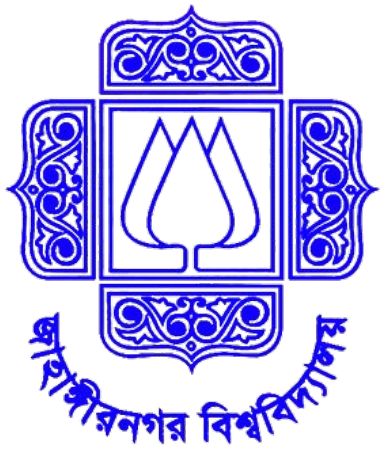

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Easy C: A new method of learning C programming in the context of Bangladesh

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Outline:

- Overview
- Related Works
- Research Questions
- Objectives
- Project Diagrams
- Algorithm for Challenge Judgement
- Results
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Overview:

- Disciplined lesson categories with required lessons.
- Category wise challenges to judge the learnt lessons.
- Ranklist to check the current position among other learners.
- Dashboard to judge the progress of learning.
- Online community with instant chatting service.
- Online C compiler with extensible syntax editor.
- Opportunity to view other learners progress.
- Ability to track own submissions.

Related Works

Online Tutorial Sites:

- No opportunity to test the learnt knowledge.
- No practice either.
- Example: Tutorialspoint, w3schools etc.

Related Works(cont'd)

Online Judges:

- No opportunity to learn the lessons.
- No fixed courseware.
- Example: Uva online judge, codeforces, codechef

Research Questions:

- How to provide online self maintained code execution environment with Sandbox support?
- How to combine challenges and lessons to create a disciplined courseware?
- How to keep track of learners progress?
- How the learners can interact with each other?

Objectives:

- **Easy C** provides detailed tutorials on C programming language in 16 predefined categories and problems related to the learnt knowledge.
- Using this application the learners can write code, execute and get verdict of the code online using any device having a web browser.
- **Easy C** keeps track of each user's progress and give a system which can meet the teachers demand of C programming language course.
- It has both web application and Android mobile application version.

Project Diagrams

Project Diagrams:

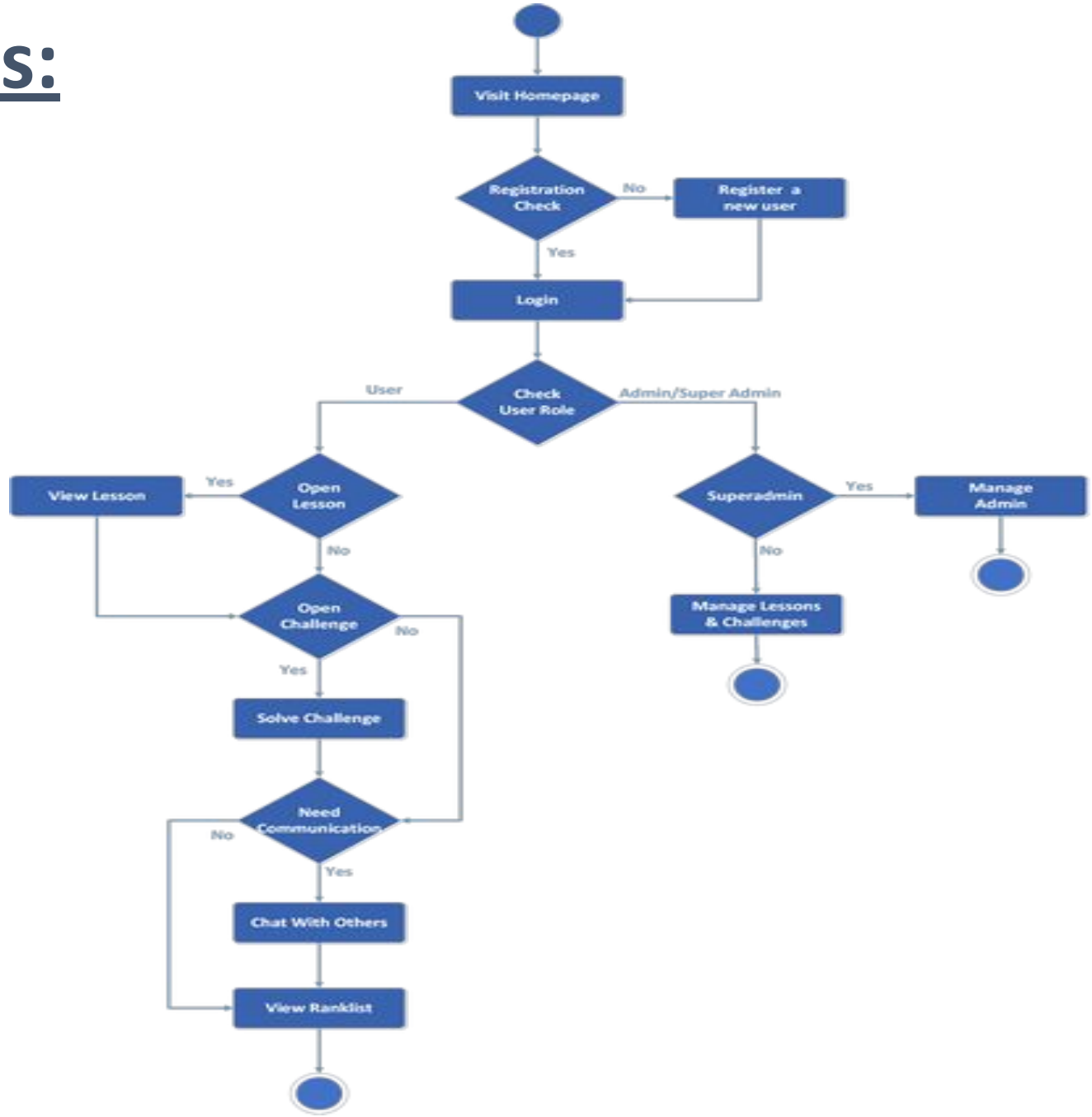


Figure :Activity Diagram

Project Diagrams(cont'd):

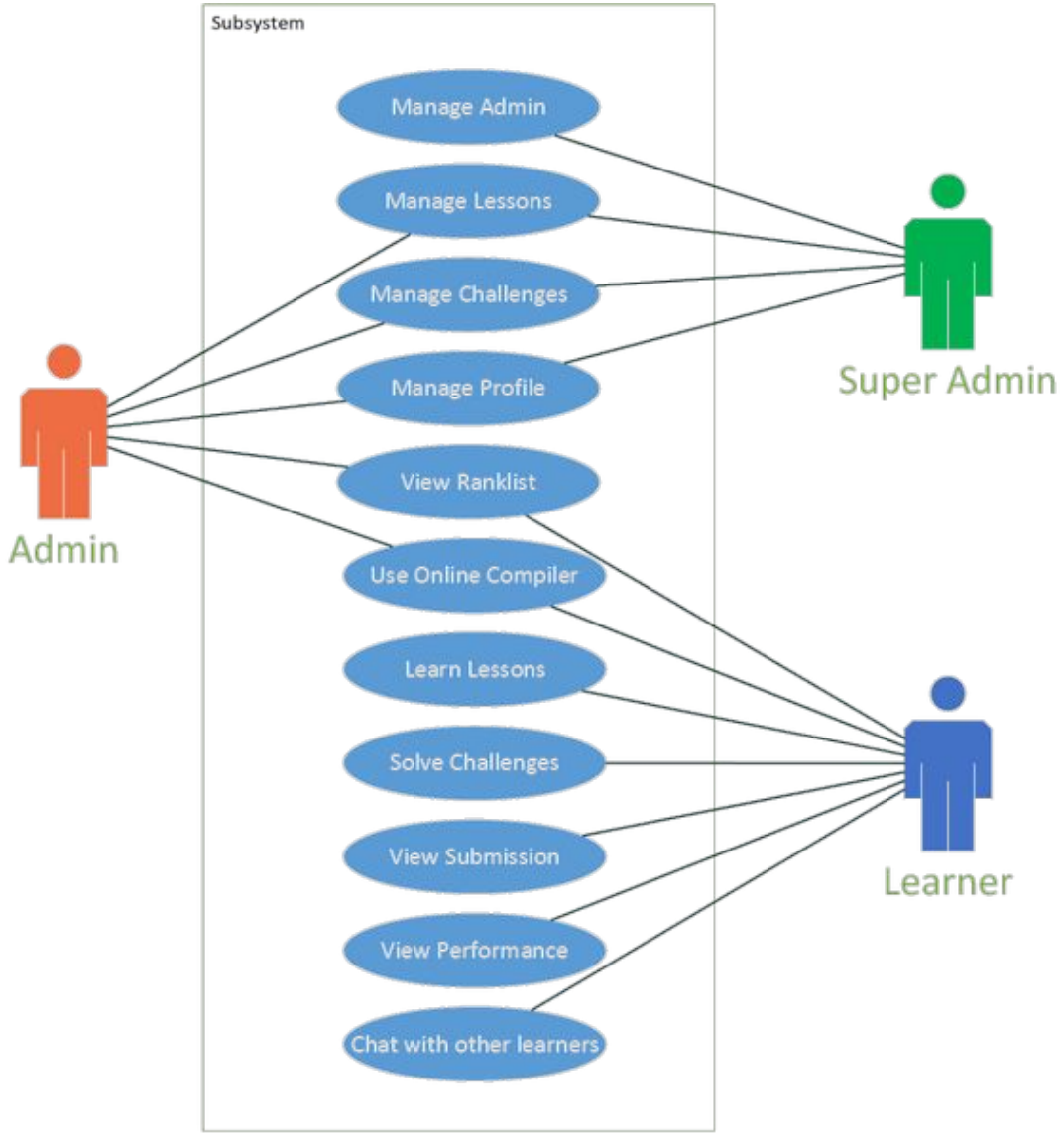


Figure: Use-case Diagram

Project Diagrams(cont'd):

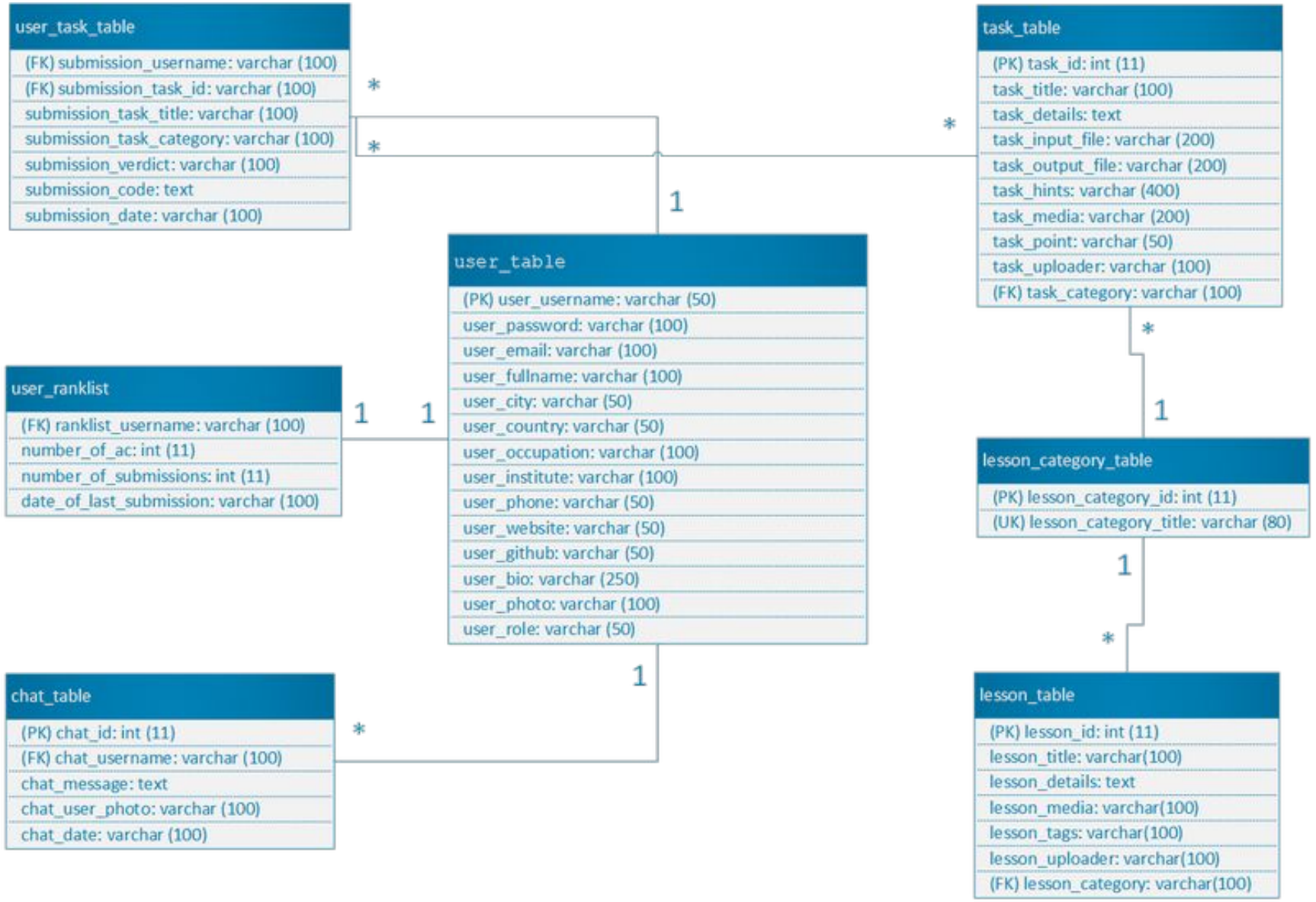


Figure: Entity Relationship Diagram

Project Diagrams(cont'd):

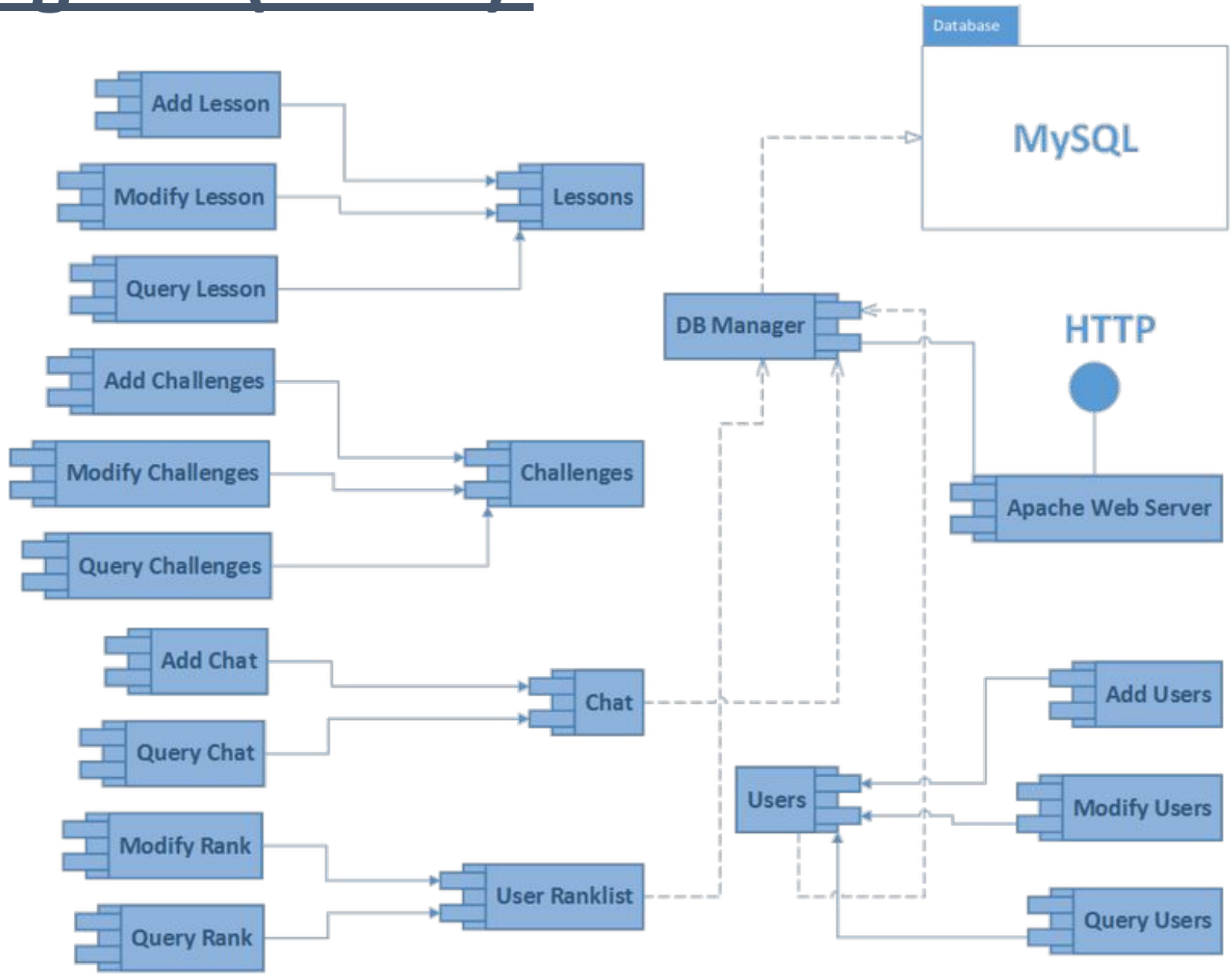


Figure: Component Diagram

Algorithm for challenge judgement:

```
function challenge_judgement (string user_code):
    if user_code is compiled successfully
        then run user_code
        if the execution time exceeds time limit
            then return verdict Time Limit Error
        else if does not exceed time limit
            then store the output after running user_code
            if the output matches with judge output
                then return verdict Accepted
            else if does not match
                then return verdict Wrong Answer
            end if
        end if
    else if user_code does not compile successfully
        then return verdict Compilation Error
    end if
end function
```

Results

Results: Online Compiler

- **Easy C** provides full independent online compiler with Sandbox.

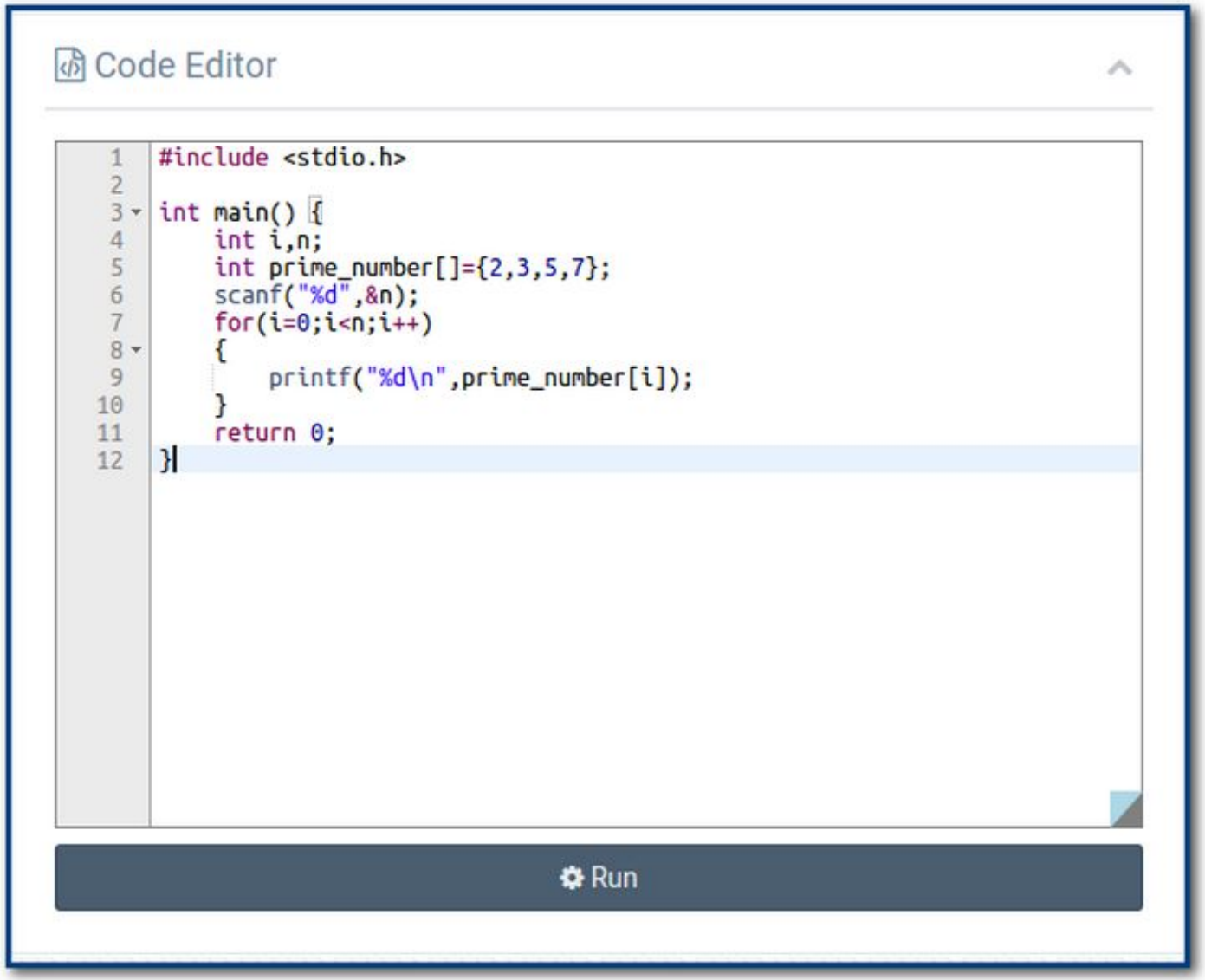


Figure : Online Compiler

Results(cont'd): Instant Chatting

- Instant chatting enables to grow a community of learners.

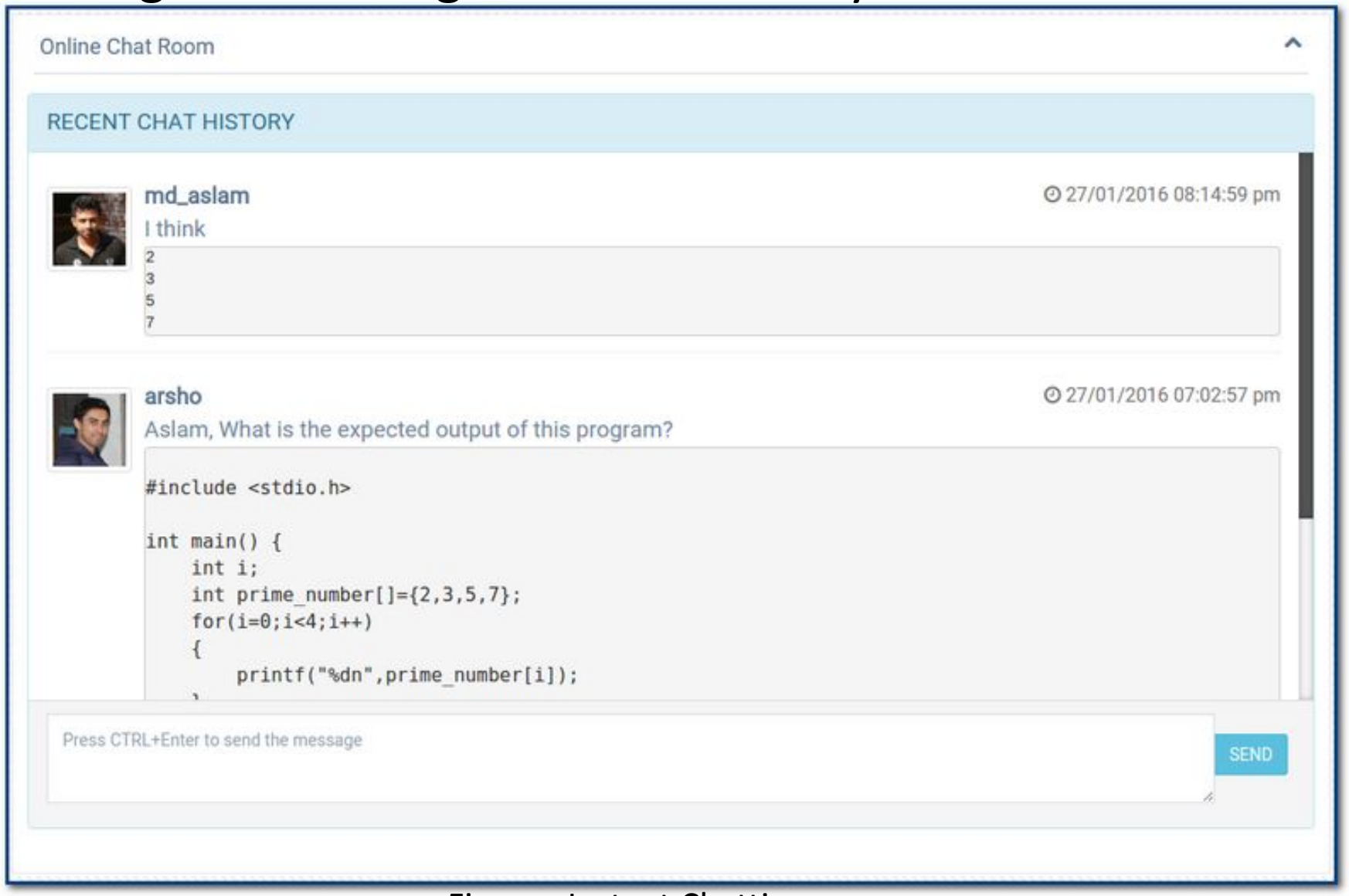


Figure : Instant Chatting

Results(cont'd): Lessons

- Lesson of each category has singleton view.

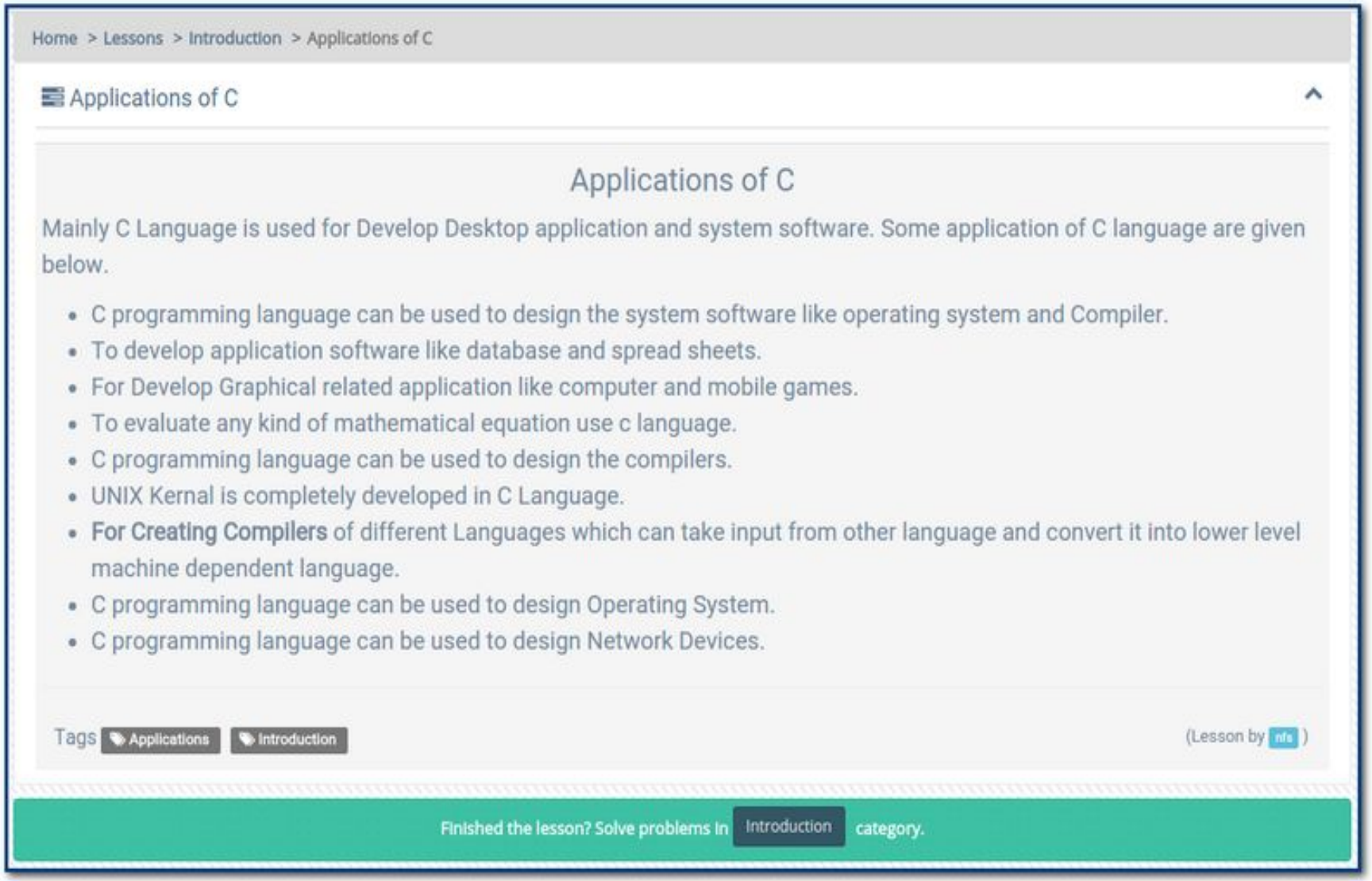


Figure : Applicatino of C in Introduction Category

Results(cont'd): Challenges

- Each category has corresponding challenges to ensure learners progress.

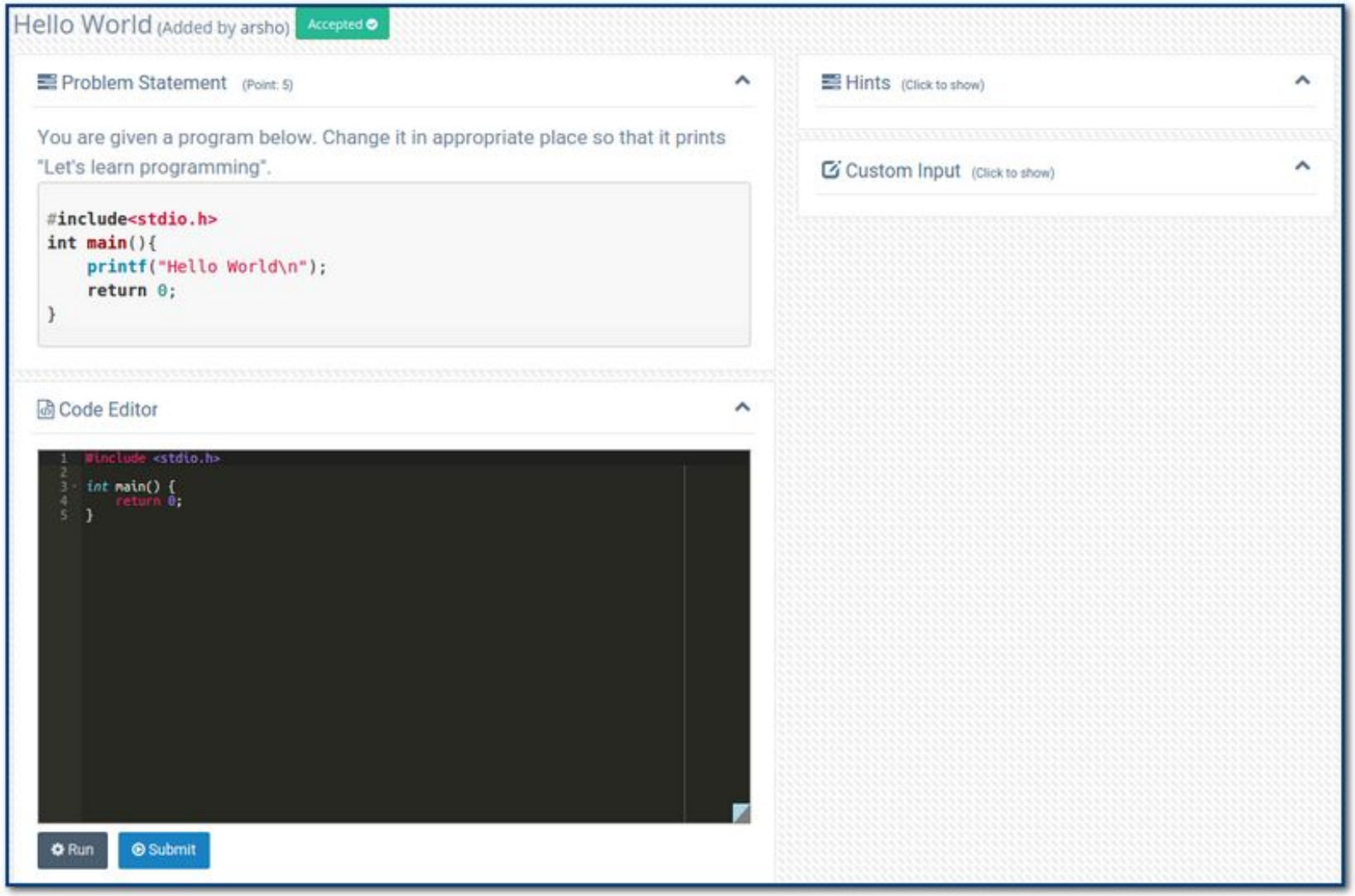


Figure : Hello World Challenge in Introduction Category

Results(cont'd): Ranklist

- Learners are ranked according to the number of solved challenges.

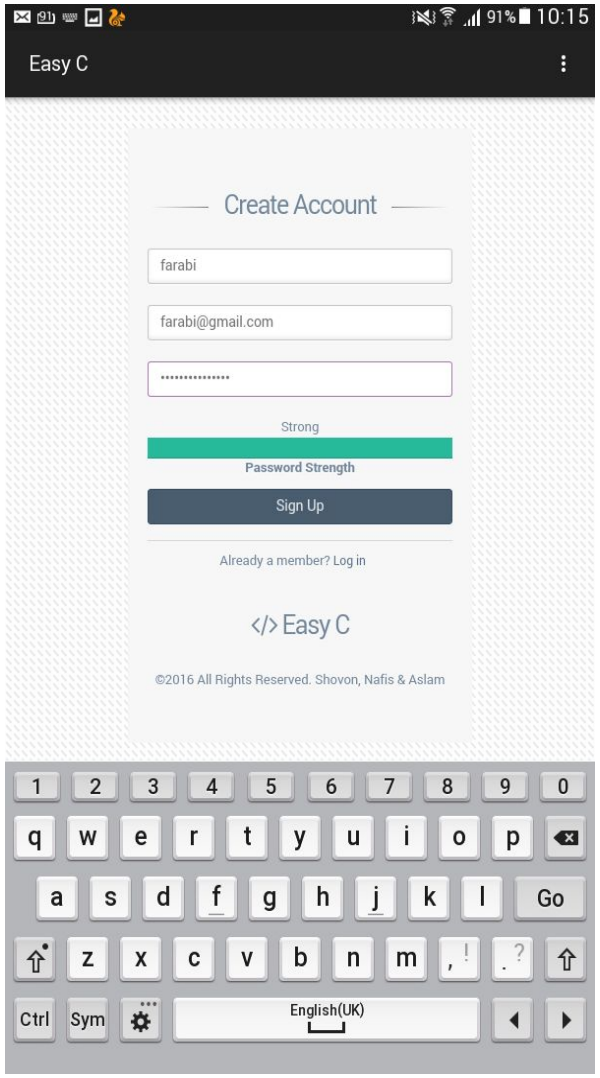
Ranklist

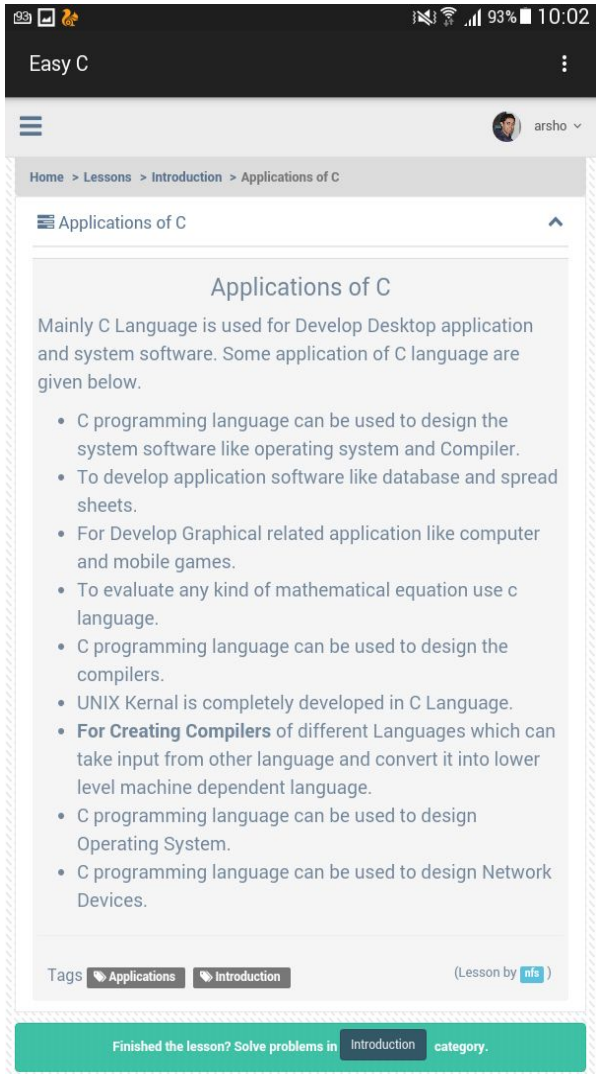
Rank	Photo	Username	Fullname	Country	Total Solved
1		arsho	Ahmedur Rahman Shovon		2
2		mahbub	Mahbub Alam		1
2		nfs	Md. Nafis Sadique		1
2		risala	Risala Tasin Khan		1
2		saimun	Mathew J. Saimun		1
3		irfan	Irfan Hasib		0
3		md_aslam	Md. Aslam Hossin		0

Figure : Ranklist

Results(cont'd): Mobile Application

- Easy C:Provides Mobile application for the user





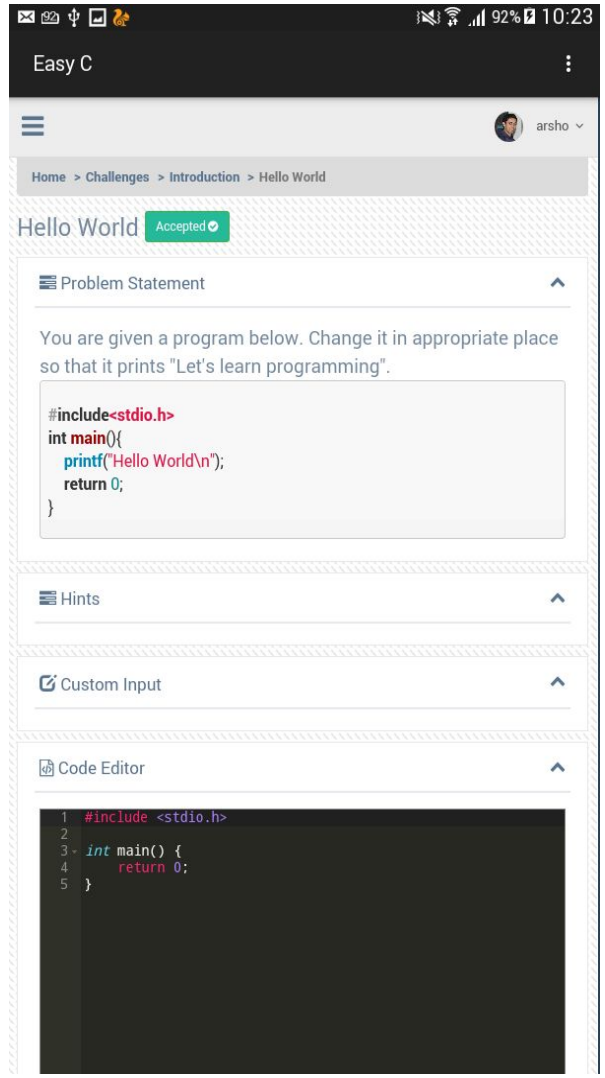


Figure : Easy C Mobile Application Demonstration

Conclusion:

- Lesson-Challenge paired disciplined courseware for C programming language.
- New way of interactive programming.
- Full independent online compiler with Sandbox.

Future work:

- Extending the platform for other programming languages like C++, Java, Python etc.
- Adding video tutorials.
- Arranging online contest.
- Increasing server capacity.
- Deploying “**Easy C**” in cloud server.

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Prototype presentation