

**ONLINE JUDGE FOR UNIVERSITY**  
**A PROJECT REPORT**

*Submitted by*

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*Under the guidance of: Prof. Shishir Kumar*



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*Submitted in the partial fulfilment for the award of the degree*

*of*

**BACHELOR OF TECHNOLOGY**

**IN**

Computer Science and Engineering

**Department of Computer Science & Engineering**  
**JAYPEE UNIVERSITY OF ENGINEERING AND TECHNOLOGY,**  
**AB ROAD, RAGHOGARH, DT. GUNA – 473226 MP, INDIA**



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### **DECLARATION BY THE STUDENT**

We hereby declare that the work reported in the B. Tech. project entitled as "**ONLINE JUDGE FOR UNIVERSITY**", in partial fulfillment for the award of degree of Bachelor of Technology submitted at Jaypee University of Engineering and Technology, Guna as per the best of our knowledge and belief that there is no infringement of intellectual property right and copyright. In case of any violation we will solely be responsible.

A handwritten signature in black ink, slanted to the left, reading "Shrey Kaushal".

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Date: 6<sup>th</sup> May 2018



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### CERTIFICATE

This is to certify that the work titled "**Online Judge for University**" submitted by "**Shrey Kaushal, Shubham Jain and Shubham Shukla**" in partial fulfillment for the award of degree of **B. Tech** of Jaypee University of Engineering & Technology, Guna has been carried out under my supervision. As per best of my knowledge and belief there is no infringement of intellectual property right and copyright. Also, this work has not been submitted partially or wholly to any other University or Institute for the award of this or any other degree or diploma. In case of any violation concern student will solely be responsible.

A handwritten signature in blue ink, which appears to read "Shishir Kumar" followed by the date "18/5/18".

**Prof. Shishir Kumar**

Dean (A&R) & HOD CSE

Date : 6<sup>th</sup> May 2018

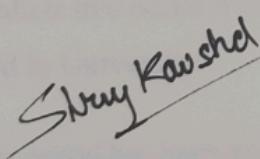
## ACKNOWLEDGEMENT

We have put our sincere efforts in this project. However, it would not have been possible without the kind support and help of many individuals and organizations. We would like to extend our sincere thanks to all of them.

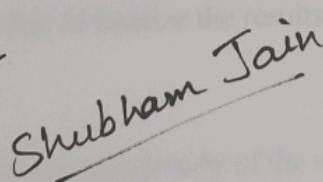
It is our privilege to express our sincerest regards to Dean Academics & Research **Prof. Shishir Kumar**, for his valuable inputs, able-guidance, encouragement, whole-hearted cooperation and constructive criticism throughout the duration of our project.

We deeply express our sincere thanks to **Prof. Shishir Kumar** for encouraging and allowing us to present the project on the topic "**Online Judge for University**" at our department premises for the partial fulfillment of the requirement leading to the award of B. Tech degree.

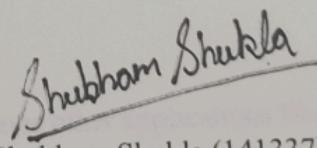
We would also like to express our gratitude for kind co-operation and encouragement of our faculties and colleagues who helped us in the completion of this project.



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Date : 6<sup>th</sup> May 2018

## EXECUTIVE SUMMARY

The **Online Judge** is a Web based application that is primarily focused to be used to act as an automated judge in the various programming contest to be held in the University. It will evaluate the source codes submitted by contestants and judge them according to various parameters.

The system can compile and execute code and test them with pre-constructed data in a sandboxed environment. Submitted code may be run with restrictions, including time limit, memory limit, security restriction and so on. The output of the code will be captured by the system and compared with the submitted standard output. The system will then return the result.

Online Judge has rank lists showing users with the biggest number of accepted solutions and shortest execution time for a particular problem. It is a fully automated system to run programming contests in the University, like KodeAthon, Code Sprint etc. It has a focus on usability and security and can be used in many live contests that will be held in the University.

There are various modules integrated in the application to judge the participants and is most likely to return many verdicts like Compile Error, Runtime Error, Time limit exceeded, Memory limit exceeded and so on. So, on the basis of these verdicts this portal will be able to finalize the results of the various contests to be held in University.

This portal has been made after careful study of the various other applications like Dom-Judge, Uva and pc2. In addition, we have studied and adopted many features which are implemented in other applications.

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Acronym	Full Form	Page No.
OJ	Online Judge	1
SDLC	Software Development Life Cycle	12
SPOJ	Sphere Online Judge	5
MVC	Model View Control	9
HTML	Hyper Text Markup Language	9
CSS	Cascading Style Sheet	19
MOSS	Measure of Software Similarity	20
AST	Abstract Syntax Tree	21
SQL	Structured Query Language	22
DFD	Data Flow Diagram	15

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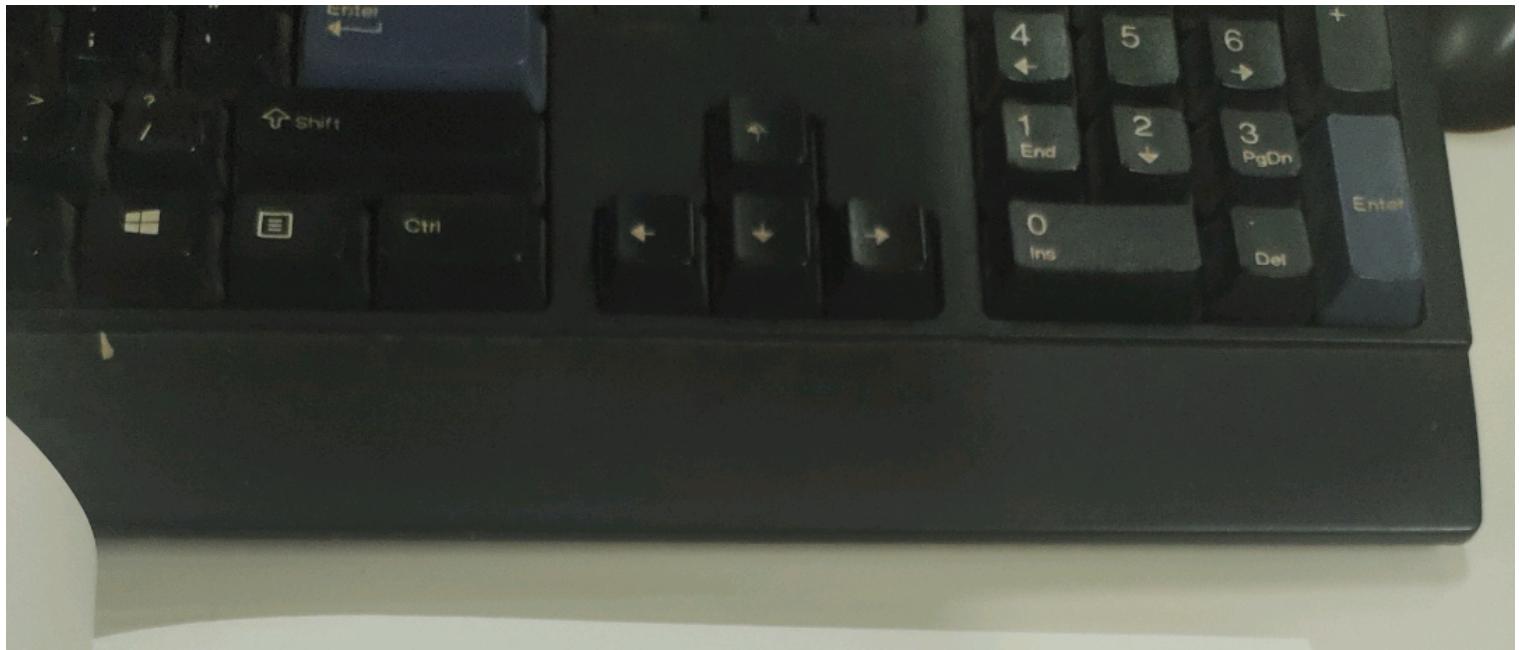
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## CHAPTER 1

### INTRODUCTION

**Online Judge** is web-based application that is used to test source codes in programming contests. They are also used to practice topics such as Data Structures and Algorithms. Since this system is being custom made for the university all the requirements are taken from the faculty members and the technical staff. There are various modules integrated in the application to judge the participants and is most likely to return many verdicts like Compile Error, Runtime Error, Time limit exceeded, Memory limit exceeded and so on. So, on the basis of these verdicts this portal will be able to finalize the results of the various contests to be held in University.

#### 1.1 Aim

To create an Online Judge for the University to organize coding contests for increasing the coding culture among the students. Learners can effectively improve their programming skills from participating in a large number of contests and programming training which will thus increase their chance of getting placed in reputed product based companies.

#### 1.2 Motivation

The motivation for this project comes from the lack of the programming environment in the University so as to create a culture among students. As soon as this platform is deployed the Nov 25, 2022, public Programming among students might increase. This Portal has to be made sure that it works securely on the college servers and can be optimized contests will be held in University

## CHAPTER 7

### CONCLUSION

The aim of this project was to develop an Online Judge Portal for the University which can conduct various coding competitions among a large number of students at a time online and where students can enhance their technical skills.

#### 7.1 Conclusion

Finally, we would like to conclude that in the given time period while we working on this project we learnt many new technologies, concepts and have also learnt about working in a team. Our project Online Judge for University is based on Django and many other platforms specified earlier. This insulates the application from technical implementation and enhancement to support future technologies in a transparent manner without having the major impact on the application. This also enables the easy portability of application to other operating system and databases. This project followed the following SDL, which involved the steps of :

- Requirement analysis
- Design
- Coding
- Testing
- Implementation
- Maintenance

Thus, we were able to understand in greater details the various software engineering processes and were able to apply them to our project. The features of this project are:

#### For Students:

- Login
- User Registration
- Problem Sets
- Submissions
- Ranking on Scoreboard

**For Admin:**

- Create Contests
- Manage Scoreboard
- Approve Problems
- Manage Users
- Manage Contests
- Manage Submissions

**For Problem Setter:**

- Create Regular Contests
- Upload Problems
- Manage Problem Sets
- Provide Test Cases
- Manage User Queries
- Manage Hints
- Manage Penalties
- Manage Submissions

## 7.2 Scope of Future Enhancement

The portal can be further enhanced as a Judging Portal for the University for placement activities, that can act as an additional achievement for Students and companies to sort students based on their skills. The Online Judge can further include automatic grading, webinar facilities and others.

- Can be modified and upgraded to be used as an auto grader.
- Can support more languages of source code
- Can have video tutorials and editorials for active learning.
- Can be used to check plagiarism in tutorials or assignments.

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