~ Nito ~

Internationals

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Criteria	TA/Grader	Instructor
Presentation		
Overall		

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1. Introduction

Exams have always been a stressful experience both for examinees and examiners. While examinees worry about their results, examiners also try to make sure that the exam is fair for everybody and there is no cheating. After the exam is finished, grading is another painful task for examiners because of the difficulties of reading dozens of handwritings. The situation is even worse for programming exams: since it is not safe to allow examinees to write their codes using computers, examiners decide to use the old-fashioned paper/pencil method instead. However, papers introduce new limitations in the available space and representation of the code which leads to inconsistencies during the grading process. Moreover, this increases the problems of examinees, as a very small mistake in the very beginning of the code can result in the additional effort of erasing the whole source code and having to write it again!

This is where "Nito" (Latin word for "exam") comes in. This application creates a secure environment for the examinees to type the answers on their computers whilst helping examiners prevent cheating. The exams can be created and managed very easily thanks to the features included in "Nito". During the exam, examinees can write their solutions as if they are using simple text editors. Furthermore, grading exam solutions becomes as easy as reading digital texts meaning the inconsistency of writing by hand is removed.

This tool is created to be mainly used by Computer Engineering/Science examiners for easily creating and managing university exams, but others (e.g. school teachers, programming courses staff, interviewers) are more than welcome to use it in order to improve the quality of education and to simplify other processes i.e. employment interviews.
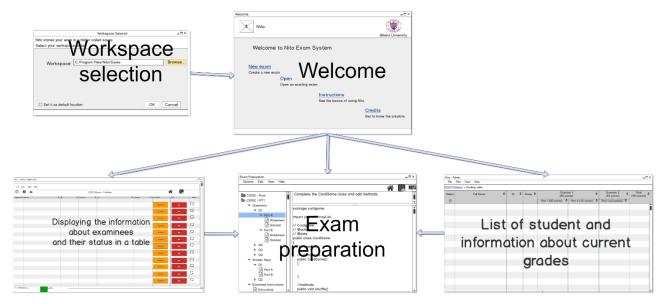
2. Details

"Nito" is designed to prevent possible digital cheating attempts during exams. However, "Nito" can't prevent physical cheating attempts such as cheating among two different people or use of written material. The best results are achieved when "Nito" is being used for onsite exams while examinees are under surveillance of assistants. That way, "Nito" can take care of digital cheating attempts while assistants prevent physical attempts, which leads to the safest results. On the other hand, "Nito" can also be used globally, but the administrators need to take extra measures for physical cheating attempts. "Nito" can't be held liable for any physical cheating.

In order to make the exam process easier, "Nito" consists of two different software interfaces. One of the interfaces provides facilities for exam admins to create and configure exams, add new questions and solution templates, invigilate examinees during the exam and grade their solutions. The other interface serves examinees during the examination and informs the admin about any cheating attempts. The detailed features of the "Nito" interfaces provided for examiners and examinees may be found below.
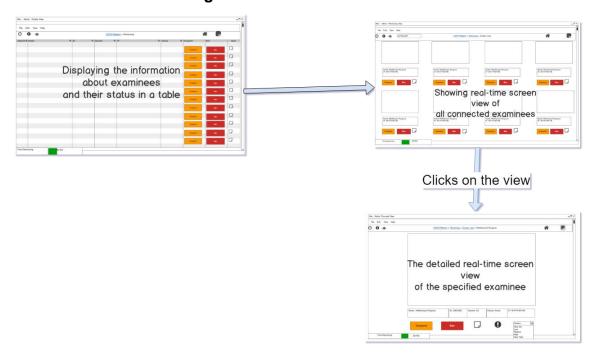
3. Storyboard

3.1 Examiner view
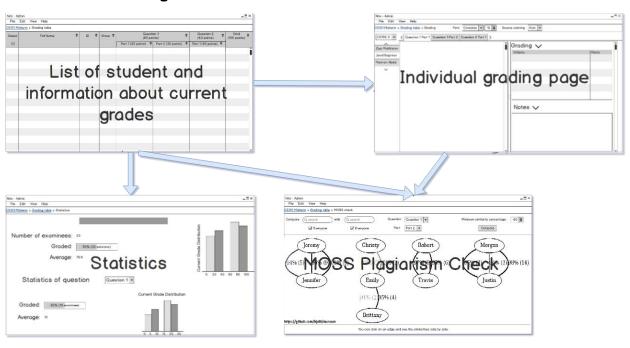
3.1.1 Exam preparation

The examiner gets the option of where to create the workspace in the workspace section. Then a Welcome section shows all the details. Then there are options; the Display View of all Students in a list and their respective information, Exam preparation manual view where the exam questions are to be made and another option displaying screen with a list of students and information about their current grades.

3.1.2 Admin View during Exam

This is how the images are displayed and changed during exam for the administrator view. Administrator has 3 options of switching between views; Simple view, Focused view and Monitoring view. The Examiner is shown the list of information about examinees and their statuses in a table form in the simple view. Later the Admin can select Screen view to show real-time screen views of all connected examinees. The examiner can also switch back to the list of all connected examinees in the table form back in the Simple Monitoring view. After Screen view for each connected examinee, the admin can get a focused view for any chosen examinee on the Monitoring screen by clicking on the screen of the desired examinee. The detailed real-time screen view of the specified examinee then opens in the so-called Focused view. The examiner also has the choice to switch back to simple informative view of the list of all connected examinees or go back to the monitored view of all connected examinees.
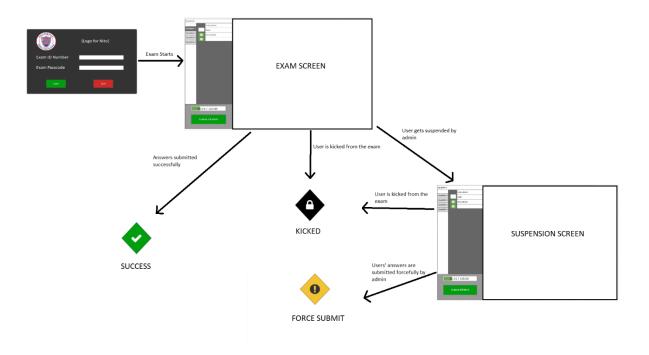
3.1.3 Grading View

The Administrator in the Grading View has the option to switch back and forth between Statistics, MOSS Plagiarism Check and Individual grading page when started from the view with the List of students and their information on current grades.

3.2 Examinee View

3.2.1 Working on Exam

The examinee has the first choice to input their credentials into the login screen of the program. Then the exam screen opens up and then the following respective screens are the ends of the exams and might possibly the suspension screen, if they are to be suspended.
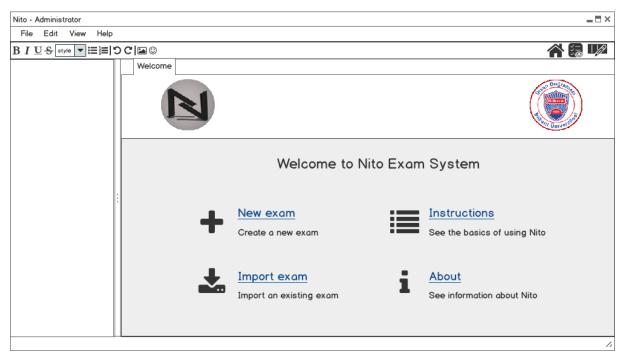
4. "Nito" – Administrator Interface

4.1 Exam Preparation Stage
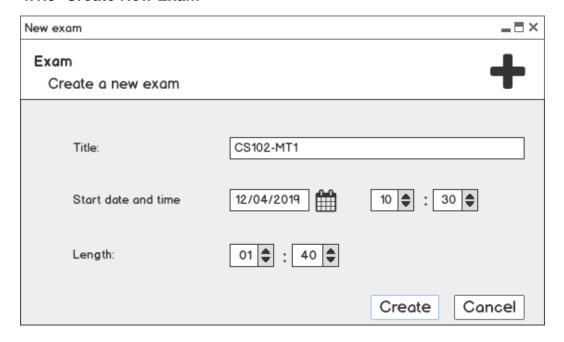
4.1.1 Creating a Workspace

The admin gets an option to choose where they would like to make their workspace on their computer with the option to browse to the file location. It can be set as the default location for all workspaces.
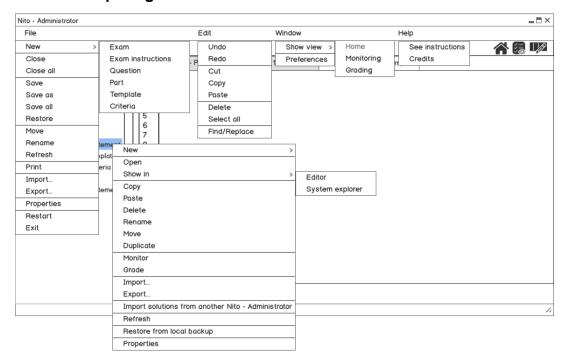
4.1.2 Options for Creating Exams

The admin can choose to create a new exam, open an existing one, see instructions for using "Nito" or get to know the creators of this application (hopefully).
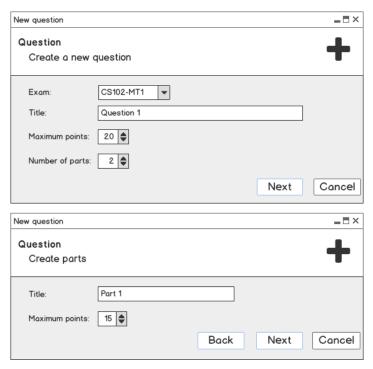
4.1.3 Create New Exam

The admin has the option to set the name of the exam, set the start date for the exam, the length of the exam. After filling out this info, the exam can be created.
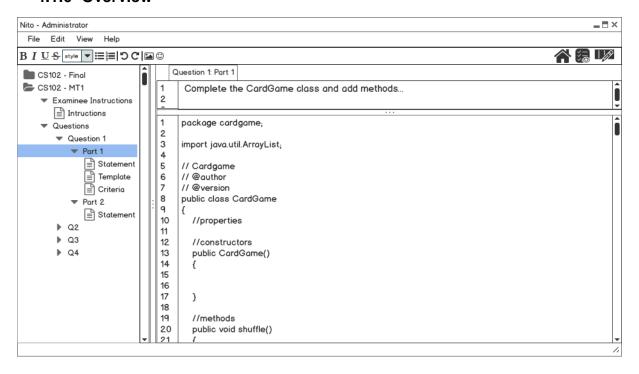
4.1.4 Preparing the Exam

The admin has a lot of options with which they can edit/create the exam as it can be seen above. All options provided above are self-explanatory.
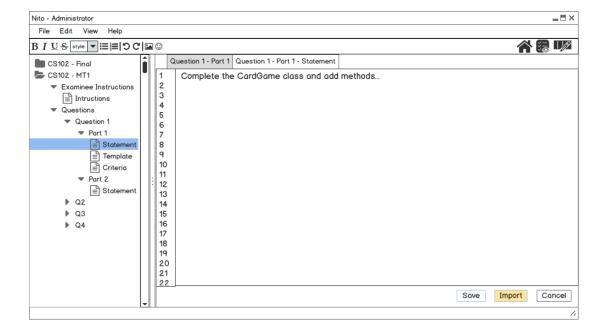
4.1.5 Adding Questions

The admin can add new questions by specifying which exam they pertain to. The admin must set a question name and specify how many parts it has.
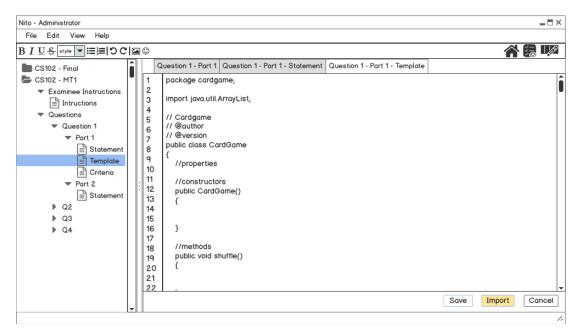
4.1.6 Overview

Above is a sample screen of how the exam preparation interface would look. The bar between the question and code is adjustable to allow the examiner/examinee to adjust the size of the window for easier access to the code or the question.

Above is where the question is added, questions can be added here or can be imported from elsewhere to save time.

The admin can leave the above part blank or provide the examinees with a template to help them understand the requirements of the question better and code that doesn't pertain to concepts needed in the exam can be given beforehand to the examinees.

Other than this, similarly, the admin can also add answer keys to help the grader grade the exams. Admins can also add instructions for the examinees in the space above that will tell them how to solve the question and in what way the examiner expects them to do so. The admin can also copy all their work to a new workspace. A directory can be browsed and set where the work will be created and that will become the new workspace. A list of all expected examinees for an exam can also be seen and a help guide can also be set to help examinees along.
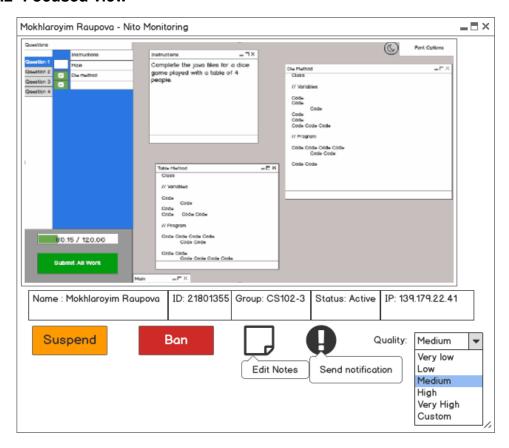
4.2 During the Exam
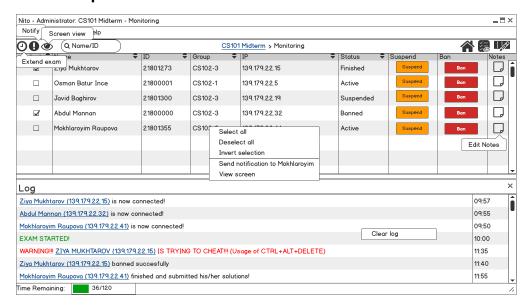
4.2.1 Monitoring View

The administrator of the exam receives the above "monitoring view" in which the admin can monitor all of the examinees participating in the exam. This view allows the examiner to keep an eye on the time remaining in the exam as well as on all the examinees at once including the number of them that are connected. At the top of each view provided of an examinee's screen, the admin can see the name of the examinee. Beneath these details the admin has the option to suspend, ban or make notes about that particular examinee. The Admin also has the option to find an examinee by name or IP Address using a search bar provided at the top left. This will allow the examiner to switch to a focused view of that examinee. The examiner also has the option to switch to the simple view by clicking the list icon on the top right. The exclamation icon allows the examiner to warn examinees too. There is also a log that shows the important actions in the color-coded format. Clicking on the links in log will automatically show that person.

4.2.2 Focused view

Focused view allows the examiner to focus on an individual examinee so that the admin can focus on the work of that examinee in the case that any suspicion regarding the examinee's actions arises. This view provides more details to the admin about the examinee. Other than Name and IP Address, this view will tell the examiner the section and the status of the examinee too. In addition, the admin can also suspend or ban the examinee if they are suspected of cheating and can also adjust the quality of the video feed if it lags. This view also shows the time remaining and the number of examinees connected, same as monitoring view. The admin can also keep notes on an examinee or warn him before deciding to suspend or ban him from the exam.
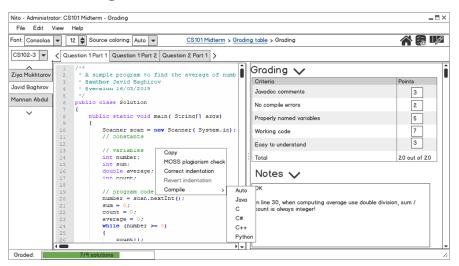
4.2.3 Simple View

The simple view allows the admin to view all the examinees at once along with all of their respective details which include Name, ID, Section Number, Status and IP Address. The admin retains the options to suspend or ban an examinee on this screen too and can similarly warn an examinee or add notes to them. Multiple examinees can be selected at once in simple view and the admin has the option to go back to the monitoring view from here. Time remaining and examinees connected are still shown in this view too. The examiner also has the option to extend the time of the exam and can also send individual notifications to examinees. The log is also visible in this view
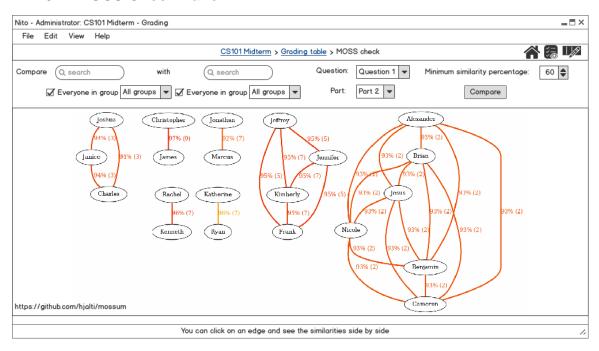
4.3 After the Exam – Grading

4.3.1 Main Grading Panel

The main grading panel of "Nito" provides the examinee with several options. The main view of this interface would contain 3 parts. The biggest panel of the 3 would show the examiner the examinee's code. The 2nd panel shows the examiner a checklist that the examiner can use to grade the code according to certain criteria, which can help the examiner keep track of where the examinee has lost points. The examiner can also make notes that can help the examinee realize where they have made mistakes, or the examiner can just provide extra tips to improve the code. The examiner also has the option to have the source code colored to make it easier to view certain keywords, the font type and
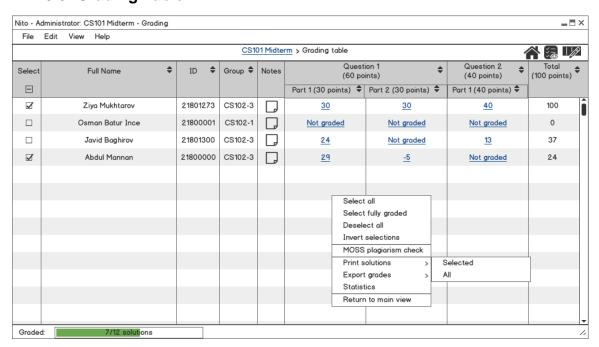
size can also be changed from here to fit the examiners comfort. Codes can be viewed section-wise by a drop-down menu and a list on the left of the interface shows the examiner the list of examinees from the selected section. After an examinee is selected, all the questions they have solved can be viewed in a bar on the top. Additional features on this page include the option to compile code in several different programming languages, the ability to correct indentation and, last but not the least, the ability to check for MOSS plagiarism.
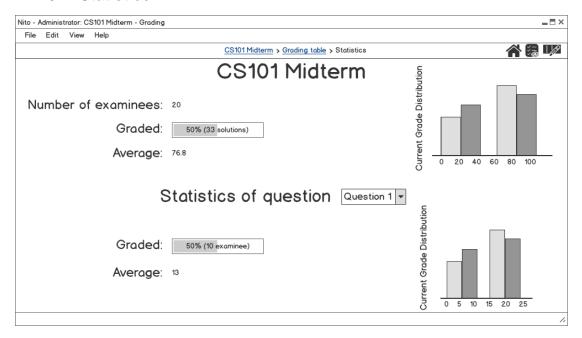
4.3.2 MOSS Check Panel

When using the MOSS check, the examiner can specify the minimum similarity percentage, which question to check, any sub-question and which 2 people to compare with or everyone's solution can be checked against all others. The result will then be shown in the form above.

4.3.3 Grading Table

The grading table allows the examiner to see all the details of the examinees who have given the exam and how many points they have gained in the exam. It also shows if the examiner has checked all of the examinees' exams yet and which parts may not have been graded. Additional features include being able to select all, select examinees who have been fully graded, deselect all, invert selections, MOSS plagiarism check, the ability to print solutions, export grades and the option to return to the main view.
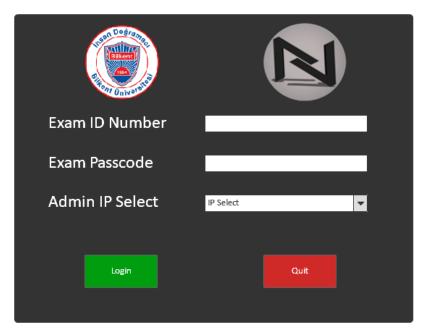
4.3.4 Statistics

If the examiner chooses to view the statistics, they can check overall statistics or the statistics of a question. Graphs of the results will be shown to the examiner along with a bar indicating how many examinees have had their solutions checked. Overall or partial averages will also be shown to the examiner along with the number of examinees whose statistics are being shown.
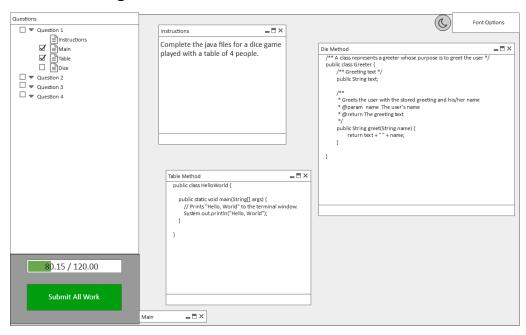
5. "Nito" – Examinee Interface

5.1 Examinee Screen

The examinee is expected to enter their Exam ID and Passcode and select the IP of an admin, which will then allow that admin to supervise them during the exam.
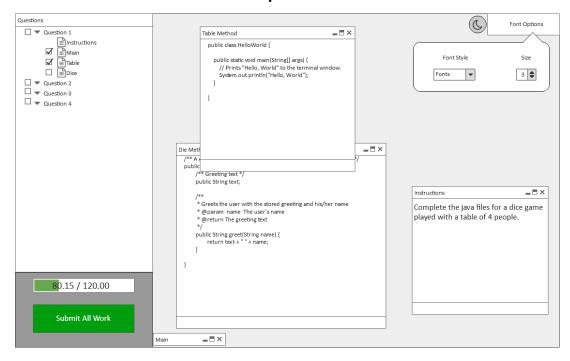
5.1.1 During Exam

In the Examinee Screen, examinees are displayed with a Task Pane and Main Screen. In the Task Pane, questions and its sub-parts are displayed. In the Main Screen there is actual implementation of your solution to be written on simple editor screens for solutions of each parts in the question. Also, each solution screen can be minimized which then minimizes to the bottom left of the Main screen and each successive minimized solution accumulates in the bottom pane. The solutions are saved automatically until the last change made in the solution screens. As the examinee's code is checked through for each method, the total progress is calculated and shown in a progress bar above the "Submit all your work" button. There is also a small "instructions" screen in the Main Screen, where the instructions are provided by the Instructor. In addition, there is an option in the Main Screen

to select Dark Mode (The "Moon" shaped icon), which allows the examinee to write the code in dark environment as most people prefer aesthetic in terms of contrast.
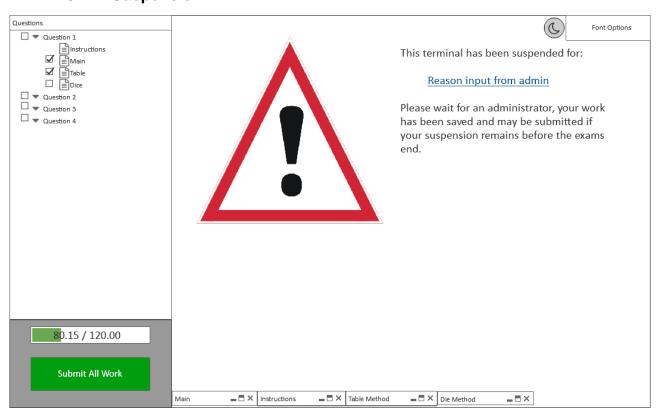
5.1.2 Examinee Font Screen Options

In addition, the examinee can also select a variety of fonts from "Font Options". Whilst searching for the font, the examinee can also choose the size of the font.
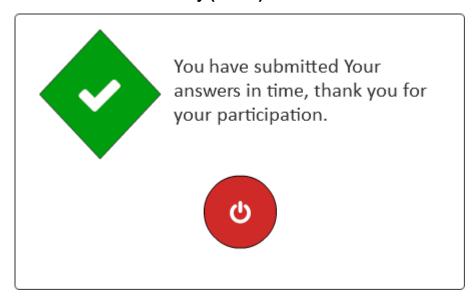
5.2 Suspension and Submission
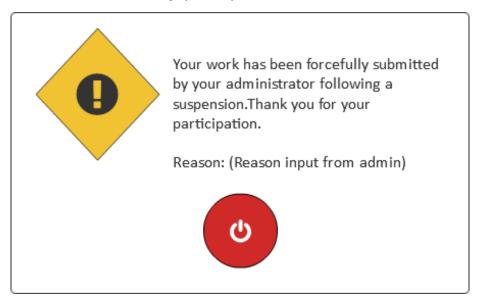
5.2.1 Suspension

If an examinee is caught doing any suspicious actions by the examiner, then the examinee's screen is blocked, and he/she are shown the view above. Where the reason for their suspension regarding their course of actions is included in "Reason input from admin". In this suspended view, the examinee is unable to control or do anything in the suspended time period as the examinee's progress halts.

5.2.2 Exam ends successfully (End 1)

When the examinee chooses to submit all their work within the exam time period, the image shown above is displayed. In this image the examinee is told they have submitted their answers in time, and then the examinee has the option of exiting if they click the "Power button".
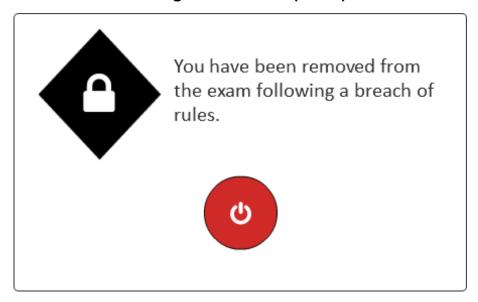
5.2.3 Exam ends forcefully (End 2)

If the examinee fails to submit their work on time, then the admin can forcefully end their work in progress and submit the latest work of the examinee. In this situation, there are two possibilities, first if the examinee is unable to complete their work on time, then the examinee is shown this screen but with the "Reason:" stating that the examinee failed to complete on time, so their work was automatically submitted. On the other hand, if the examinee failed to submit their work because of being suspended by the administrator due to any suspicions that were aroused. Then the "Reason:" states

that the examinee was suspended because of any reason stated by the examiner and their latest work is submitted.

5.2.4 Exam ends in kicking the examinee (End 3)

When the examinee violates rules and regulations speculated by the examiner, the examinee is banned/kicked from the exam and is shown the view above. Following this view the examinee can talk with the examiner after the exam.

6. Summary

This report shows and explains graphical user interface of Nito software – the exam creation and conduction system. All user interfaces are created to be as simple as possible. However, assuming there are a lot of features, it may look complicated in the first glance, but it should be easy to learn using it. Many thanks to the application "Balsamiq Mockups 3" for providing us with easy-to-use mockuping software.