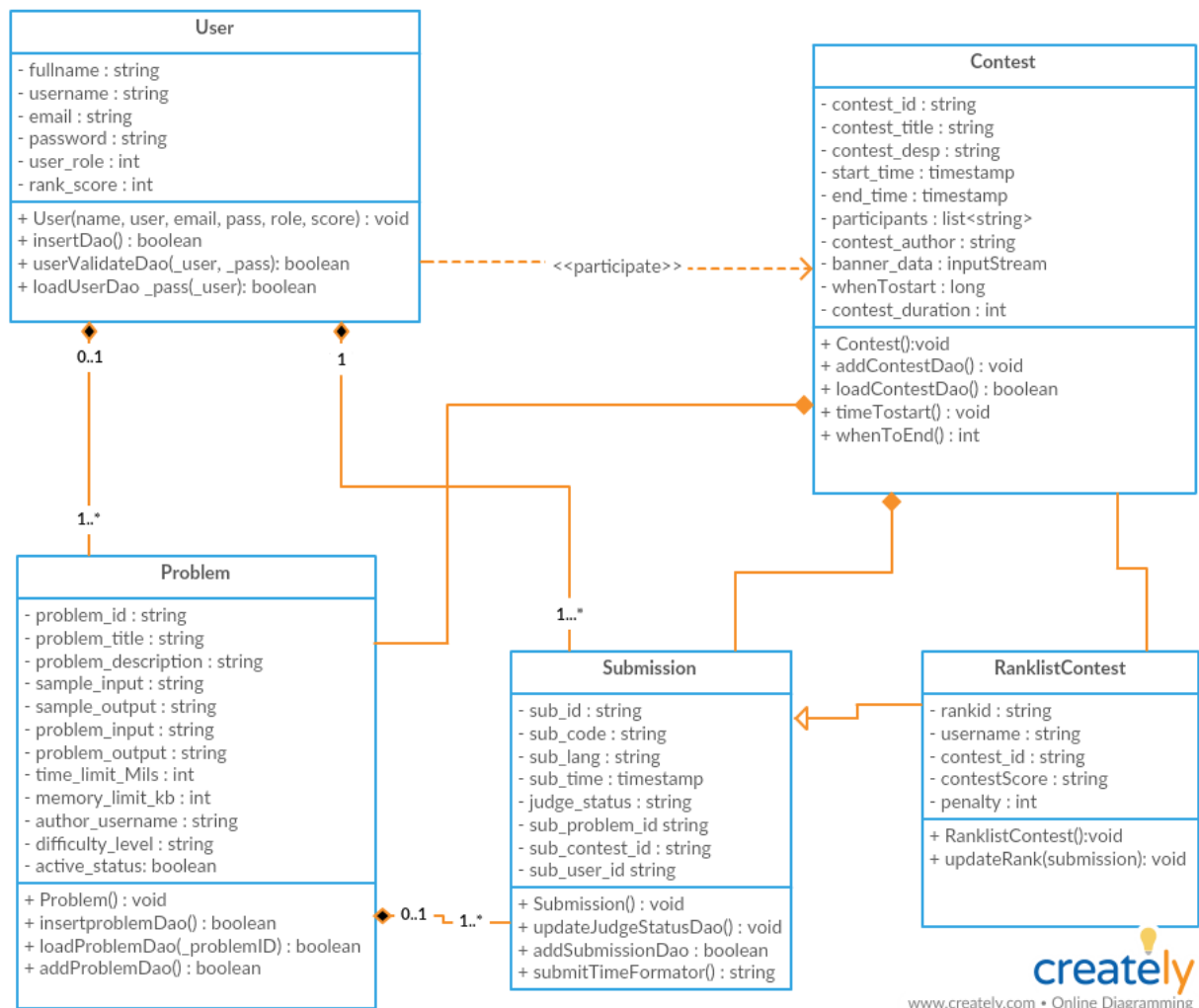
Use-Case diagram Online Judge

Activity Diagram: Represents the activity of online judge. Admin can add contest and problems, problem solver can solve that problem.



Activity diagram Online Judge

Class Diagram: Represents the data objects of the application. Here are major 5 user define data objects.



Class diagram Online Judge

Judge Server: We used server build in compiler for compilation purpose. The judge server will return judge status like In-Queue (IQ), Accepted (AC), Wrong Answer (WA), Time Limit Exceed (TLE) and Compilation Error (CE).

For Compilation, **submission** file must have read, write and execution permission.

Compiler works with Linux server system compiler. Supported languages are:

- C
- C++
- JAVA
- PYTHON

Maven Dependency:

- **servlet-spec**- javax.servlet:javax.servlet-api
- **junit4**- junit:junit
- **mysql-connector-j**- mysql:mysql-connector-java
- **freemarker-osgi**- org.freemarker:freemarker
- **jBCrypt**- org.mindrot:jbcrypt

Database class contains the mysql server location. Path of database class:

```
src/main/me.shaykhsiddique/Database.java
```

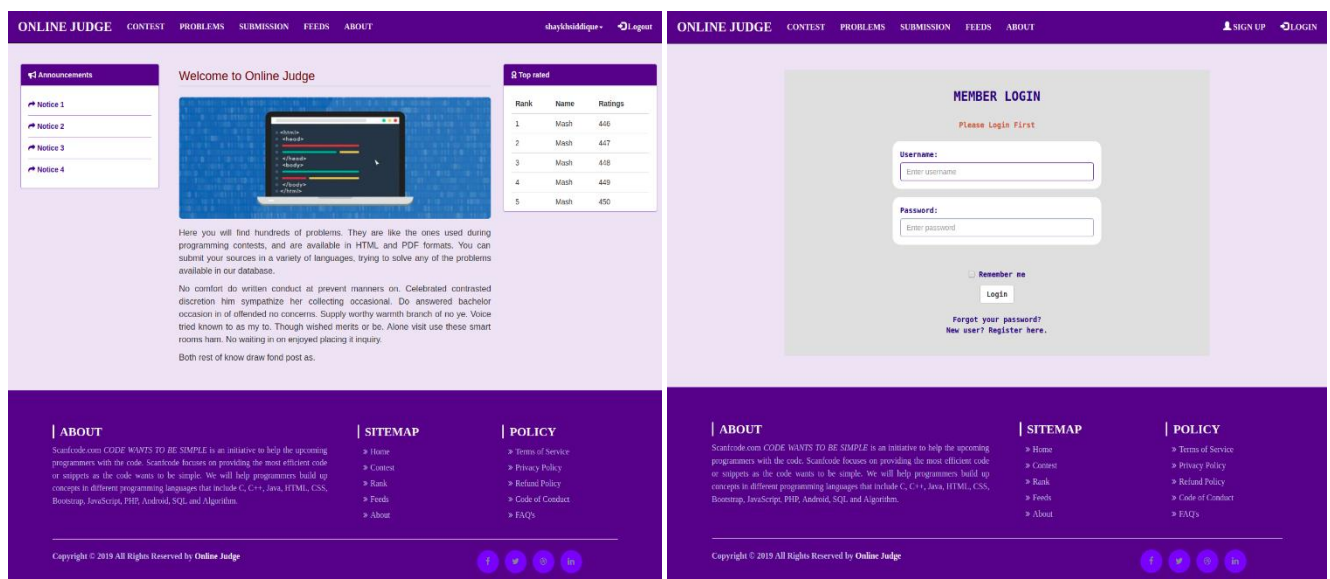
```
private String database_name = "onlinejudge2019"; //set database name
private String host = "jdbc:mysql://localhost:3306/"; //set host url
private String user = "root"; //set username for database
private String password = "*****"; //set password for database
```

Class JudgeServer.java will access read and write permission, for compiling and judging inputs and outputs. This process is started in

```
src/me.shaykhsiddique.JudgeServer/BackgroundJudge.java
```

Screenshots

Homepage and Login page:



Contest:

Contest

August Contest 2019 Long

Total Registered: 10

Starting Time: 03.00 PM - 04 Aug, 2019



Contest Starts In

00 16 06 49
Days Hrs Min Sec

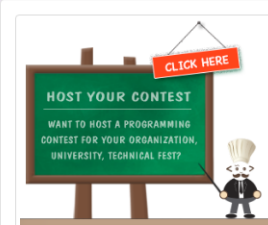
[Enter in Contest](#)

[Edit Contest](#)

Request for join

🕒 Upcoming Contest

Contest Name	Start Time	Duration	End Time
August Contest 2019 Long	03.00 PM 04 Aug, 2019	48 Hours	03.00 PM 06 Aug, 2019
August Contest 2019 Short	10.00 PM 05 Aug, 2019	3 Hours	01.00 AM 06 Aug, 2019



[Add New Contest](#)

🕒 Past Contest

Contest Name	Start Time	Duration	End Time
New Year Contest	01.00 PM 29 Jul, 2019	74 Hours	03.00 PM 01 Aug, 2019
Winter Contest 2018	10.00 PM 02 Dec, 2018	4 Hours	02.00 AM 03 Dec, 2018
Test Running Contest 1	10.27 PM 27 Jul, 2019	6 Hours	05.00 AM 28 Jul, 2019

| ABOUT

Scanfcode.com *CODE WANTS TO BE SIMPLE* is an initiative to help the upcoming programmers with the code. Scanfcode focuses on providing the most efficient code or snippets as the code wants to be simple. We will help programmers build up concepts in different programming languages that include C, C++, Java, HTML, CSS, Bootstrap, JavaScript, PHP, Android, SQL and Algorithm.

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Register and Problems:

ONLINE JUDGE

CONTEST

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Sign Up

Login

MEMBER REGISTRATION

Be a part of this platform.

Fullname:

Username:

Email:

Password:

Confirm Password:

Register

Already have an account? Login here.

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ONLINE JUDGE

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ABOUT

shaykhsiddique

Login

Problems

Show 10 entries

Search

#ID	Name	Difficulty	Submissions	Solved
1187A	Print Hello	Easy	52	35
1187B	Add numbers	Easy	52	35
1187C	The Sleeping Beauty	Hard	18	1
1187F	Expected Square	Easy	15	11
1187G	Gang Up	Easy	52	35
257D	Find a bug	Medium	52	35
3354A	Chess Master	Hard	17	7
3354B	Basketball Match	Easy	32	19
3354C	Flying Car	Medium	18	13
3477A	La la La	Easy	52	35

Showing 1 to 10 of 18 entries

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Last unsolved

Date/Time	Problem	Submission
08:55 PM 09/10/19	BITOBYT	43508188
08:55 PM 09/10/19	BITOBYT	43508188
08:55 PM 09/10/19	BITOBYT	43508188
08:55 PM 09/10/19	BITOBYT	43508188
08:55 PM 09/10/19	BITOBYT	43508188

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Problem Details and Submissions:

ONLINE JUDGE

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ABOUT

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Login

1010A - Byang Loves Byangette

Time Limit: 1.00 sec

Memory Limit: 64 KB

Support Languages: C, C++, JAVA, PYTHON

August Contest 2019 Long

Mysterious Sum

Kindergarten

Submit

Submit Solution

Submit Code

Byang Loves Byangette. Byangette Loves Byang.

They love each other so much, that they go around the town asking people questions about their love. In a person's life is answer correctly, they both the person with their tongue.

You happened to meet them at the street and they start asking you questions. If you don't know what to be covered with top of the solve, you better answer correctly.

They ask you one of the following questions:

1. Who loves Byang?

2. Who loves Byangette?

Input

Input will contain the question in a single line. There will be only one question.

Output

Print a single word, which is the correct answer.

Input:

Who loves Byang?

Who loves Byangette?

Output:

Byangette

Byang

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shaykhsiddique

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Submissions

Show 10 entries

Search

#ID	Problem	ProblemId	ContestId	Time	UserId	Result
OJ_347288cc	Print Hello	1187A	3443	04:25 PM 31 Jul 2019	shaykhsiddique	✓
OJ_3958b0ab	Print Hello	1187A	3443	04:25 PM 31 Jul 2019	shaykhsiddique	✗
OJ_73c79340	Print Hello	1187A	3443	04:24 PM 31 Jul 2019	shaykhsiddique	Compilation Error
OJ_4a8ba033	Print Hello	1187A	3443	06:23 AM 31 Jul 2019	shaykhsiddique	✓
OJ_7545081	Print Hello	1187A	3443	06:22 AM 31 Jul 2019	shaykhsiddique	✗
OJ_3d8d3375	Print Hello	1187A	3443	06:22 AM 31 Jul 2019	shaykhsiddique	Time Limit Exceed
OJ_74d771ee	Print Hello	1187A	3443	06:22 AM 31 Jul 2019	shaykhsiddique	Time Limit Exceed
OJ_7d88b943	Print Hello	1187A	3443	06:19 AM 31 Jul 2019	shaykhsiddique	✗
OJ_5758048b	Print Hello	1187A	3443	06:19 AM 31 Jul 2019	shaykhsiddique	✓
OJ_992d708e	Print Hello	1187A	3443	06:15 AM 31 Jul 2019	shaykhsiddique	Compilation Error

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Future extensions: We have a plan to extend this software with some external features like Tutorial, Clarification of problem, and notification system in the update version.

More: shaykhsiddique.me
For Query: shaykhsiddique@gmail.com