

Just Mark It

User's Guide



Cristian Dinu

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1 Introduction

Just Mark It is a tool for automated marking of software assignments developed by Cristian Dinu for his final year project at the University of Huddersfield. This manual was created to aid users of the product, namely administrators, professors, and students. It provides explanations on how the application can be used and does not go into the technical details of the tool.

This user manual is structured as follows. Section 1 provides a basic introduction to the tool. Section 2 presents general application features available to all users. Then, the application interface and the actions that can be done from the interface by administrators, professors, and students are discussed in Section 3, Section 4, and Section 5, respectively. Finally, Section 6 concludes this user manual.

The features of this product are briefly described in Section 1.1, while future work is summarized in Section 1.2. For more technical details and the rationale behind **Just Mark It**, consider reading the report and presentation slides as well as watching the video presentation created by the author.

1.1 Features

- Three types of user (administrator, professor, student) ✓
- Login/Logout for each type of user ✓
- Add/edit/delete assignment and tests (professor side) ✓
- Submit code and run tests for an assignment (student side) ✓
- Compile, run and test submitted code ✓
- Email notifications ✓
- Coding style assessment ✓
- Application accessible from the Internet (<https://justmarkit.uk/>) ✓
- Administrator worker (automatically marks code and releases grades on behalf of professor) ✓
- Detailed reports for students and professor ✓
- Input validation (JavaScript, PHP) ✓
- Automatically redirect to page after login ✓
- Download test output for student ✓
- Bulk enrolment ✓
- Filter by user role and status for administrator ✓
- University-inspired colour theme ✓

1.2 Future Work

- Support for other programming languages (e.g. C/C++, C#, Python)
- New types of tests
- Different code structure (multiple source code files)
- Integration with other tools (e.g. Git, Moodle, Brightspace)
- Plagiarism detection
- More configuration options
- More metrics
- Smart assessment (using AI)

2 User

2.1 Messages

The web application validates all user inputs to enforce correctness and consistency of the application data. Validation is done on both client and server side. Validation on the client side is done using features provided by HTML5 in combination with JavaScript (JS) code. Validation on the server side is done in PHP. The outcome of the validation (both for client and server side) is displayed to the user. In addition to that, the application provides informational messages to the user in response to every request they make.

2.1.1 Confirmation Message

When the user-provided inputs are correct, the application continues to process the data received from the user. If everything goes well, a confirmation message is displayed in green to inform the user that the requested operation was performed successfully. For example, Figure 1 shows a success message.

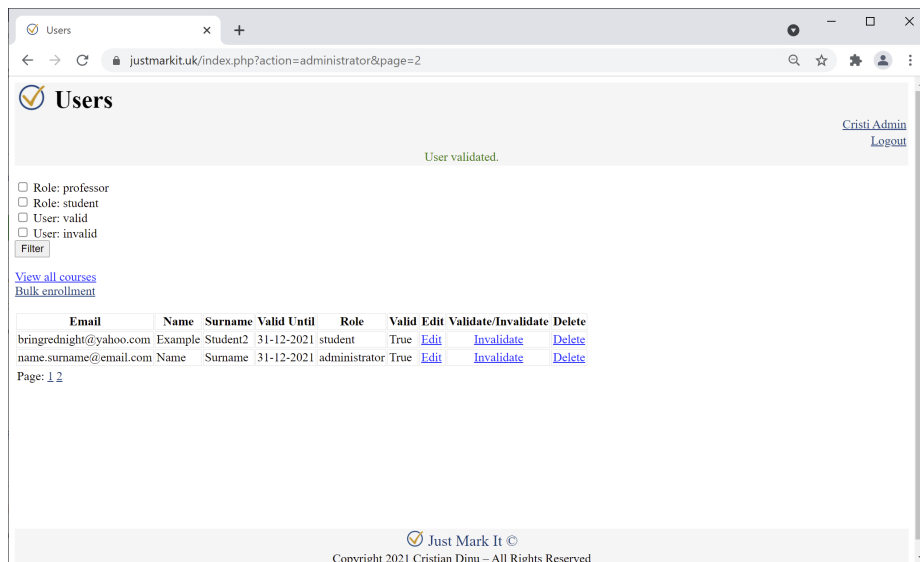


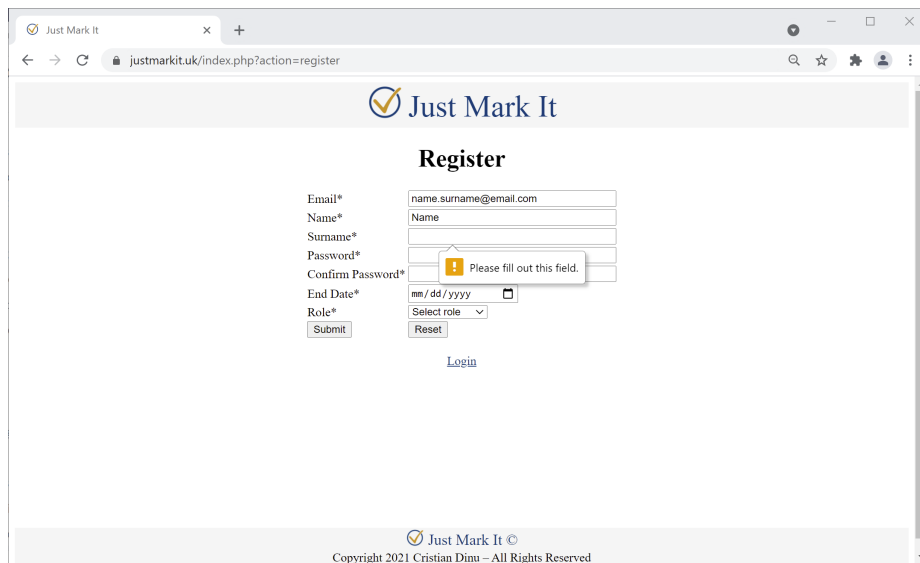
Figure 1: User: Confirmation Message.

2.1.2 Error Message

When an input validation error is detected in HTML5, the corresponding field is emphasized, and the error message is displayed next to it. For example, Figure 2 shows a validation error generated by the HTML5 code.

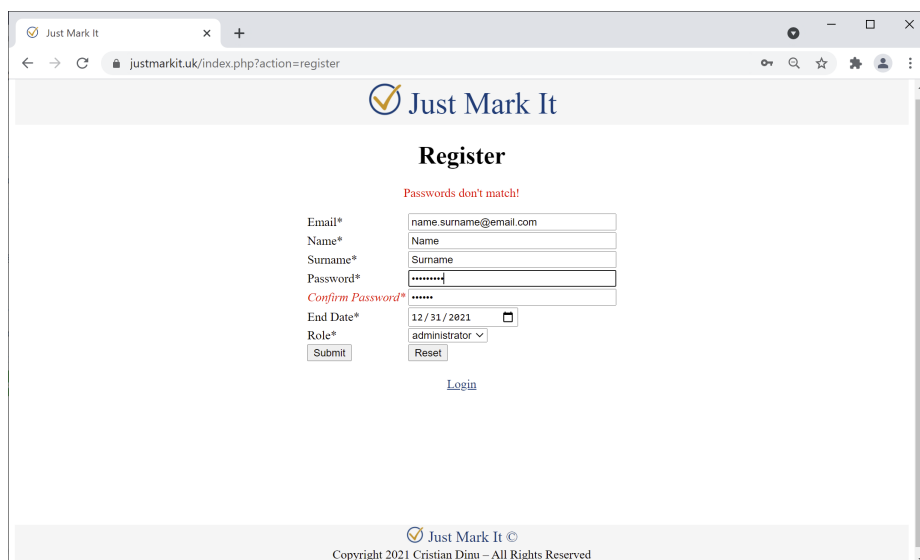
When the input values pass the HTML5 validation, they are validated in JavaScript and PHP. An example of a validation error originating from the JavaScript code is shown in Figure 3. Similarly, an error from the PHP code is presented in Figure 4.

In some rare cases when the server processing fails for other reasons than incorrect inputs, an error message is displayed in red, similarly to the input validation error message in Figure 4. The



The screenshot shows a web browser window with the URL `justmarkituk/index.php?action=register`. The page features the "Just Mark It" logo and a "Register" heading. The registration form includes fields for Email*, Name*, Surname*, Password*, Confirm Password*, End Date*, and Role*. A tooltip with an exclamation mark icon and the text "Please fill out this field." is displayed over the Password* field. Below the form is a "Submit" button and a "Login" link. The footer contains the "Just Mark It" logo and the text "Copyright 2021 Cristian Dinu - All Rights Reserved".

Figure 2: User: HTML5 Error Message.



The screenshot shows the same registration page as Figure 2, but with a JavaScript error message displayed in red text above the Password* field: "Passwords don't match!". The form fields are filled with the same data as in Figure 2: Email* is "name.surname@email.com", Name* is "Name", Surname* is "Surname", Password* is "*****", Confirm Password* is "*****", End Date* is "12 / 31 / 2021", and Role* is "administrator". The "Submit" button and "Login" link are still present. The footer remains the same.

Figure 3: User: JavaScript Error Message.

purpose of the message is to inform the user on the error encountered and provide information on what is required for the requested operation to be completed successfully.

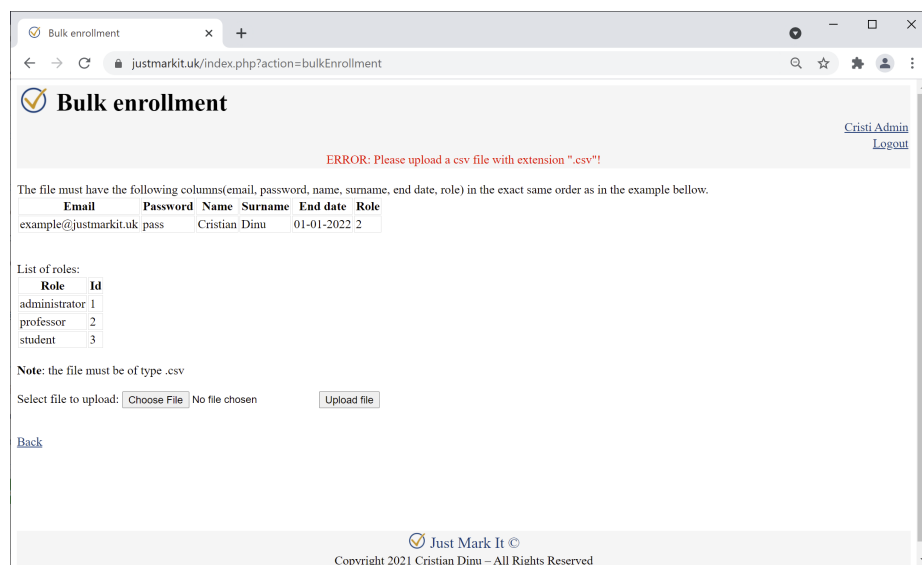


Figure 4: User: PHP Error Message.

2.2 Emails

The application sends emails to registered user to inform them about important events. In addition to that, administrators receive emails about the status of the marking server and the error or exception that caused a problem when applicable. An example of an email message is shown in Figure 5.

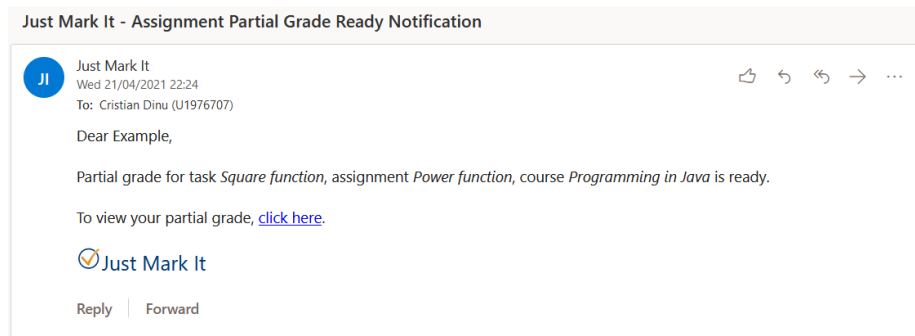


Figure 5: User: Email Message.

2.3 Forms

The user interacts with the application through forms. A form consists of one or more labels and the corresponding input fields; a label is used to describe what the input field should contain. A form collects user inputs and sends them to the server for processing. When a form input is mandatory, the label that describes that input is followed by the asterisk (“*”) symbol to indicate this requirement.

2.4 Register

To register a user account go to <https://justmarkit.uk/index.php?action=register> or click on the *Register* link from the main page. The registration page is depicted in Figure 6. Insert the following information:

Email* A valid email address of the user

Name* Name of the user

Surname* Surname of the user

Password* Password; choose a strong password for this account

Confirm Password* Confirm the password

End Date* Date until when the account is valid

Role* Role of the user

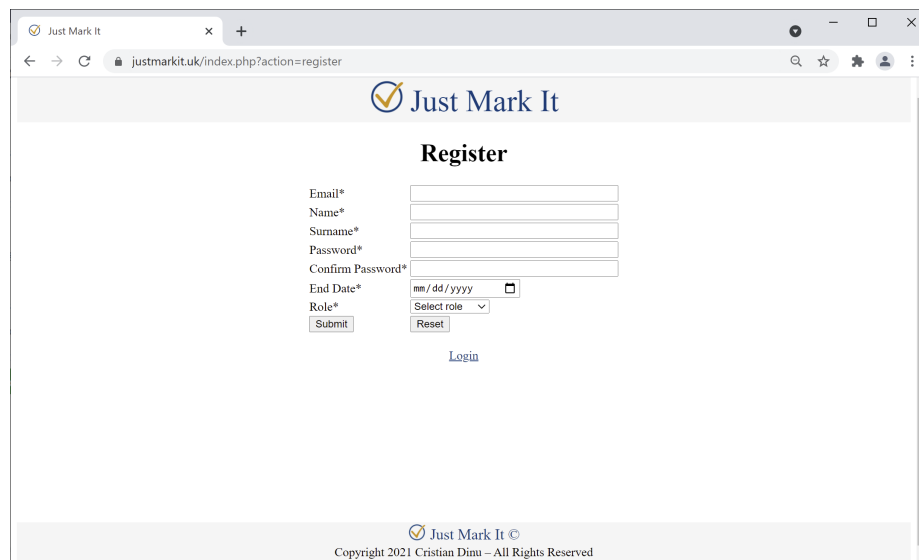
A screenshot of a web browser displaying the 'Just Mark It' registration page. The browser's address bar shows 'justmarkit.uk/index.php?action=register'. The page has a light gray header with the 'Just Mark It' logo. Below the header, the word 'Register' is centered. The form contains several input fields: 'Email*', 'Name*', 'Surname*', 'Password*', and 'Confirm Password*', each with a corresponding asterisk indicating it is required. There is also an 'End Date*' field with a date picker set to 'mm/dd/yyyy'. A 'Role*' dropdown menu is labeled 'Select role'. At the bottom of the form are 'Submit' and 'Reset' buttons. A 'Login' link is positioned below the 'Reset' button. The footer of the page includes the 'Just Mark It' logo and the text 'Copyright 2021 Cristian Dinu - All Rights Reserved'.

Figure 6: User: Register Form.

If one of the inserted values is not correct an error message is displayed. Read the error message that provides information on how to correct the value inserted for the field coloured in red.

Note: Choose a strong and easy-to-remember password for your account; do not write it down or communicate to others. Avoid common phrases and words. Strong passwords are long enough and have a combination of lowercase and uppercase letters, numbers, and special characters.

2.5 Login

You should receive a confirmation email after your user account request has been validated by an administrator. Now, you can login by visiting the main page or <https://justmarkit.uk/index.php?action=login>. The login page is shown in Figure 7.

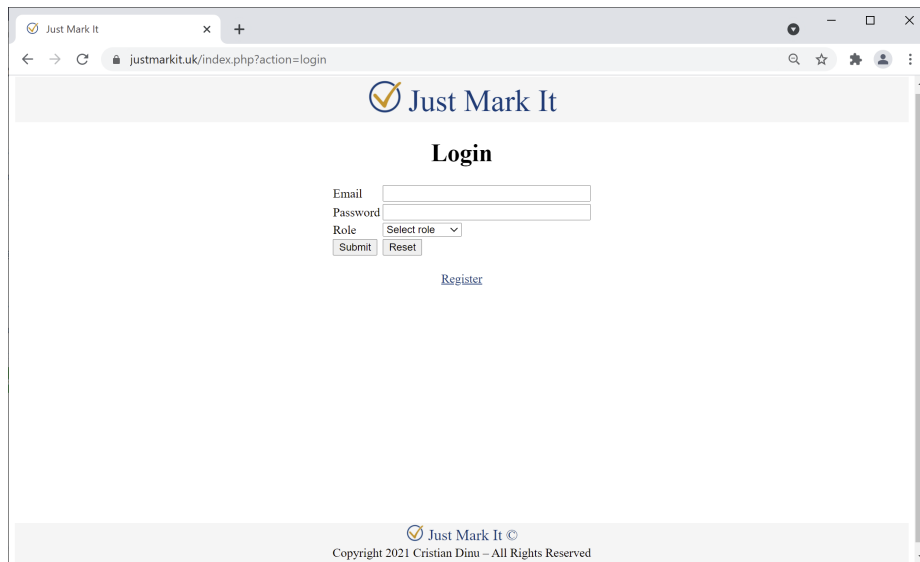
A screenshot of a web browser displaying the login page for 'Just Mark It'. The browser's address bar shows 'justmarkituk/index.php?action=login'. The page has a light gray header with the 'Just Mark It' logo (a blue checkmark in a circle) and the text 'Just Mark It'. Below the header, the word 'Login' is centered in bold. The login form consists of three input fields: 'Email', 'Password', and 'Role'. The 'Role' field is a dropdown menu with 'Select role' as the placeholder text. Below these fields are two buttons: 'Submit' and 'Reset'. A blue link labeled 'Register' is positioned below the 'Reset' button. At the bottom of the page, there is a footer with the 'Just Mark It' logo, the text 'Copyright 2021 Cristian Dinu - All Rights Reserved', and a small copyright notice.

Figure 7: User: Login Form.

Insert the following information:

Email The email address of the account

Password The account password

Role Role of the user

If any of the above-mentioned values is wrongly typed, a generic error message is displayed in red as shown in Figure 8. The error message is not precise to prevent attacks on the existing user accounts.

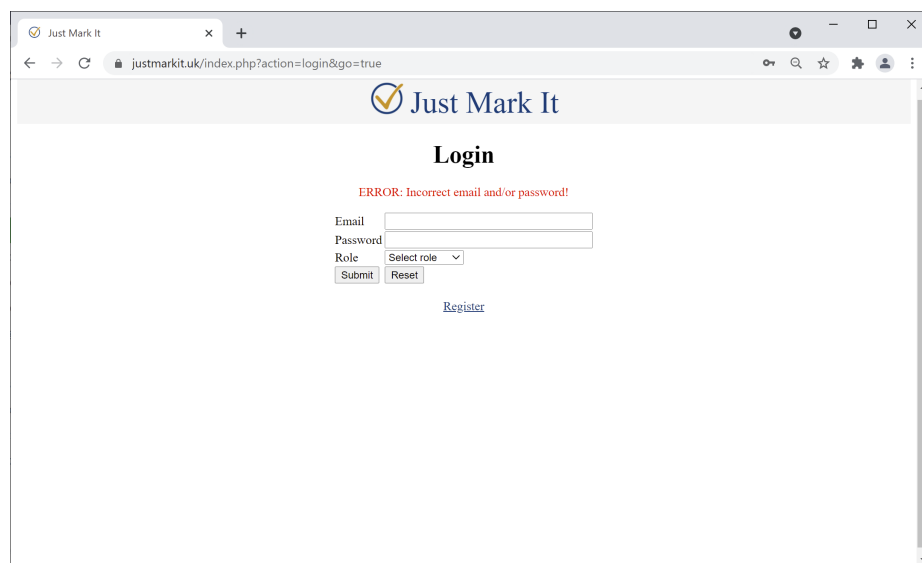


Figure 8: User: Login Form Error.

2.6 Change Password

To change a password, an authenticated user can click on their name on the top right side of the application screen. A form as the one in Figure 9 is displayed. Input fields:

New Password* The new password

Confirm New Password* Confirm the new password

Insert the new password and confirm the new password. Then click submit to change the password.

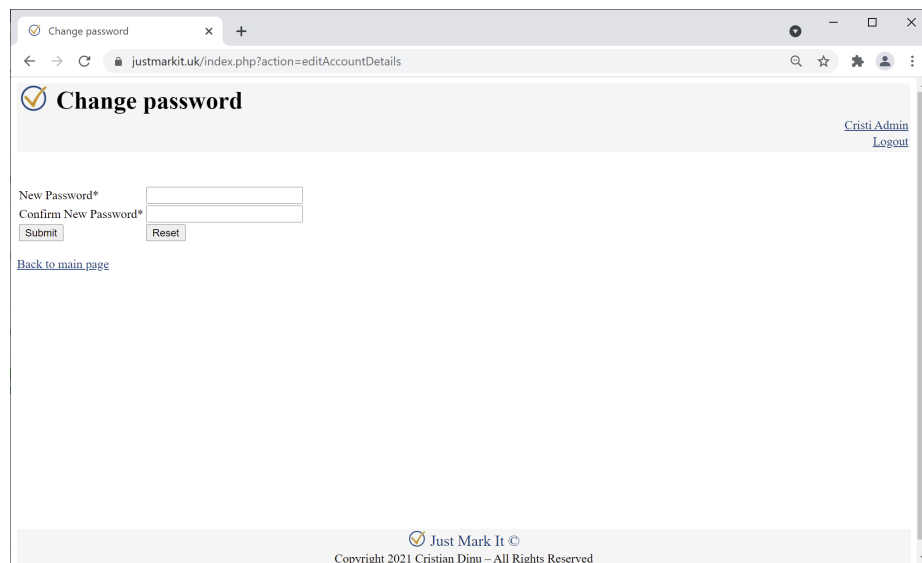


Figure 9: User: Change Password Form.

Note: Choose a strong and easy-to-remember password for your account; do not write it down or communicate to others. Avoid common phrases and words. Strong passwords are long enough and have a combination of lowercase and uppercase letters, numbers, and special characters.

2.7 Logout

To logout simply click on the *Logout* link on the top right side of the screen. Once successfully logged out, you should see the login form and the message “You logged out.”.

2.8 Navigation

For authenticated users, the application displays a navigation bar below the page title. The navigation bar informs the user about the position of the current page with respect to the course structure and facilitates quick navigation to other pages. An example of the navigation screen is shown in Figure 10.

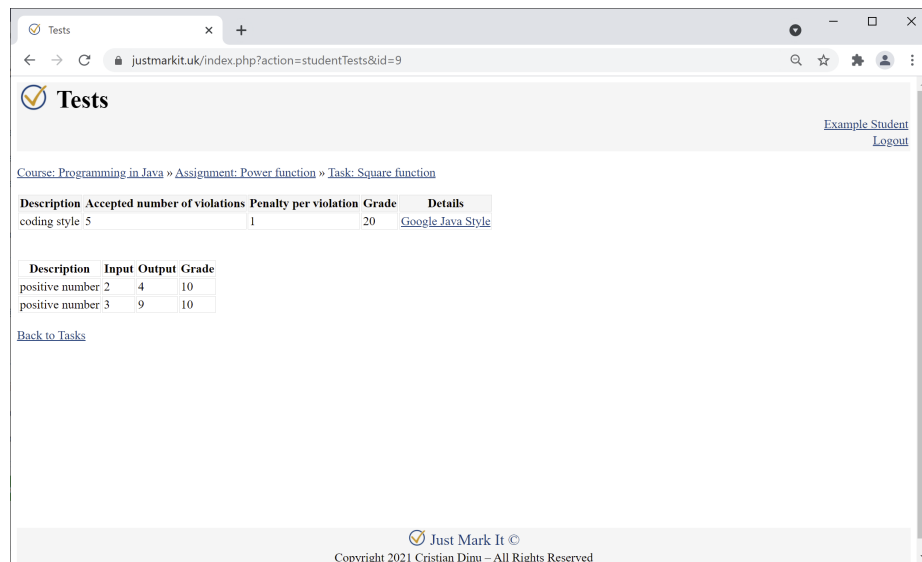


Figure 10: User: Navigation Bar.

2.9 Access Forbidden

When an user attempts to access a page that it is not defined or they are not entitled to access, an error screen as the one shown in Figure 11 is displayed. The user can return to the previous page by clicking on the *home* link.

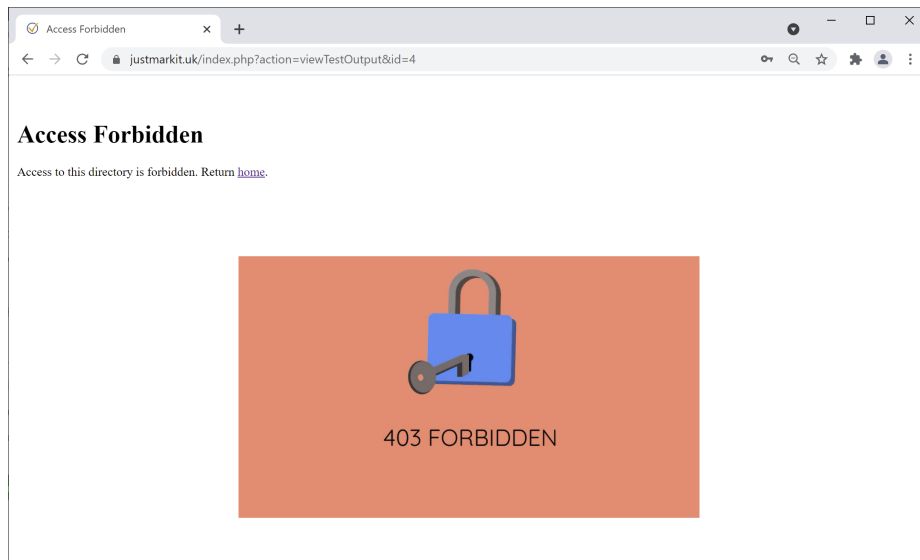


Figure 11: User: Access Forbidden.

3 Administrator

3.1 Users

An administrator can see all users registered in the application. They can filter users by their role (administrator, professor, student) and by their validity (i.e. valid or invalid). An example of the users screen is shown in Figure 12.

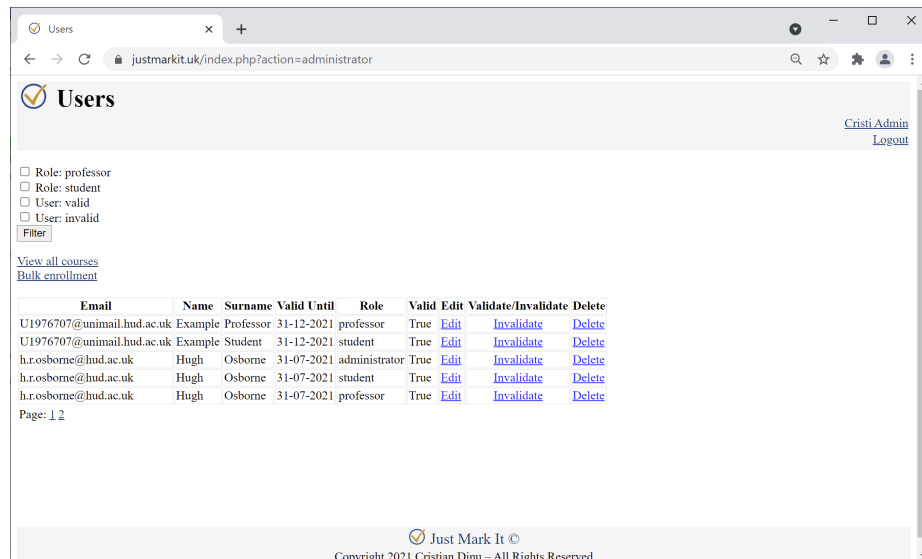


Figure 12: Administrator: Users.

3.1.1 Edit

By clicking on the *Edit* link corresponding to a user, the administrator can edit the details of that user account. An example of the user edit screen is shown in Figure 13.

The following fields can be edited:

Name Name of the user

Surname Surname of the user

End Date Date until when the account is valid

Role Role of the user

3.1.2 Validate/Invalidate

An administrator can validate a user account by clicking on the *Validate* link. All user registration requests are visible to the administrator, who can validate them. Similarly, the administrator can invalidate a user account by clicking on the *invalidate* link. An invalid user cannot authenticate in the **Just Mark It** application.

Browser address bar: justmarkituk/index.php?action=editUser&id=3

Edit user

[Cristi Admin](#)
[Logout](#)

Name:
Surname:
End Date:
Role:

[Requests](#)

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Figure 13: Administrator: Edit User.

3.1.3 Delete

An administrator can delete a user account from the application by clicking on the *Delete* link.

Note: This operation is permanent and there is no way to undo it. A deleted user cannot access the **Just Mark It** application.

3.2 Courses

An administrator can see all courses defined in the application. An example of the administrator screen that shows the courses that were defined in the [Just Mark It](#) application is shown in Figure 14.

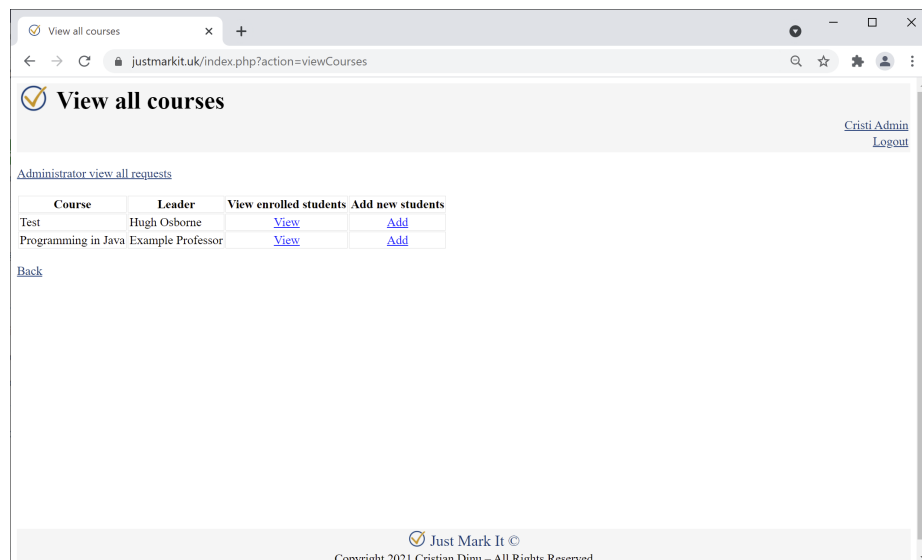


Figure 14: Administrator: Courses.

3.2.1 View Enrolled Students

An administrator can view the students enrolled in a course by clicking on the *View enrolled students* link. An example of the administrator screen is shown in Figure 15. An administrator can remove a student from the course by clicking on the *Remove* link that corresponds to that student.

3.2.2 Add New Students

An administrator can add new students to a course by clicking on the *Add new students* link. A screen similar to the one shown in Figure 16 is displayed, and the administrator can click on the *Add* link corresponding to the student to be added to the course.

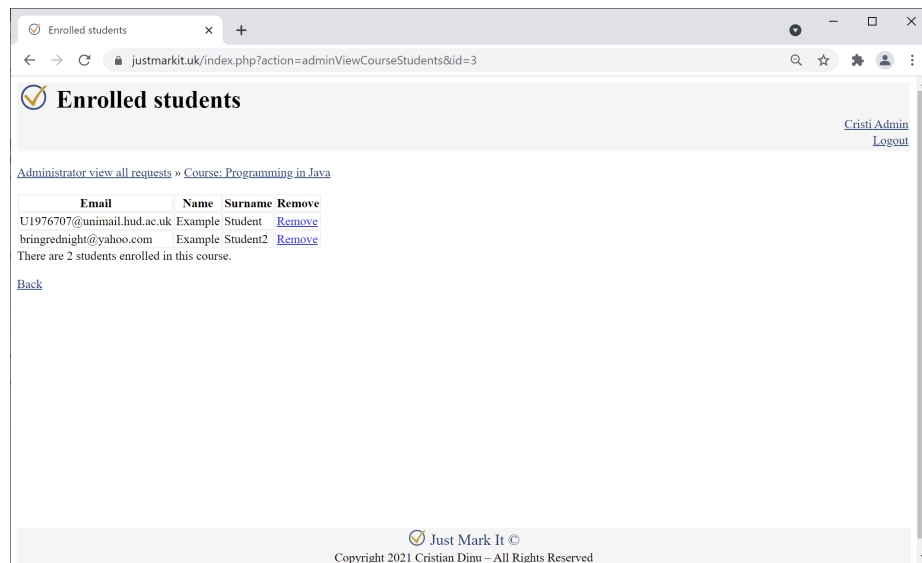


Figure 15: Administrator: View Enrolled Students.

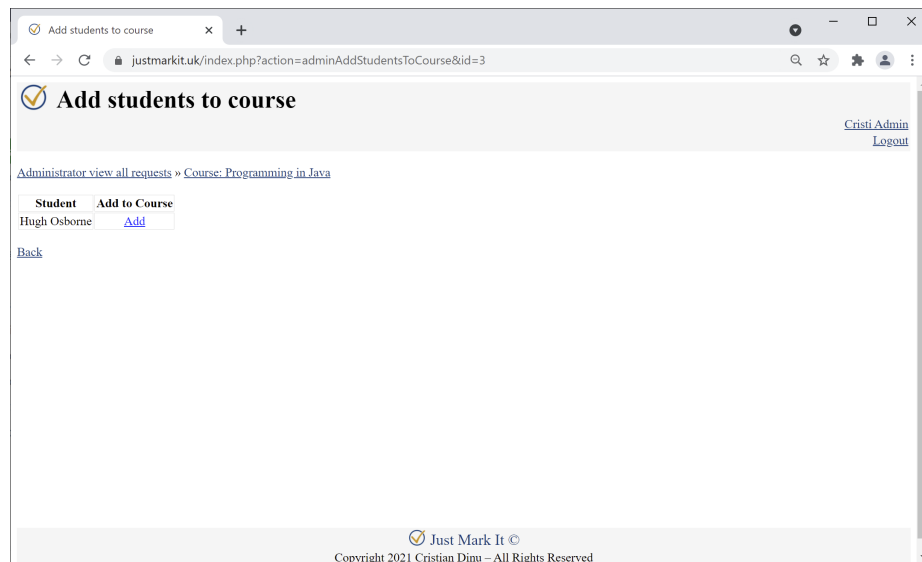


Figure 16: Administrator: Add New Students.

3.3 Bulk Enrolment

An administrator can enroll multiple students via a bulk enrolment. The application screen that allows this operation is shown in Figure 17. The bulk enrolment page shows information about the expected format of the input Comma-Separated Values (CSV) file.

Bulk enrollment

[Cristi Admin](#)
[Logout](#)

The file must have the following columns(email, password, name, surname, end date, role) in the exact same order as in the example below:

Email	Password	Name	Surname	End date	Role
example@justmarkit.uk	pass	Cristian	Dimu	01-01-2022	2

List of roles:

Role	Id
administrator	1
professor	2
student	3

Note: the file must be of type .csv

Select file to upload: No file chosen

[Back](#)

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Figure 17: Administrator: Bulk Enrolment.

4 Professor

4.1 Courses

A professor can view all courses for which they are a module leader. Figure 18 shows an example of this screen.

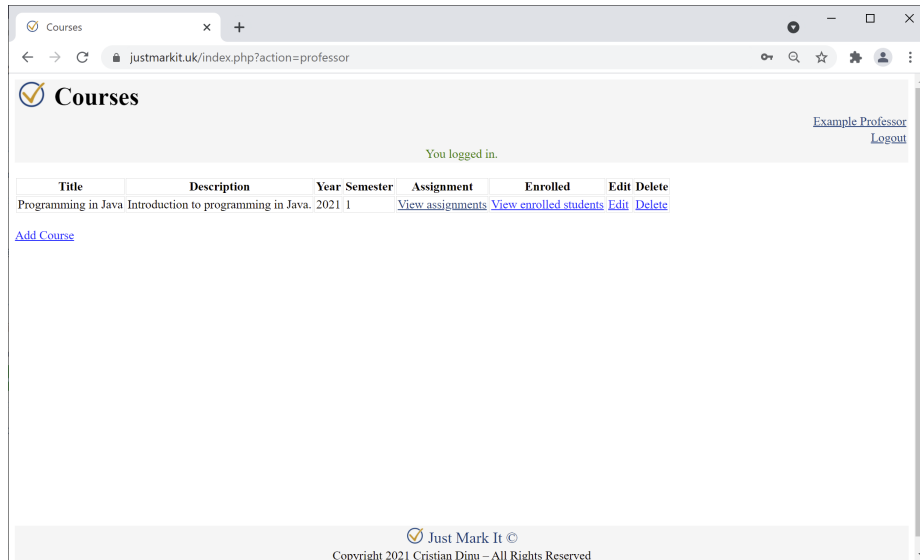


Figure 18: Professor: Courses.

4.1.1 View Assignments

A professor can view the assignments of a course by clicking on the *View assignments* link from the courses screen. See Section 4.2 for more details.

4.1.2 View Enrolled Students

A professor can view the students enrolled in a course by clicking on the *View enrolled students* link that corresponds to that course. A screen as the one shown in Figure 19 is displayed.

4.1.3 Add

A professor can create a new course by clicking on the *Add Course* link from the courses screen. A form as the one shown in Figure 20 is shown. The professor must insert the following values:

- Title*** The title of the course
- Description*** The description of the course
- Year** The year in which the course is taught
- Semester** The semester in which the course is taught

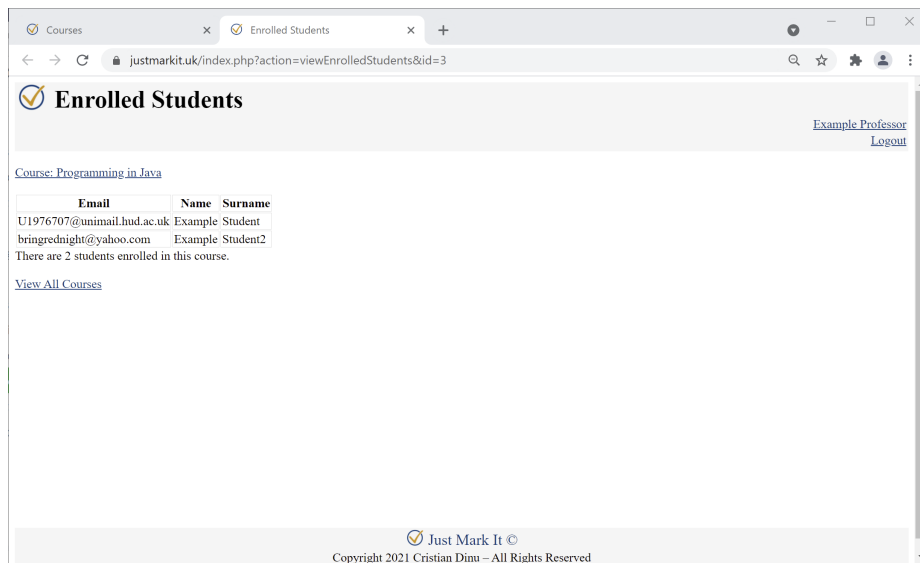


Figure 19: Professor: Enrolled Students.

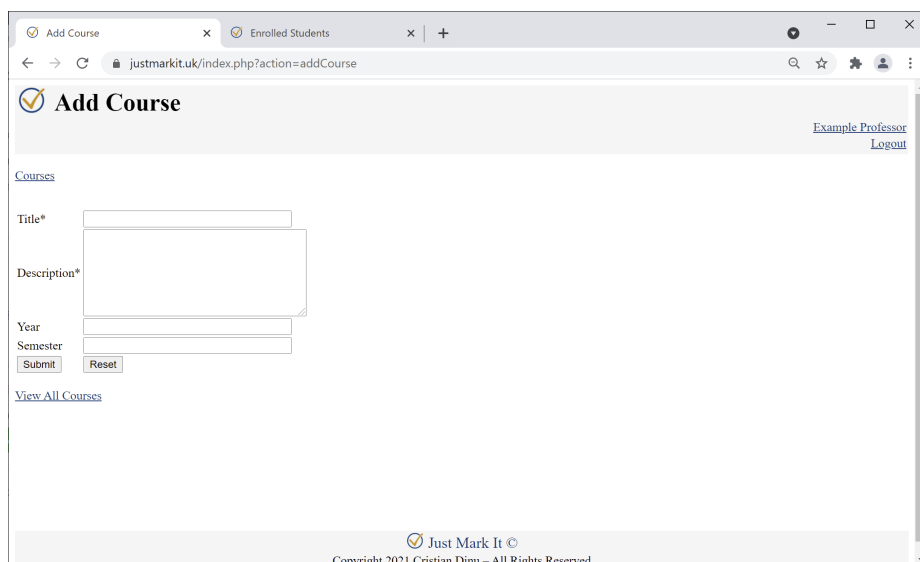


Figure 20: Professor: Add Course Form.

4.1.4 Edit

To edit a course, a professor must click on the *Edit* link corresponding to that course. This action opens a form as the one shown in Figure 21. The following fields can be edited:

Title* The title of the course

Description* The description of the course

Year The year in which the course is taught

Semester The semester in which the course is taught

Edit Course

Enrolled Students

justmarkit.uk/index.php?action=editCourse&id=3

Example Professor
Logout

Course: [Programming in Java](#)

Title*
Programming in Java
Introduction to programming in Java.

Description*

Year
2021

Semester
1

Submit Reset

[View All Courses](#)

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Figure 21: Professor: Edit Course Form.

4.1.5 Delete

A professor can delete a course by clicking on the *Delete* link that corresponds to the course to be deleted.

4.2 Assignments

A professor can view the assignments of a course by clicking on the *View assignments* link from the courses screen. A screen similar to the one shown in Figure 22 is shown.

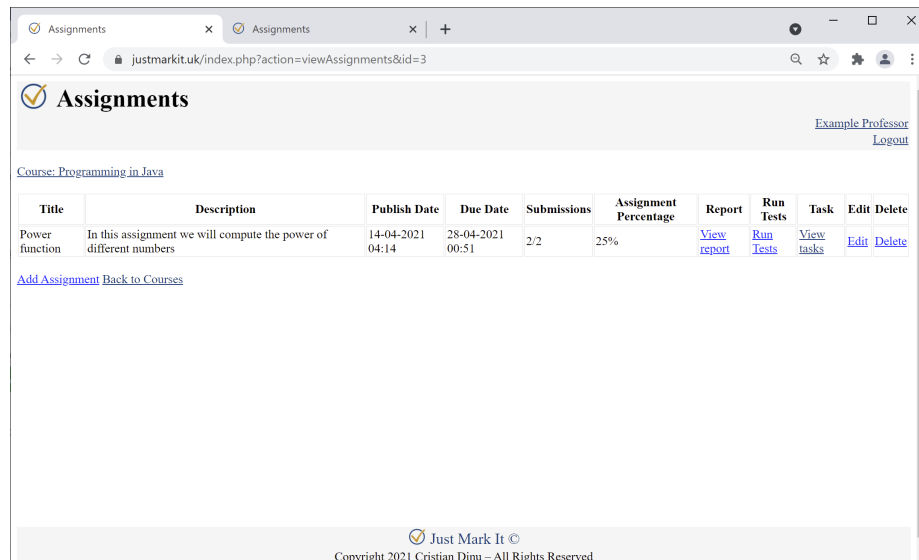


Figure 22: Professor: Assignments.

4.2.1 View Report

A professor can view the report generated for an assignment by clicking on the *View report* link. For example, a report is shown in Figure 23.

In addition to the assignment report that aggregates the results of all students, a professor can view a report for each student by clicking on the link corresponding to that student. Moreover, a professor can print the assignment report by clicking on the *Print Report* link.

4.2.2 Run Tests

A professor can run all the defined tests for all student submissions to an assignment by clicking on the *Run Tests* link. After clicking on that link, the professor can see how many tests are scheduled to be executed by the marking server. The displayed values are updated as the marking server executes the tests.

4.2.3 View Tasks

A professor can see the tasks of an assignment by clicking on the *View tasks* link that corresponds to that assignment in the assignments screen. See Section 4.3 for more details.

4.2.4 Add

A professor can add an assignment by clicking on the *Add Assignment* link on the assignments screen. The form that must be filled in is shown in Figure 24. The fields of this forms are:

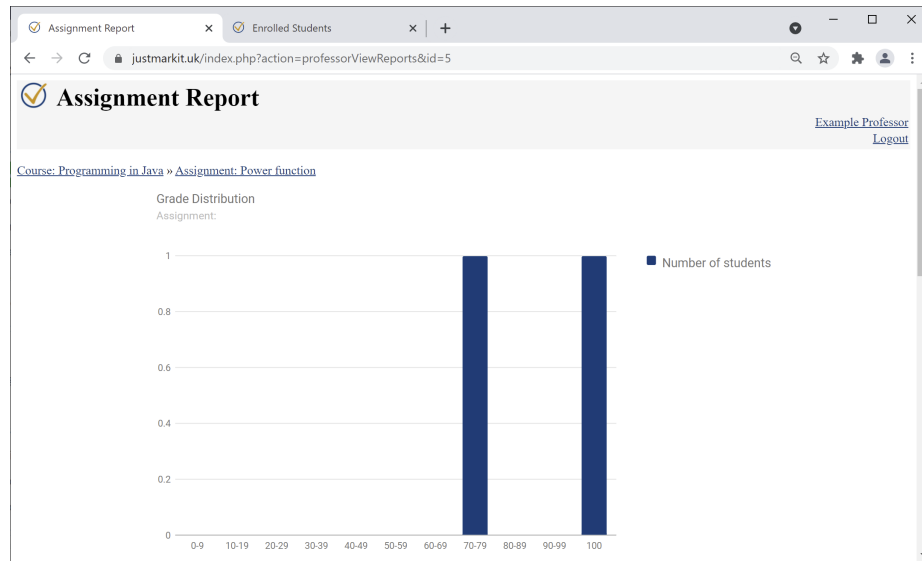


Figure 23: Professor: Assignment Report.

Title* The title of the assignment

Description* The description of the assignment

Publish date* The date when the assignment is published

Due date* The due date of the assignment

Assignment percentage* The percentage of this assignment in the final mark of the course

4.2.5 Edit

A professor can edit an assignment by clicking on the *Edit* link corresponding to that assignment in the assignments screen. A form similar to the one in Figure 25 is shown. The professor can modify the following fields:

Title* The title of the assignment

Description* The description of the assignment

Publish date* The date when the assignment is published

Due date* The due date of the assignment

Assignment percentage* The percentage of this assignment in the final mark of the course

4.2.6 Delete

A professor can delete an assignment by clicking on the *Delete* link that corresponds to the assignment to be deleted.

justmarkituk/index.php?action=addAssignment&id=3

Add Assignment

[Example Professor](#)
[Logout](#)

Course: [Programming in Java](#) > [Assignments](#)

Title*

Description*

Publish Date*

Due Date*

Assignment Percentage*

[View All Assignments](#)

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Figure 24: Professor: Add Assignment Form.

justmarkituk/index.php?action=editAssignment&id=5

Edit Assignment

[Example Professor](#)
[Logout](#)

Course: [Programming in Java](#) > [Assignment: Power function](#)

Title*

Description*

Publish Date*

Due Date*

Assignment Percentage*

[View All Assignments](#)

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Figure 25: Professor: Edit Assignment Form.

4.3 Tasks

A professor can see the tasks of an assignment by clicking on the *View tasks* link that corresponds to that assignment in the assignments screen. A tasks screen is shown as an example in Figure 26.

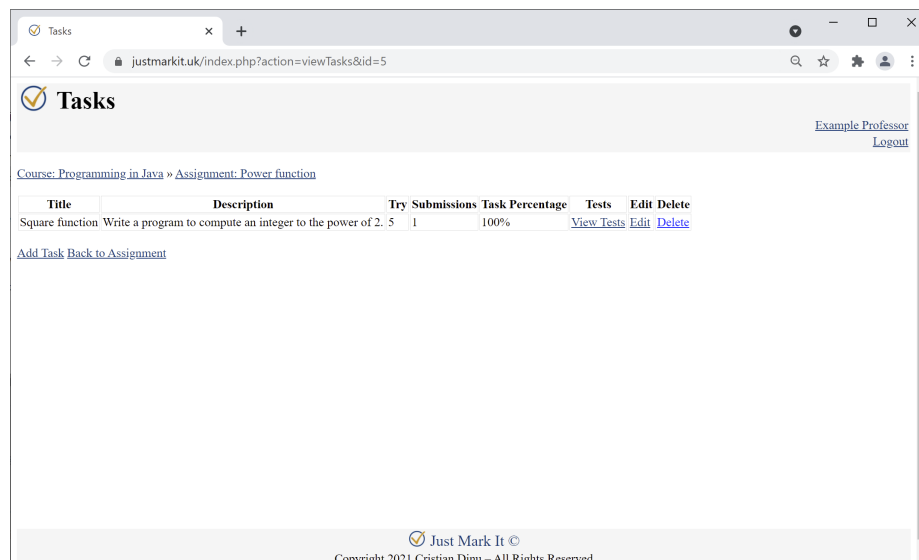


Figure 26: Professor: Tasks.

4.3.1 View Tests

A professor can see the tests defined for a task by clicking on the *View Tests* link of that task. See Section 4.4 for more details.

4.3.2 Add

To add a new task, a professor must click on the *Add Task* link visible on the tasks screen. The form that allows one to add a task is depicted in Figure 27. Values for the following fields must be provided:

Title* The title of the task

Description* The description of the task

Java class name* The name of the Java class that a student must implement

No of submissions* The maximum number of submissions a student is allowed to make to this task

Task percentage* The percentage of this task in the final mark of the assignment

Figure 27: Professor: Add Task Form.

4.3.3 Edit

A professor can edit a task by clicking on the *Edit* link that corresponds to the task to be edited in the tasks screen. An example of the form that allows a professor to edit a task is shown in Figure 28. The fields that can be edited are:

Title* The title of the task

Description* The description of the task

Java class name* The name of the Java class that a student must implement

No of submissions* The maximum number of submissions a student is allowed to make to this task

Task percentage* The percentage of this task in the final mark of the assignment

4.3.4 Delete

A professor can delete a task by clicking on the *Delete* link that corresponds to the task to be deleted in the tasks screen.

The screenshot shows a web browser window with the address bar displaying `justmarkit.uk/index.php?action=editTask&id=9`. The page title is "Edit Task". In the top right corner, there are links for "Example Professor" and "Logout". Below the header, a breadcrumb trail reads: "Course: Programming in Java » Assignment: Power function » Task: Square function". The form contains the following fields and controls:

- Title***: A text input field containing "Square function".
- Description***: A text area containing "Write a program to compute an integer to the power of 2.".
- Java class name***: A text input field containing "Xto2".
- Nr of submissions***: A text input field containing "5".
- Task Percentage***: A text input field containing "100".
- Below the percentage field are two buttons: "Submit" and "Reset".

At the bottom left of the form area is a link: [View All Tasks](#). The footer of the page contains the "Just Mark It" logo and the text "Copyright 2021 Cristian Dinu – All Rights Reserved".

Figure 28: Professor: Edit Task Form.

4.4 Tests

A professor can see the tests defined for a task by clicking on the *View Tests* link of that task. A tests screen is shown as an example in Figure 29.

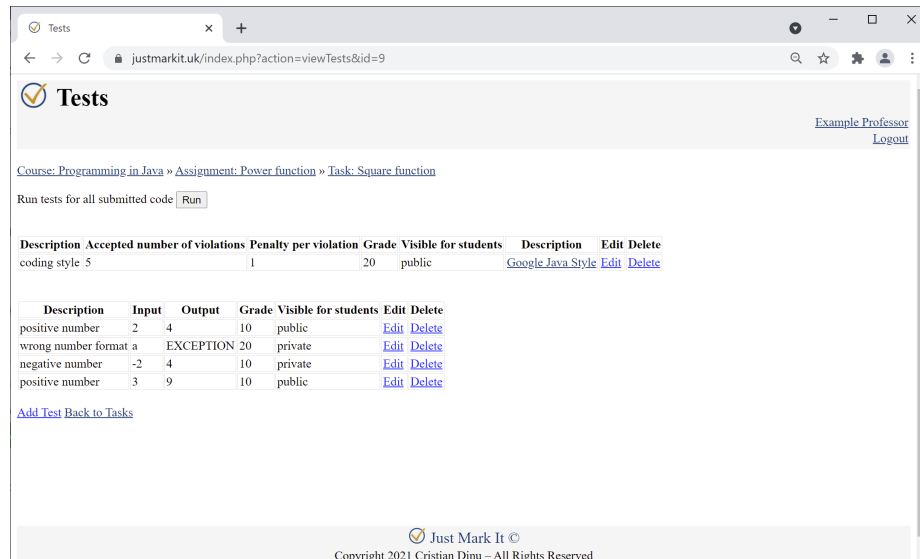


Figure 29: Professor: Tests.

4.4.1 Run

A professor can run all tests for all the code submitted by students by clicking on the *Run* button on the tests screen.

4.4.2 Add

A professor can add a new test by clicking on the *Add Test* link visible on the tests screen. The form that allows one to add a test is depicted in Figure 30. Values for the following fields must be provided:

Description* The description of the test

Input test* The inputs of the test

Output test* The expected outputs of the test

Grade* The grade of the test

Visible for student* Indicates whether the test is visible to a student (i.e. *public*) or not (i.e. *private*) before the assignment due date

Figure 30: Professor: Add Test Form.

4.4.3 Edit

A professor can edit an existing test by clicking on the *Edit* link that corresponds to that test in the tasks screen. The form that allows a professor to edit a test is depicted in Figure 31. The following fields can be edited:

Description* The description of the test

Input test* The inputs of the test

Output test* The expected outputs of the test

Grade* The grade of the test

Visible for student* Indicates whether the test is visible to a student (i.e. *public*) or not (i.e. *private*) before the assignment due date

4.4.4 Delete

A professor can edit a test by clicking on the *Delete* link that corresponds to the test to be deleted in the tests screen.

The screenshot shows a web browser window with the address bar displaying `justmarkit.uk/index.php?action=editTest&id=17`. The page title is "Edit Test". In the top right corner, there is a user profile for "Example Professor" with a "Logout" link. Below this, a breadcrumb trail reads: "Course: Programming in Java » Assignment: Power function » Task: Square function » Tests". The form contains several fields: "Description*" with the value "positive number", "Input test*" with the value "2", and "Output test*" with the value "4". There is also a "Grade*" field with the value "10" and a "Visible for student*" dropdown menu set to "public". At the bottom of the form are "Submit" and "Reset" buttons. A link "View All Tests" is located below the form. The footer of the page includes the "Just Mark It" logo and the text "Copyright 2021 Cristian Dinu - All Rights Reserved".

Figure 31: Professor: Edit Test Form.

5 Student

5.1 Courses

A student can see all courses they are enrolled in. Figure 32 exemplifies a screen that shows courses to which a student is enrolled in.

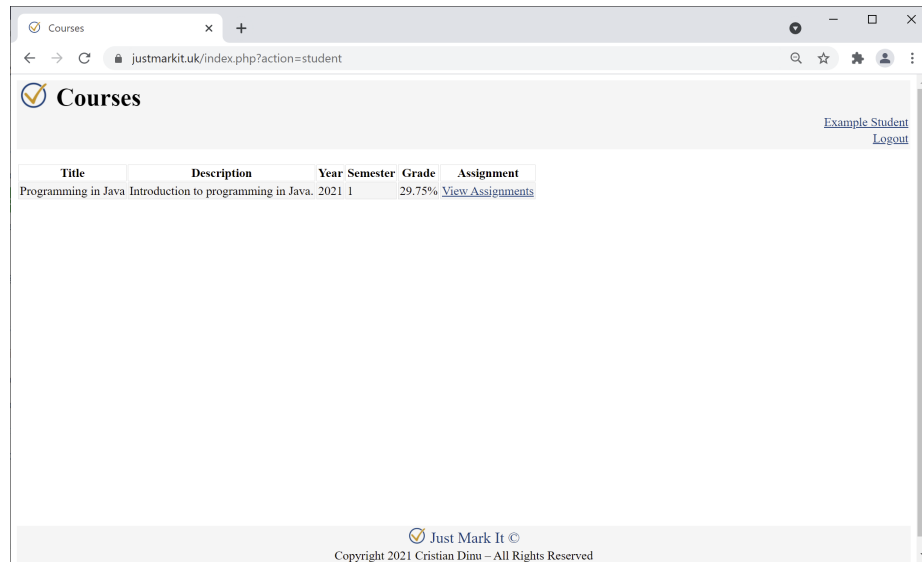


Figure 32: Student: Courses.

5.1.1 View Assignments

A student can view the assignments added to a course by a professor by clicking on the *View Assignments* link of that course. See Section 5.2 for more details.

5.2 Assignments

A student can view assignment added to a course by a professor by clicking on the *View Assignments* link of that course in the courses screen. An example of the screen that shows the assignments of a course as viewed by a student is given in Figure 33.

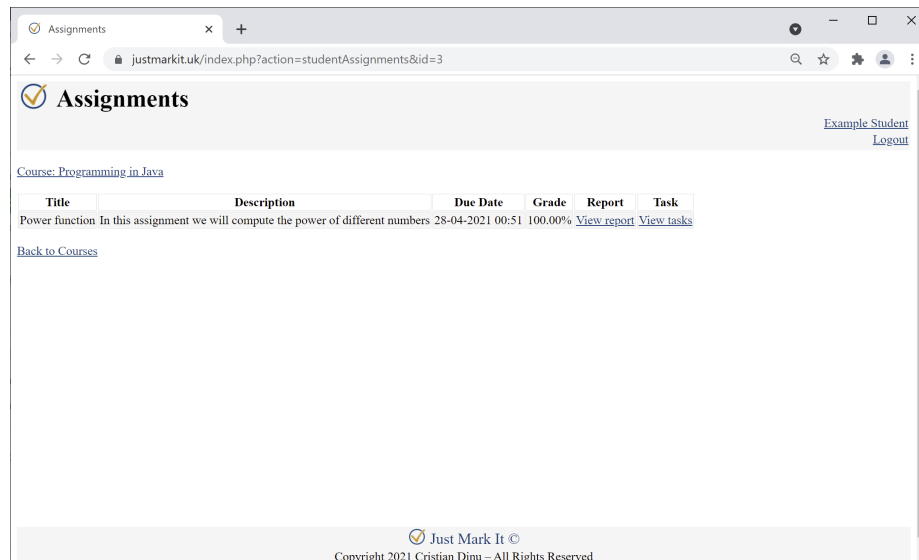


Figure 33: Student: Assignments.

5.2.1 Report

A student can view an assignment report after the grade release date has passed. To that end, the student must click on the *View report* link of that assignment in the assignments screen. An example of a report generated for a student is shown in Figure 34.

5.2.2 View Tasks

A student can view the tasks defined by a professor for an assignment by clicking on the *View tasks* link of that assignment in the assignments screen. See Section 5.3 for more details.

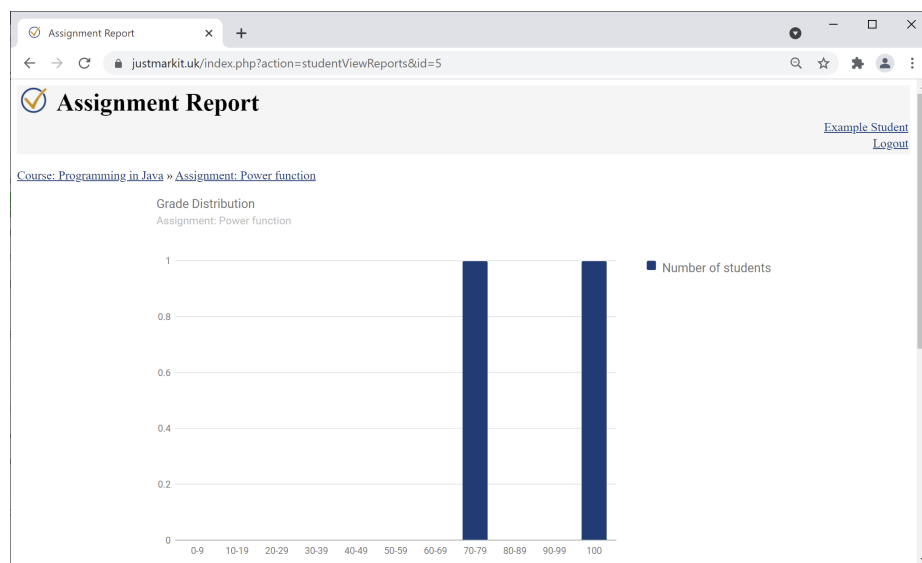


Figure 34: Student: Report.

5.3 Tasks

A student can view the tasks defined by a professor for an assignment by clicking on the *View tasks* link of that assignment in the assignments screen. Figure 35 provides an example of how tasks are displayed in the application interface.

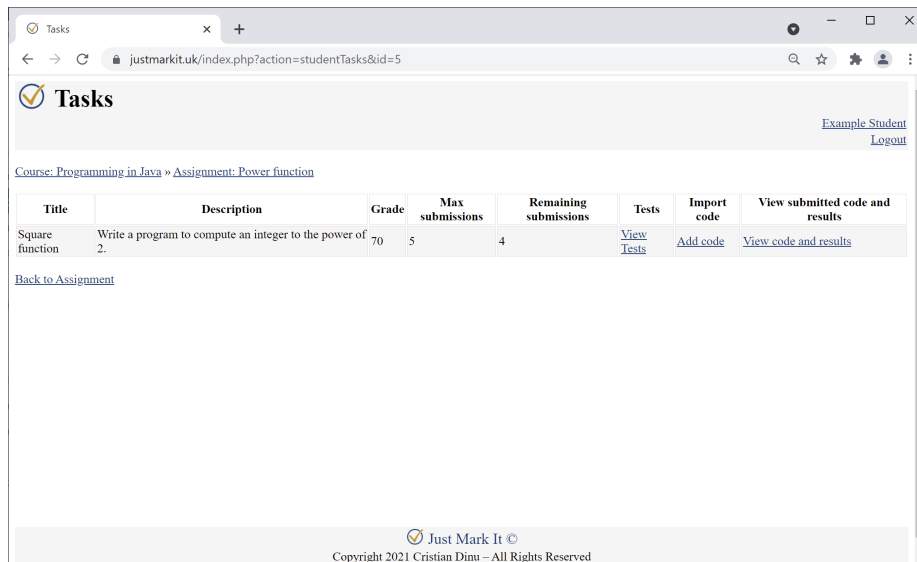


Figure 35: Student: Tasks.

5.3.1 View Tests

A student can view the tests defined for a task by clicking on the *View Tests* link on the tasks screen. The student can see only the public tests defined by a professor in this interface. An example of the tests visible by a student after due date has passed is shown in Figure 36.

5.3.2 Add Code

A student can submit a solution to a task by clicking on the *Add code* link corresponding to that task in the tasks screen. This form is enabled between the assignment publish date and the assignment due date. After the assignment due date, a student cannot submit code anymore. Figure 37 shows the application interface for the add code operation after the assignment due date has passed.

5.3.3 Submitted Code

To see the submitted code and the results obtained after running the tests on that code, a student can click on the *View code and results* link from the tasks screen. See Section 5.4 for more details.

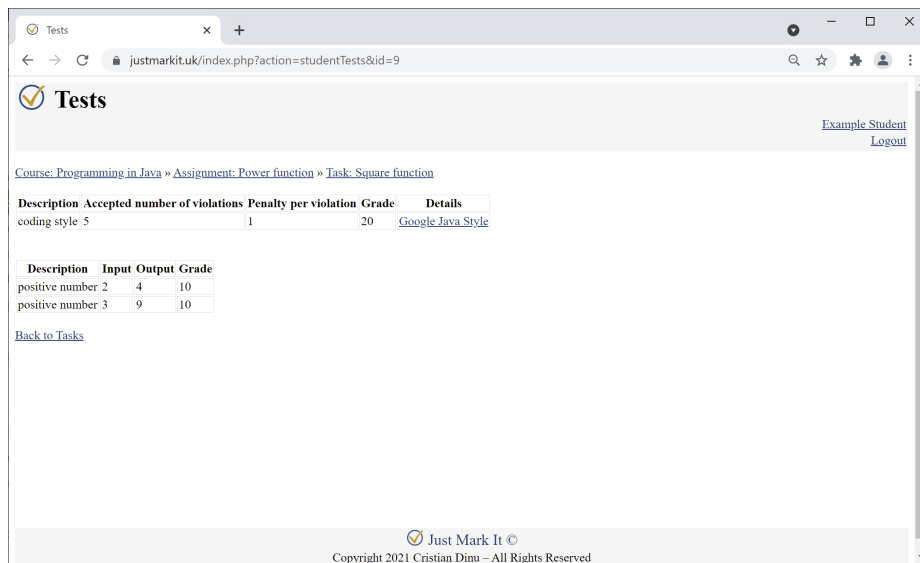


Figure 36: Student: Tests.

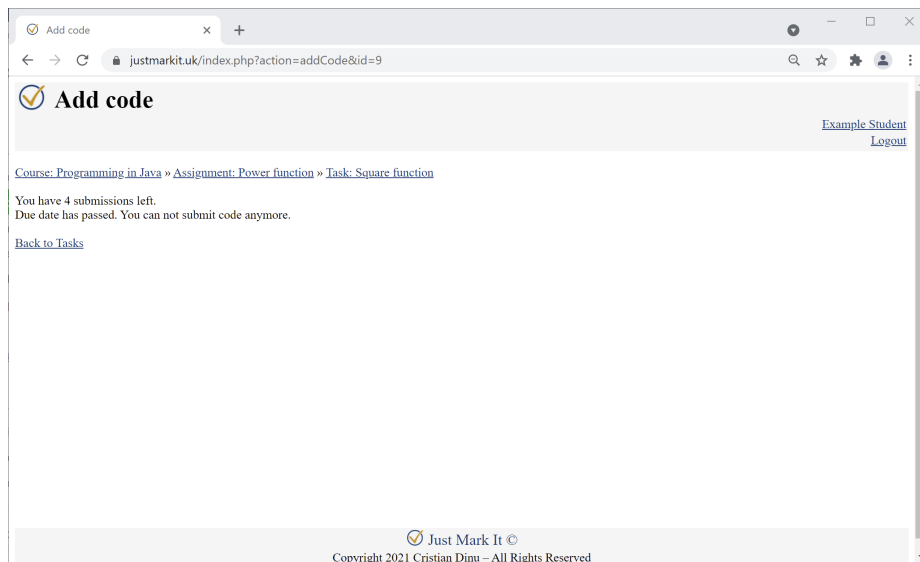


Figure 37: Student: Add Code.

5.4 Submitted Code

To see the submitted code and the results obtained after running the tests on that code, a student can click on the *View code and results* link from the tasks screen. An example of what a student can see on the submitted code screen is provided in Figure 38.

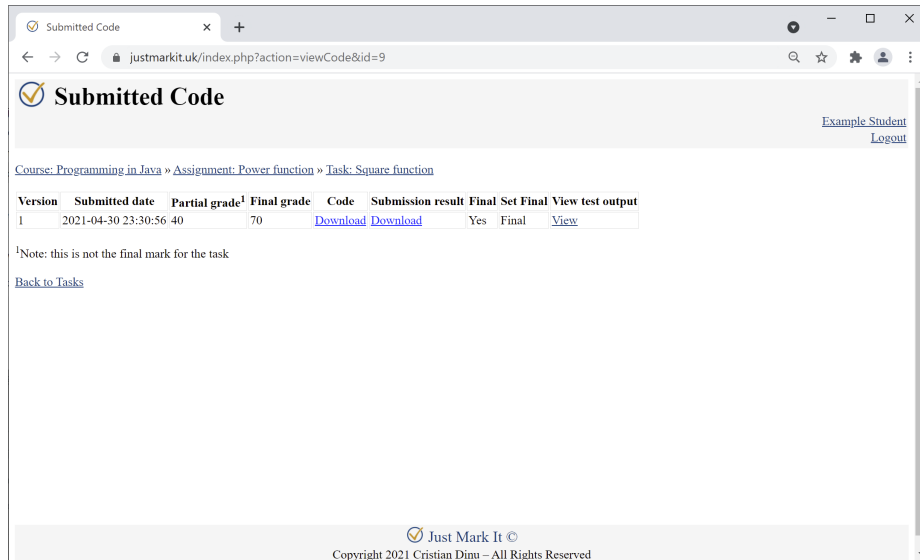


Figure 38: Student: Submitted Code.

5.4.1 Download Code

From the submitted code screen a student can download the code they submitted by clicking on the *Download* link in the *Code* column.

5.4.2 Download Submission Result

From the submitted code screen a student can download the submission result for the code they submitted by clicking on the *Download* link in the *Submission result* column.

5.4.3 View Tests Output

From the submitted code screen a student can view the test output for the code they submitted by clicking on the *View* link in the *View test output* column. The tests outputs screen shows the results of public tests only before the due date has passed. After the grade release date has passed, it includes the results of the private tests as well. An example of tests output after the grade release date has passed is shown in Figure 39.

View Test Output

[Example Student](#)
[Logout](#)

Course: [Programming in Java](#) » Assignment: [Power function](#) » Task: [Square function](#) » [View Code](#)

Submission version	Test description	Visible to student	Input	Expected output	Actual output	Passed	Available grade	Obtained grade
1	positive number	Visible	2	4	4	Passed	10	10
1	wrong number format	Not visible	a	EXCEPTION	EXCEPTION	Passed	20	20
1	negative number	Not visible	-2	4	4	Passed	10	10
1	positive number	Visible	3	9	9	Passed	10	10
			Accepted number of violations	Penalty per violation				
1	coding style	Visible	5	1	Starting audit... Audit done.	Passed	20	20

[Back to Submitted Code](#)

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Figure 39: Student: Tests Output.

6 Conclusion

This user's manual provided basic examples on how to use the [Just Mark It](#) application. For more technical details and the rationale behind [Just Mark It](#), consider reading the report and presentation slides as well as watching the video presentation created by Cristian Dinu. Finally, do not hesitate to contact the author if you were not able to find an answer to your question.

Enjoy using the [Just Mark It](#) tool for automated marking of software!