Oculus

(E-Malpractice Prevention Tool)

A PROJECT REPORT

Submitted for the course: Human Computer Interaction (CSE4015)

By

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Slot: A2+TA2

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(SCHOOL OF COMPUTER SCIENCE AND ENGINEERING)

VIT®

Vellore Institute of Technology

(Deemed to be University under section 3 of UGC Act, 1956)

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ACKNOWLEDGEMENTS

We take immense pleasure in thanking **Dr. G. Viswanathan**, our beloved Chancellor, VIT University and respected Dean, **Dr. R. Saravanan**, for having permitted us to carry out the project.

We express gratitude to our guide, **Prof. Shashank Mouli Satapathy**, for guidance and suggestions that helped us to complete the project on time. Words are inadequate to express our gratitude to the faculty and staff members who encouraged and supported us during the project. Finally, we would like to thank our ever-loving parents for their blessings and our friends for their timely help and support.

Signature of Students:

Ashwin Suresh Varma
Tris Marie Joe
Aadarsh Sreekumar

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1. Abstract

Educational institutions have evolved over the years, thanks to technological advancements. In the current scenario due to Pandemic, Educational institutions have turned to Internet based learning for maintaining the continuity of academics and so online learning has become the way for institutions to maintain the academics of the students.
Due to this, online learning has been faced with a new challenge that is online exams. Online examination is conducted on web-enabled devices like laptops and desktop computers. However there is a major concern that due to the absence of a proctor students may indulge in malpractice which undermines the point of the examination.

To combat this, Oculus brings in an eye tracking mechanism which monitors the student's eyes and notifies the examiner if the students gaze sways away from the screen for more than the time allowed by the examiner, thereby discouraging the student from committing malpractice.
It also incorporates a built-in Quiz Platform that will help both the faculties and institutes in conducting their initial phase of examinations.

2. Introduction

In the current scenario due to Pandemic, Educational institutions have turned to Internet based learning for maintaining the continuity of academics and so online learning has become the way for institutions to maintain the academics of the students.

While many schools like the security provided by live proctors, the decision is not that simple—student experience continues to be key to program success, and live proctoring makes students uncomfortable. They have a harder time concentrating on their exam because they're aware of a proctor watching them (and may even see that proctor via webcam in the corner of their screen).

- Divided Attention: In many live proctoring scenarios, a single proctor monitors several students at a time.
- Inconvenient Scheduling: Live proctoring requires exactly that — someone who can proctor a student's exam live.
- Student Self-Consciousness: There's one final drawback to live proctoring, and that is the student experience. Often, when students have a sense that they are being watched, they don't perform as well on assessments.
- Open-Book Exams: More often than not, the format of online exams is perceived, to some extent, like an open book.
- Infrastructural Limitations: Many factors influence the user experience around the globe, such as poor internet connectivity, power shortage, and other infrastructural issues.

Problem Statement:

To create a system that uses the eye tracking mechanism which monitors the student's eyes and notifies the examiner when and if the student gaze sways away from the screen for more than a particular time thereby discouraging the student from committing malpractice. We aim to develop a system that combat malpractice during exams so as to have a fair examination for all students. We aim to create a website that can be used for online quizzes and examinations and which is easily accessible to both students as well as teachers.

3. Background / Related Work

Software Solutions:

1. Mercer | Mettl

Mercer|Mettl's suite of anti-cheating technologies enables a secure and fair test-taking experience for the high-stake exams. With a base of more than 4000 clients, Mercer | Mettl has conducted over 12 million proctored assessments in a year so far in 150+ universities across the globe. Also offering comprehensive assessment solutions, Mettl's range of functions competency, online as well as remote proctoring, results in analytics, and payment gateway for users to conveniently pay exam fees.

Features

- Candidate tracking
- Self-service portal
- Workflow management
- Reference checking
- Options between AI-based proctoring and manual remote proctoring
- 3-point candidate authentication
- Image recognition, mobile phone prevention

2. Examus

Examus is one of the most cost-effective and flexible online proctoring services. It has an algorithm that helps analyze online user behavior. The tool has a tech stack that uses a webcam for facial recognition and emotion detection. It is ideal for users who do not wish to share their data. The list of Examus products includes proctoring service tools, consumer video analytics software, and user engagement and attention video recognition API. Moreover, Examus is supported by big names like Microsoft, Berkeley Skydeck, and American Councils EdTech Accelerator.

Features

- Provides mobile and computer support
- Simple API
- Cutting-edge video recognition
- AI-based real-time monitoring

3. ProctorU

ProctorU provides three kinds of online remote proctoring services that offer exemplary functionalities such as auto proctoring and live proctoring. It is a preferred choice among many academic institutes and deals with proctoring of examinations through an AI-based system. Catering to the needs of around 1000 customers, this online proctoring software facilitates ID authentication and has a per-day proctoring capacity of conducting more than 10,000 exams.

Features

- Session launch with a live proctor
- Dedicated account team for assistance
- Multi-factor identity verification via a live proctor
- Schedule or on-demand access 24/7
- AI-based behavior analysis

Existing Research Papers:

4. Massive Open Online Proctor

Reference: Li, Xuanchong & Chang, Kai-min & Yuan, Yueran & Hauptmann, Alexander. (2015). Massive Open Online Proctor. 1129-1137. 10.1145/2675133.2675245.
Massive Open Online Courses (MOOCs) enable everyone to receive high-quality education. However, current MOOC creators cannot provide an effective. The MOOP framework consists of three major components: Automatic Cheating Detector (ACD), Peer Cheating Detector (PCD), and Final Review Committee (FRC). ACD uses webcam video or other sensors to monitor students and automatically flag suspected cheating behavior. Ambiguous cases are then sent to the PCD, where student's peer-review flagged webcam video to confirm suspicious cheating behaviors. Finally, the list of suspicious cheating behaviors is sent to the FRC to make the final punishing decision.

5. Online Proctored Exams: Where And How Are They Used? Basics, Practical Scenarios And Technical Solutions For Online Proctoring At European Universities And Educational Institutions

Reference: Baume, Matthias. (2019). ONLINE PROCTORED EXAMS: WHERE AND HOW ARE THEY USED? BASICS, PRACTICAL SCENARIOS AND TECHNICAL SOLUTIONS FOR ONLINE PROCTORING AT EUROPEAN UNIVERSITIES AND EDUCATIONAL INSTITUTIONS. 5216-5225. 10.21125/inted.2019.1301.

6. Heuristic-Based Automatic Online Proctoring System

Reference: Raj, R.S. & Narayanan, Athi & Bijlani, Kamal. (2015). Heuristic-Based Automatic Online Proctoring System. 458-459. 10.1109/ICALT.2015.127.

7. Dependable distributed testing: Can the online proctor be reliably computerized?

Reference: Frank, Ariel. (2010). Dependable distributed testing: Can the online proctor be reliably computerized?. ICE-B 2010 - Proceedings of the International Conference on e-Business. 1 - 10.
Distributed Education (DE) enables education, both teaching and learning, anytime, anywhere, using any media or modality, at any pace. Assessment, especially testing, is a major component in the overall evaluation of an educational program. However, there still is an important component missing from most DE programs to enable its full realization in a distributed environment: dependable distributed testing (DDT). The paper presents a comprehensive risk analysis of dependable distributed testing that classifies seven (types of) risks, introduces the resultant DoDoT (Dependable observable Distributed online Testing) reference model, and examines its coverage by three commercial systems. However, these systems are not yet in use in most DE frameworks and do not have yet full DoDoT coverage. The vision of the DoDoT reference model is the continued pursuit and adaptation of new, innovative technologies and methods to make dependable distributed testing increasingly more computerized, reliable, affordable and prevalent.

4. Real-life Applicability

This system can be used by organizations be it schools, colleges or startups to create and take quizzes online. Our system has the webcam enabled feature without which the user will not be able to take the quiz.

Our system quiz platform provides the faculty to create a quiz, remove a quiz, and enable a quiz as well as to monitor a quiz. For a new quiz the faculty is able to create any number of question with four multiple choice. They are also able to set a timer to the quiz. The faculty can also remove a quiz. After a quiz creation the faculty has to enable the quiz for it to be visible on the students landing page such that the student can access the quiz. While the student is accessing the quiz if they look away from the laptop screen for more than 5 second an alert is sent to the student and to the faculty who can while monitoring the quiz see who has looked away from the camera at what time etc. which is displayed in a table format which the faculty can make a note of. The faculty also has the option of leaderboard to see which position their students lie in. The faculty also has an option to see all the students that have created an account and their main details such as name, registration number and email address is displayed.

On the student's landing page the student gets a set of general instructions for accessing quiz underneath all the quizzes that are available to them. They can also see all the quizzes that they have taken using the My History option. Once starting the quiz the student can choose an option and then has to lock it for it to be saved. They can also reset the option that they chose and then choose another option and then lock it to be saved. At the end they can press submit test to complete the quiz. After which the total marks will be displayed. The student can also then access the quiz details to find the complete breakdown of their marks for the particular quiz.

All the options helps both the student and faculty to take a fair quiz such that it is fair to all the students and it is easier for the faculty to monitor the quiz and to see who all have looked away even though this isn't manual proctoring.

5. Individual Contribution

Aadarsh Sreekumar

- Reset password link
- Faculty and Student home page
- Implementation of quiz system
- Student view results

Ashwin Suresh Varma

- Webcam compatibility
- Student quiz attempting time with face detection
- Quiz monitoring with Ajax implementation
- Documentation

Tris Marie Joe

- Landing page of website(Login part)
- Signup page
- Documentation

6. Tools and Technologies used / Hardware – Software

Requirements

Software/Tools/Libraries:

- XAMMP Server
- Visual Studio Code
- HTML
- CSS
- JavaScript
- AJAX
- PHP
- Bootstrap Framework
- MySQL
- Pico.js
- Alertify.js
- Particles.js
- *WebGazer.js*

Hardware Requirements:

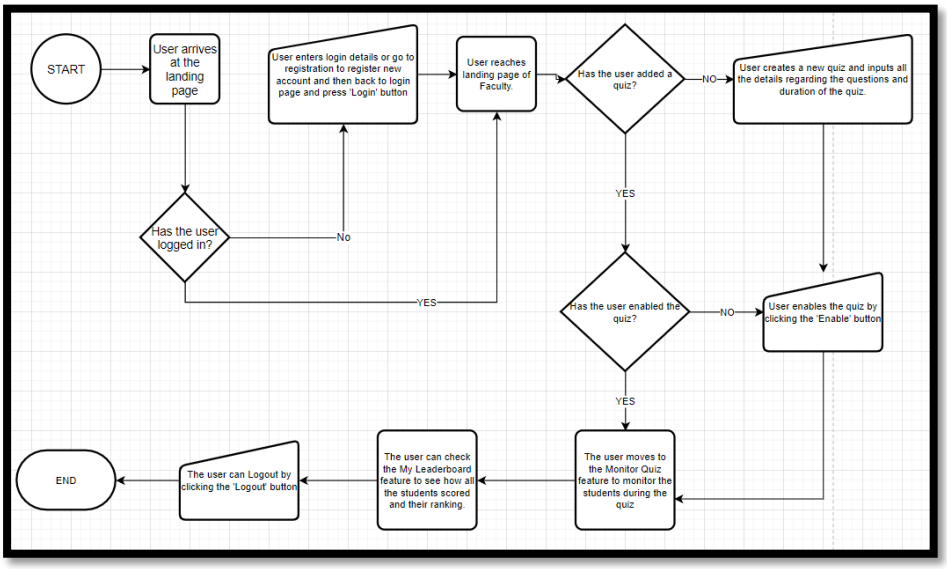
- Minimum 2 GB RAM
- Minimum 1 GB Internal Space
- Working Webcam
- Minimum 1 Mbps Internet Speed

Highlighted Technology:

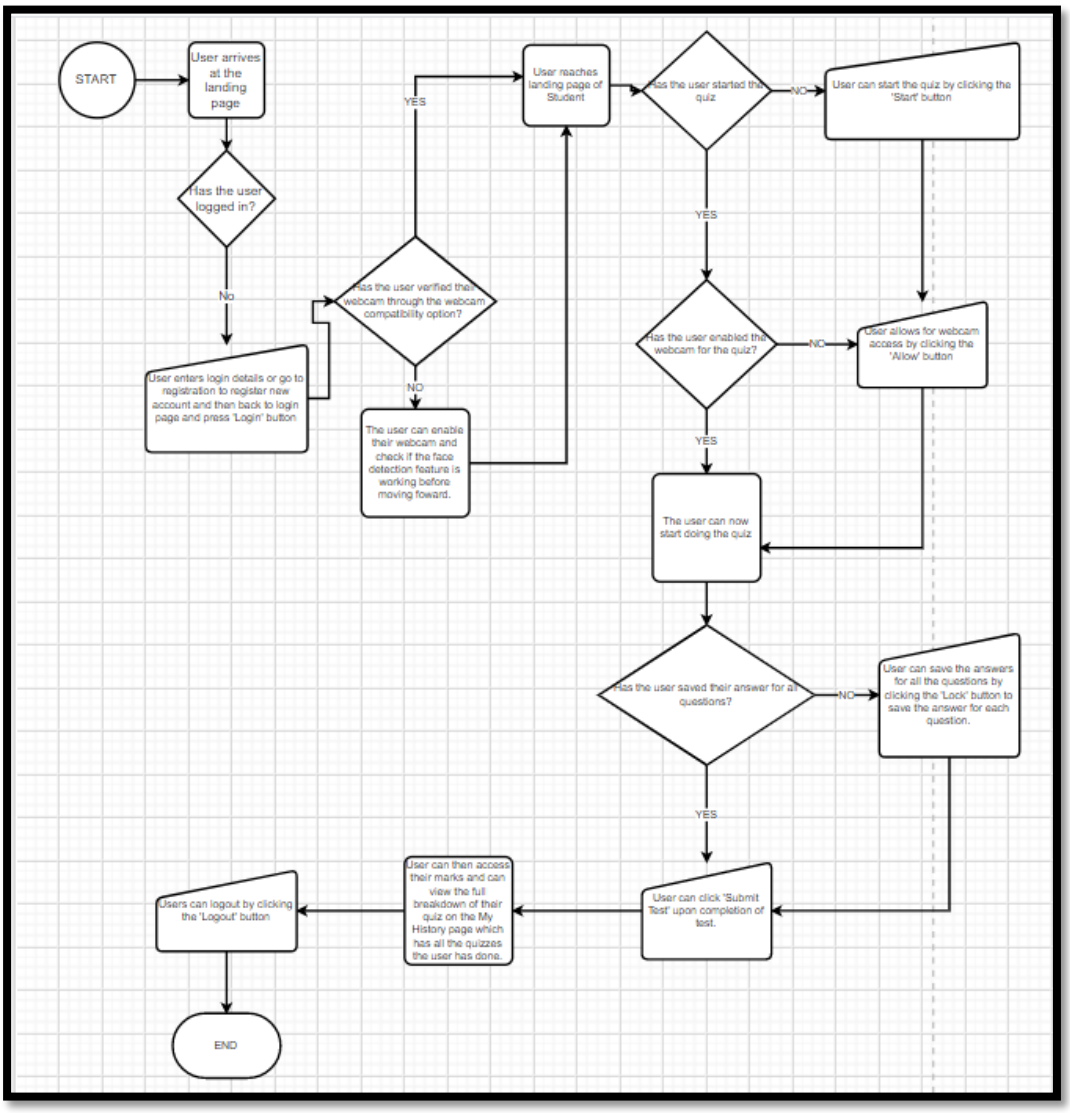
- Face Detection

7. Proposed System Process Flow

Faculty User:



Student Login:



8. Working Methodology

a. User Registration

The landing page of our website will have our logo of the website at the left hand corner.
Faculty: For the faculty login a pop up box is displayed upon clicking the faculty login button on our website for the faculty to input their username and password. The faculty can also register with entering their details i.e., full name, email id, username, and password and confirm password from the faculty signup button on the bottom of the student signup page.
Student: The student can simply login with their username and password. The student can also register with entering their details i.e., full name, registration number, email id, username, and password and confirm password from the student registration button on the login page.
At the login page there is also another feature to reset password. Upon clicking this feature, the student has to enter their username and with which an email id will be sent to the user with the reset password code with which upon using it the student is able to reset their password.

b. Quiz-Maker (Faculty)

- **Making a New Quiz:**
  To make a new quiz the faculty has to click the option on the faculty home page. Upon reaching the making quiz page, the faculty has to enter the quiz title, the number of questions, the marks for per correct question, the minus marks if needed for wrong answer and the time limit of the quiz. The faculty then has to click the submit button to move on to the next page for the quiz-maker.
- **Adding Questions**:
  According to the number of questions, the faculty now has to input the question and the multiple choice options for each question and then choose the input in which the right answer to the question is displayed. After doing this for all the questions, the faculty then has to click the submit button for the quiz to be successfully saved.
- **Enable/Disable:**
  Once the quiz is set, its default option is Disable which means that the quiz is not yet accessible by the students. The faculty has to enable the quiz after which the student will be able to access the quiz and answer it. If the time is over for all the students to take the quiz the faculty can then disable it such that latecomers won't be able to take the quiz.
- **Remove Quiz:**
  The faculty is able to delete a quiz if they have made a mistake by clicking the remove quiz button which automatically deletes the quiz.
- **Monitor Quiz:**
  When the quiz is enabled, and the students starts taking the test. The faculty can click this option with which he gets a table that is updated every few seconds. If on the student's side, they do a malpractice where they look away from the screen, an alert is sent to the student and also to the faculty which is displayed in this feature in a table with the student details and the time at which they looked away from the screen.

c. Attempt Quiz (Student)

Once the student clicks the start button on the particular quiz he/she has to attend they are taken to the quiz page.

- **Face Detection:**
  The webcam automatically starts once the quiz begins and this is displayed on the right side of the quiz so that the student will be able to see if the webcam has captured their face. If the student does any malpractice wherein the student is looking away from the screen a timer is displayed which upon end of timer an alert box is enabled to warn the student that they have looked away from the screen.
- **Mark Answer:**
  The student is able to choose any of the four options displayed that they think is the right answer for the particular question displayed.
- **Lock and Reset:**
  This option is made such that once a student clicks a particular option he/she is able to lock (save) the particular option which is then saved as the particular answer for the question. If after locking it they wish to change the answer, the reset button is used which resets the question so the student can answer it again.
- **Submit:**
  At the top of the quiz the time countdown for the quiz is displayed so that the user can see how much time they have remaining for the quiz. Next to the timer is the submit button which the user can click upon finishing the quiz. If the user accidently presses the submit button an alert box is given to make sure that the user actually wants to submit the quiz.

d. Result

- **Statistics**:
  Since the quiz is auto-corrected at the beginning the student is able to view their marks as soon as they finish the quiz. They will be able to see in a table format the quiz name, the number of questions, the number of right answers, the number of wrong answers, the number of unattempted questions and their score. If the user wants to fully analyse their quiz a view results button is showed.
- **Analysis:**
  In this module the student is able to analyse how they did in the quiz. They will be able to see all the questions displayed with the correct answer and the answer that they have chosen and the calculation of marks.

e. Leaderboard

This module is in the faculty dashboard wherein the faculty is able to see the students and their rank according to the marks that they have got in a quiz. The leaderboard is displayed in a table format with the columns describing the student name, registration number, the username and their score.

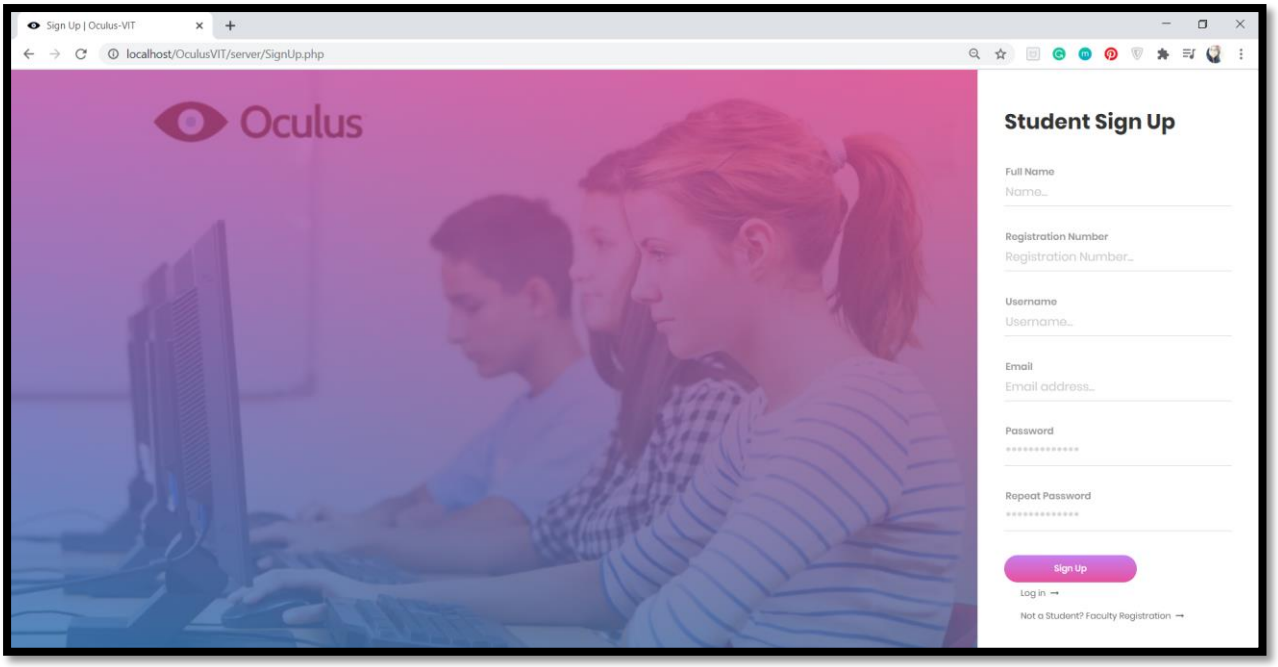
f. Webcam Compatibilty

This module is a safety mechanism for the students so that they can test if their webcam is compatible with the software and to cross check if they have enough lighting to allow for accurate face detection. It also helps them to get accustomed to the whole platform. This module has a FAQ page and a Guidelines page so that the students can refer to those before attempting the test.

9. Implementation Results and User Interfaces

a. Student & Faculty Registration and Login:

i. Student registration:



ii. Faculty registration:

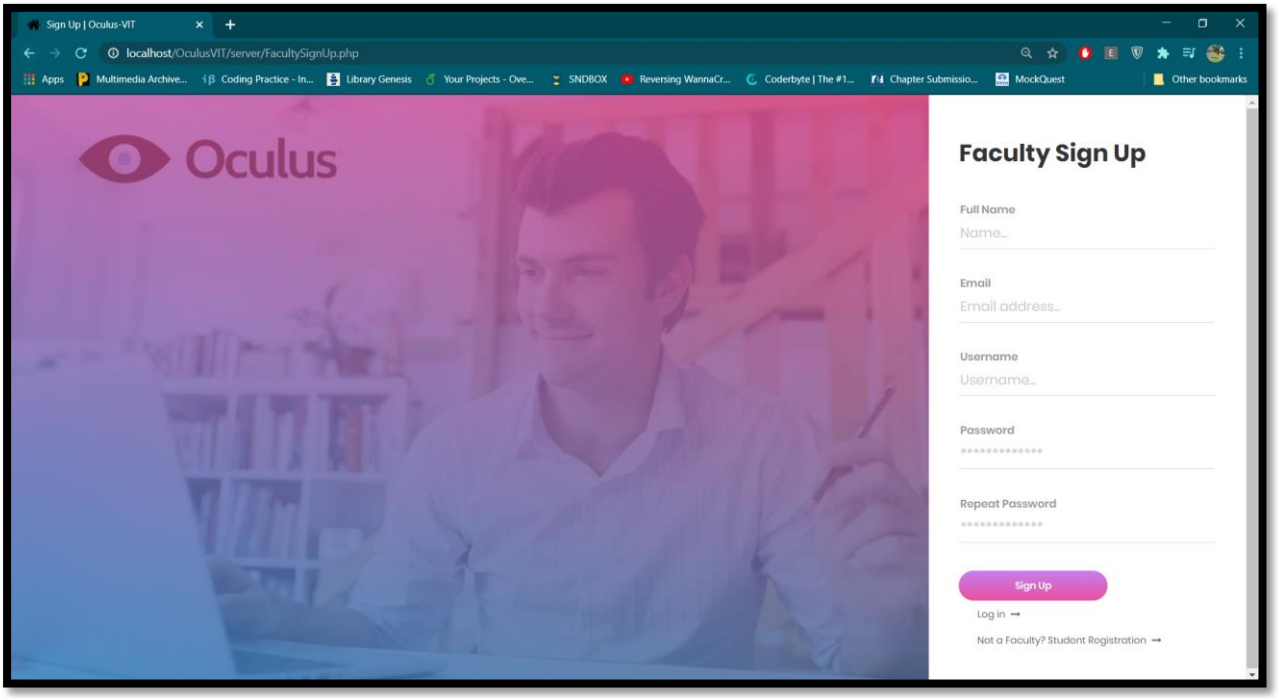
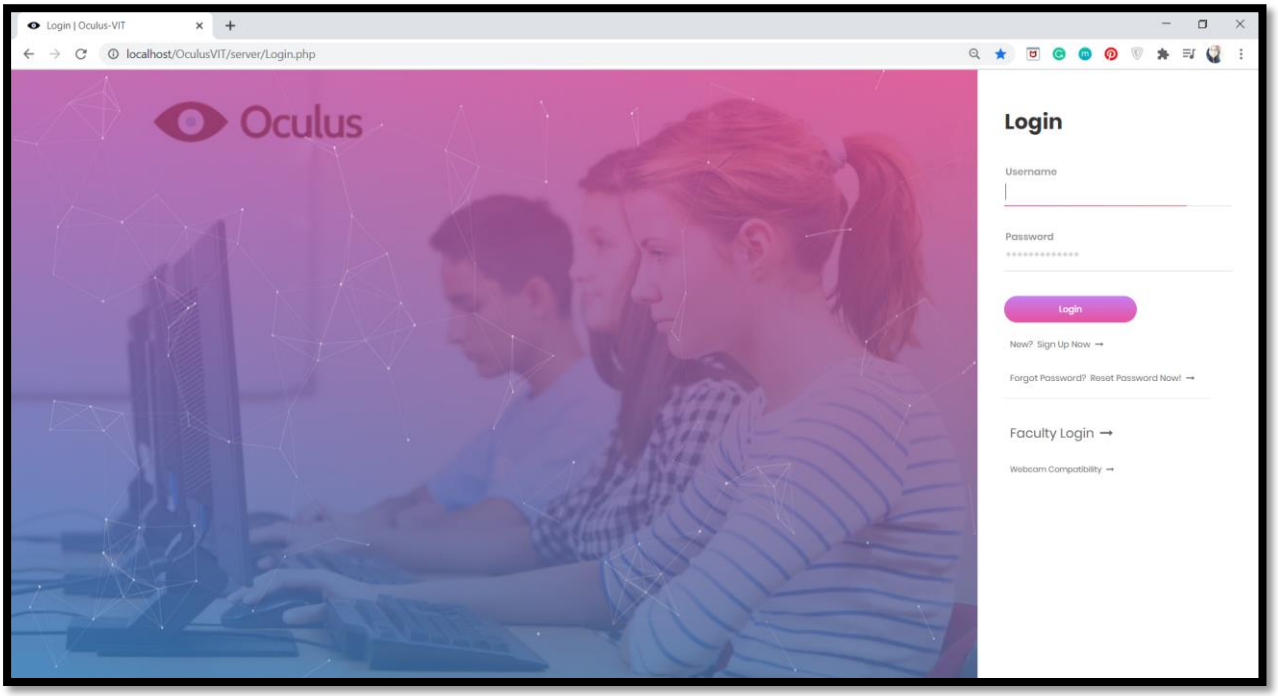


Fig. 7.1: The images shows the Student and Faculty registration form accessed from site's home page. The user fills up the form to register with the website.

iii. Student login:



iv. Faculty login:

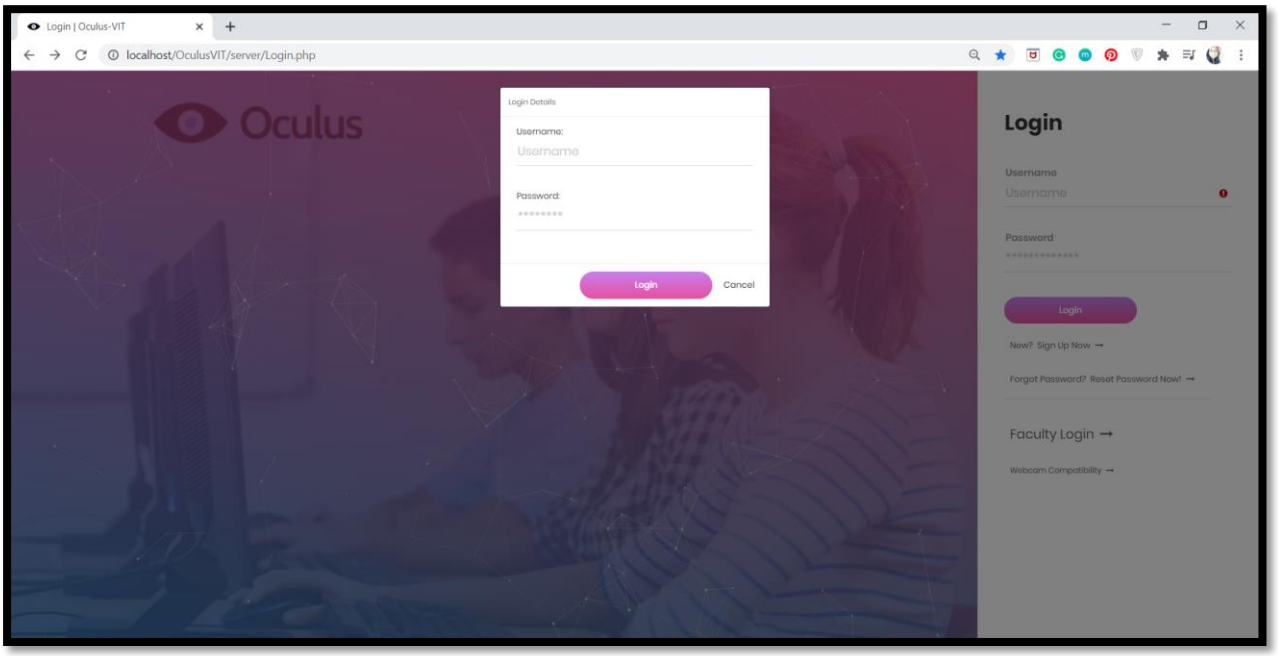
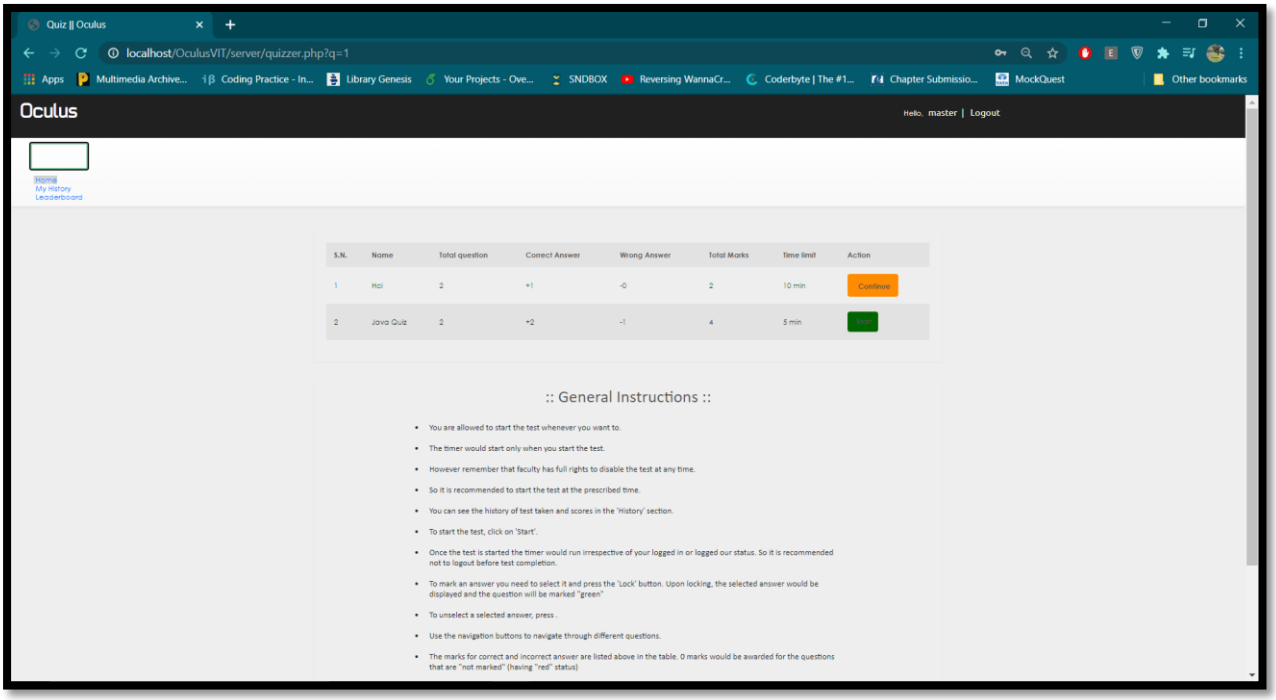


Fig. 7.2: Student and Faculty login form as viewed from the site's home page. After registration user can login through this form.

v. User Home Page:

Fig. 7.3: The two images are showing the user home page after logged in.

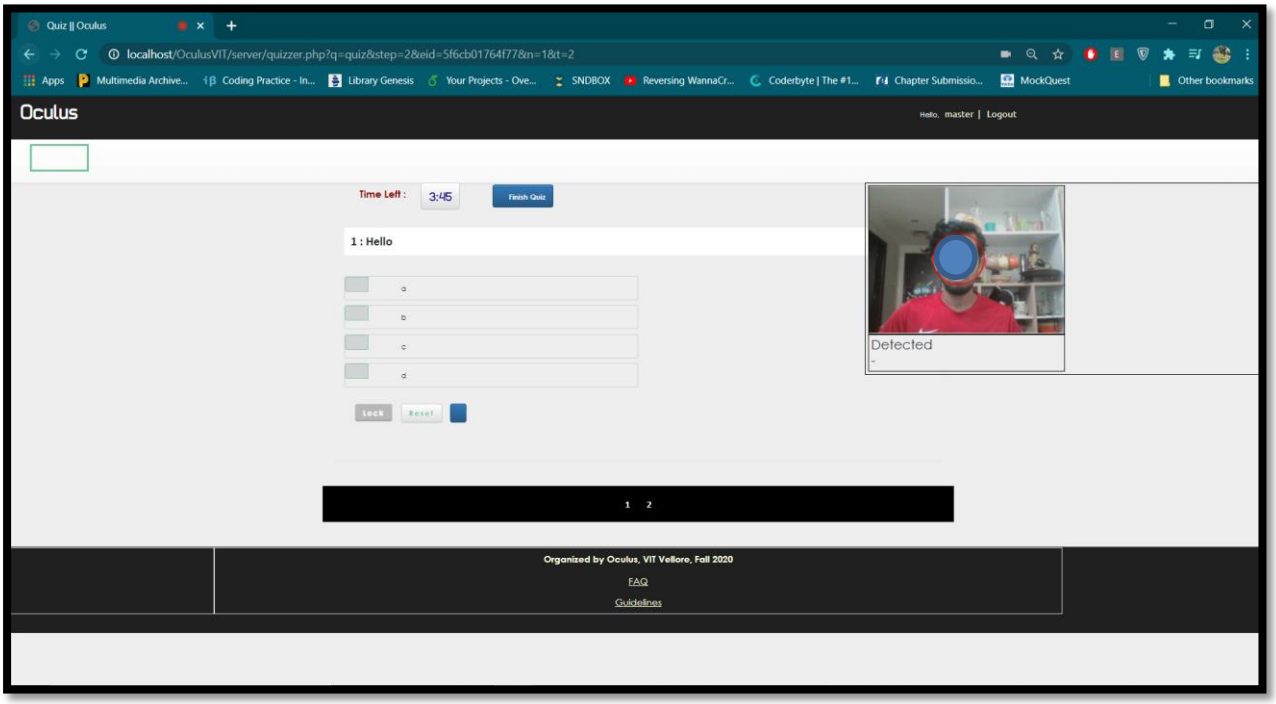


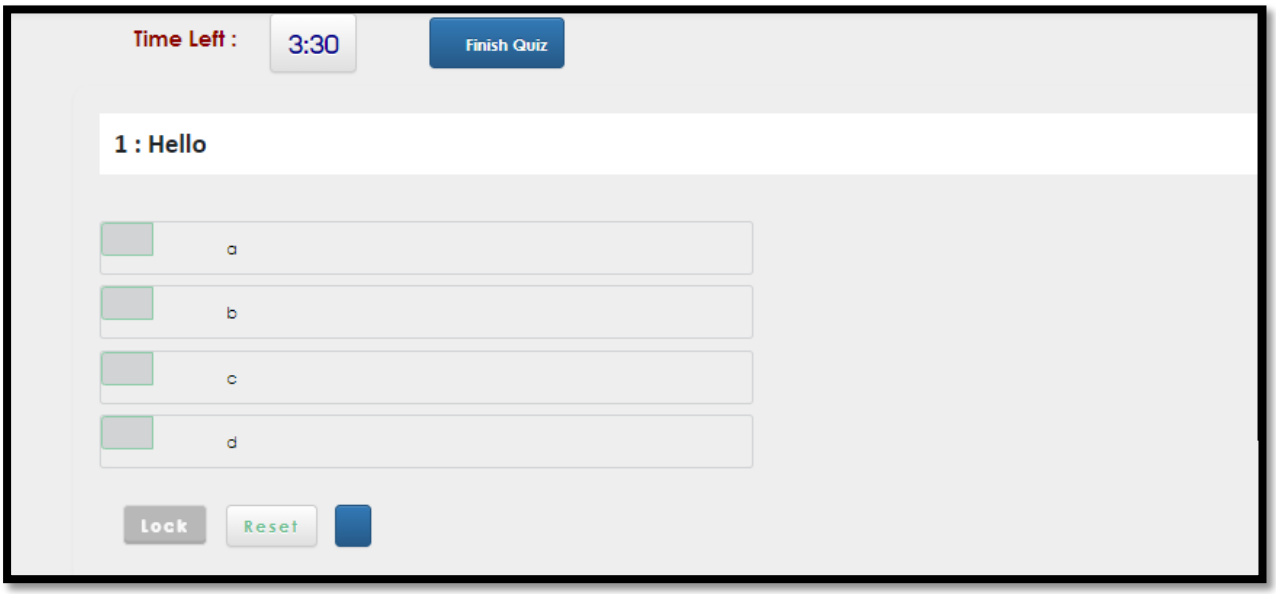
S.N.	Name	Total question	Correct Answer	Wrong Answer	Total Marks	Time limit	Action
1	Hci	2	+1	-0	2	10 min	Continue
2	Java Quiz	2	+2	-1	4	5 min	Start

:: General Instructions ::

- You are allowed to start the test whenever you want to.
- The timer would start only when you start the test.
- However remember that faculty has full rights to disable the test at any time.
- So it is recommended to start the test at the prescribed time.
- You can see the history of test taken and scores in the 'History' section.
- To start the test, click on 'Start'.
- Once the test is started the timer would run irrespective of your logged in or logged our status. So it is recommended not to logout before test completion.
- To mark an answer you need to select it and press the 'Lock' button. Upon locking, the selected answer would be displayed and the question will be marked "green"
- To unselect a selected answer, press .
- Use the navigation buttons to navigate through different questions.
- The marks for correct and incorrect answer are listed above in the table. 0 marks would be awarded for the questions that are "not marked" (having "red" status)

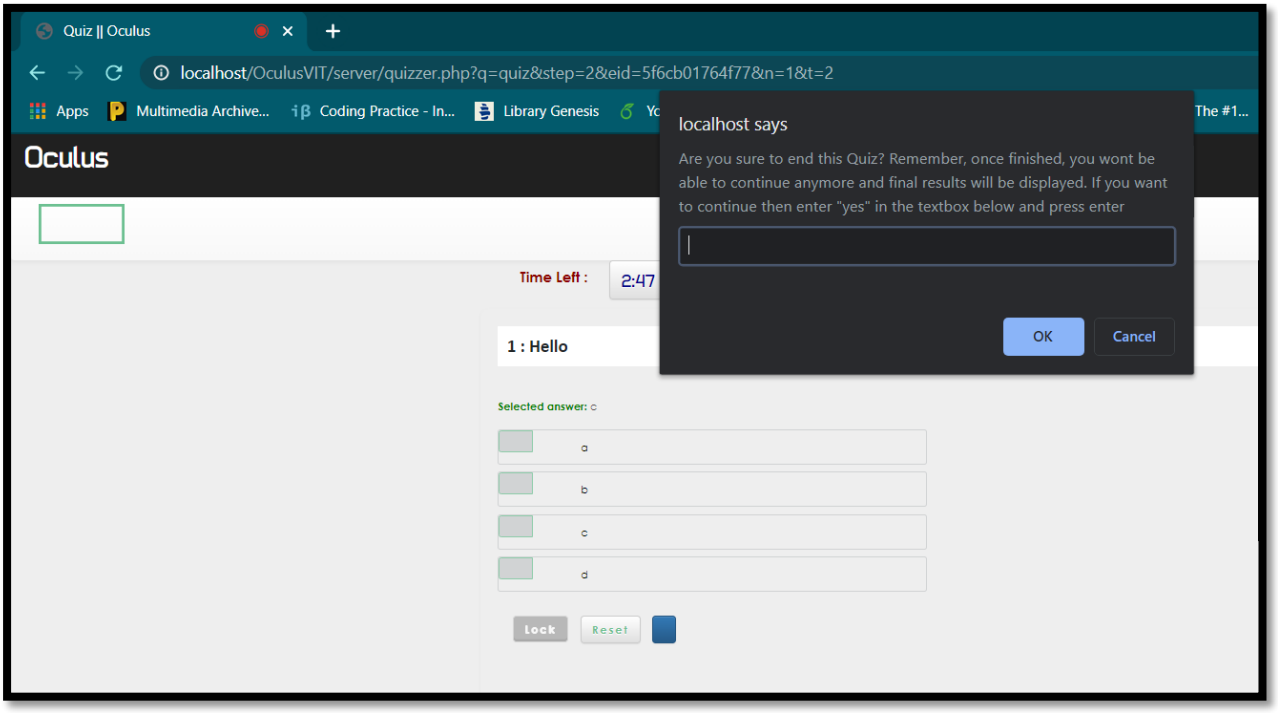
b. Attempting the Quiz





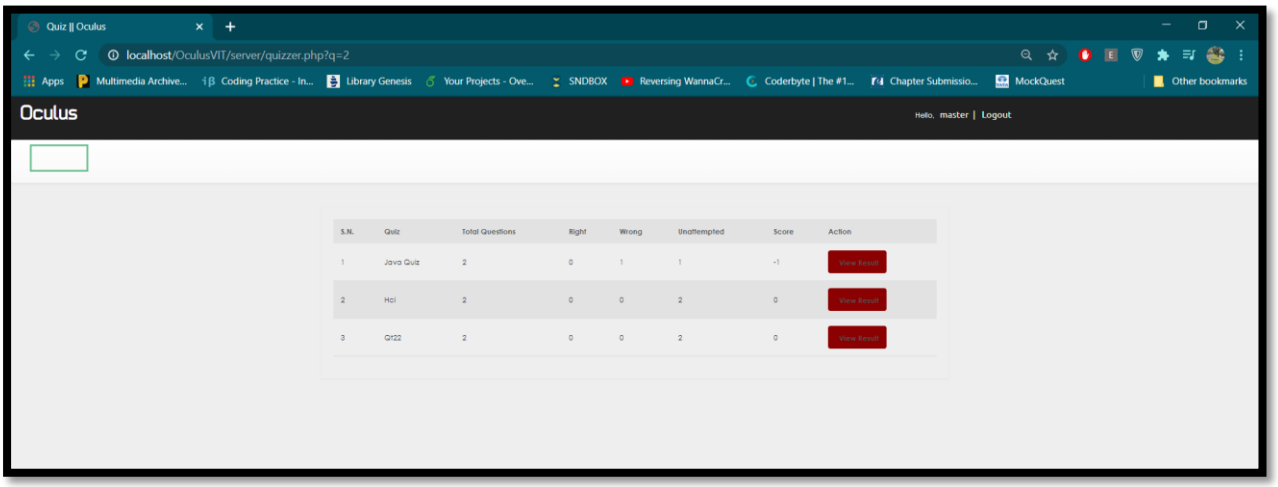
Selecting an answer

After Clicking Submit



i. History

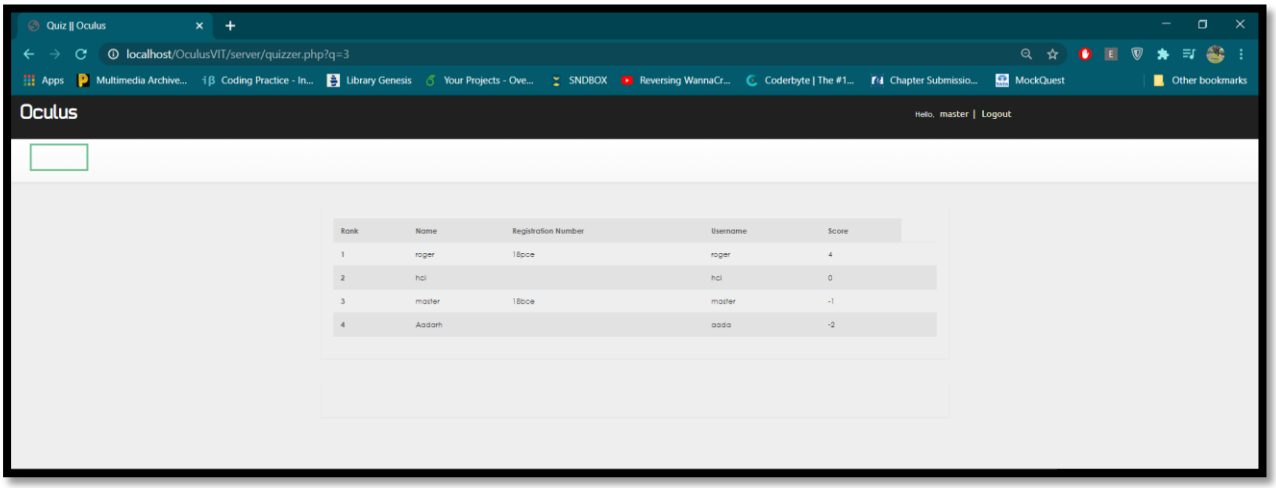
Fig 7.4. Shows the history of all the quizzes attempted



S.N.	Quiz	Total Questions	Right	Wrong	Unattempted	Score	Action
1	Java Quiz	2	0	1	1	-1	View Result
2	Hci	2	0	0	2	0	View Result
3	Qt22	2	0	0	2	0	View Result

ii. Leaderboard

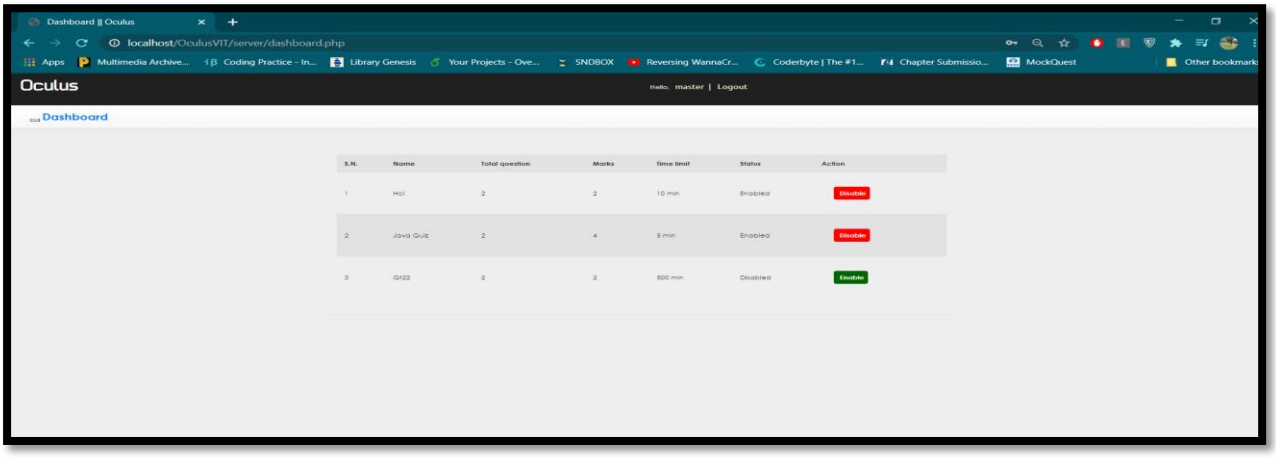
Fig. 7.5: The image shows the leaderboard of all the students who have attempted the Quiz.



Rank	Name	Registration Number	Username	Score
1	roger	18pce	roger	4
2	hci		hci	0
3	master	18bce	master	-1
4	Aadarh		aada	-2

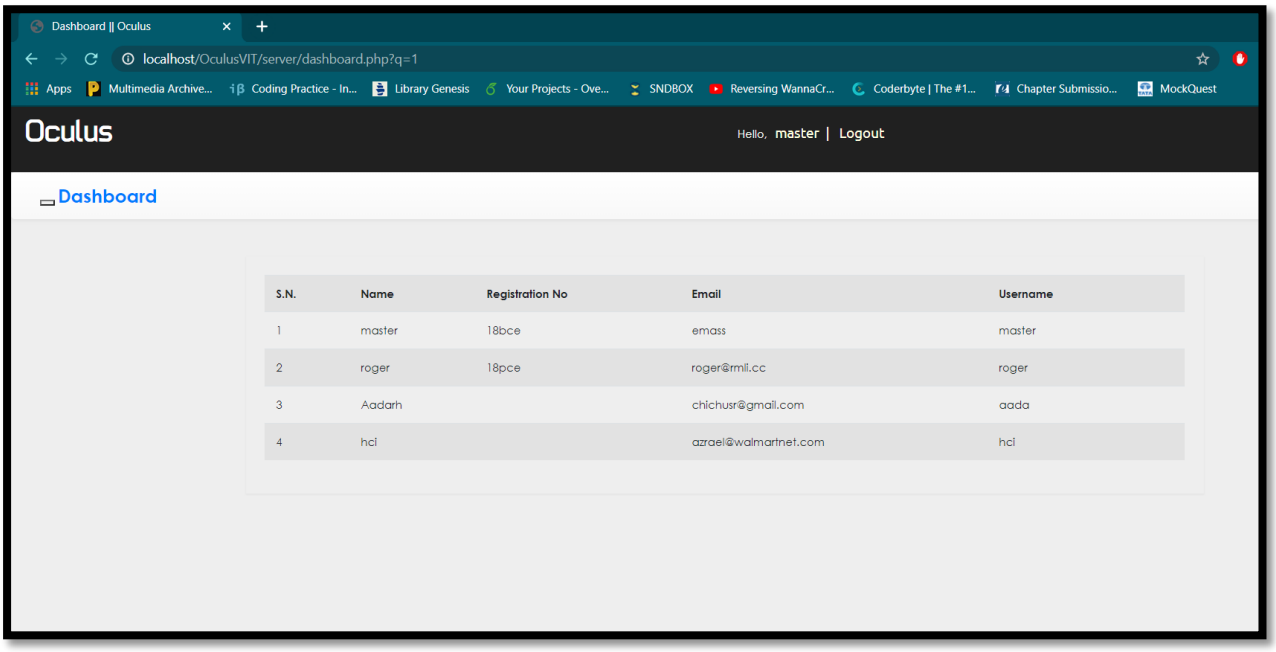
c. Faculty Home Page

Fig. 7.6: The user home page showing the NGO search module view using search form.

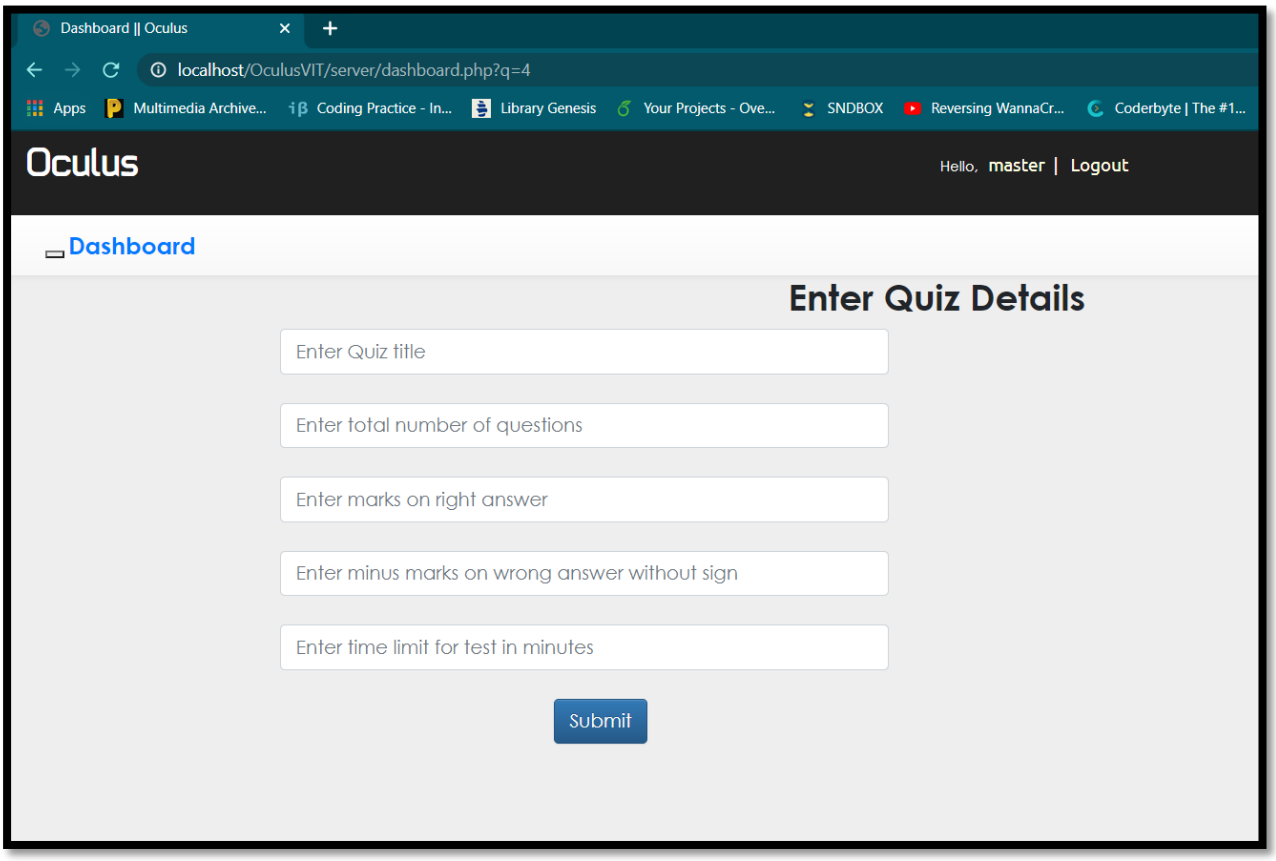


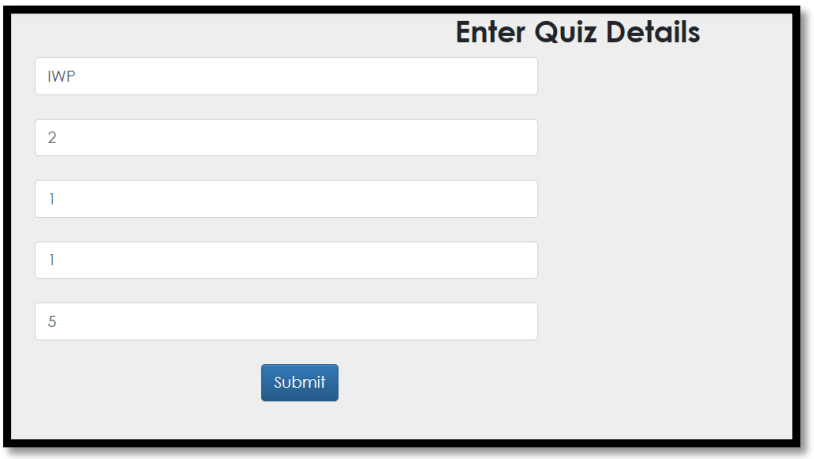
S.N.	Name	Total question	Marks	Time limit	Status	Action
1	Hci	2	2	10 min	Enabled	Disable
2	Java Quiz	2	4	5 min	Enabled	Disable
3	Qt22	2	2	500 min	Disabled	Enable

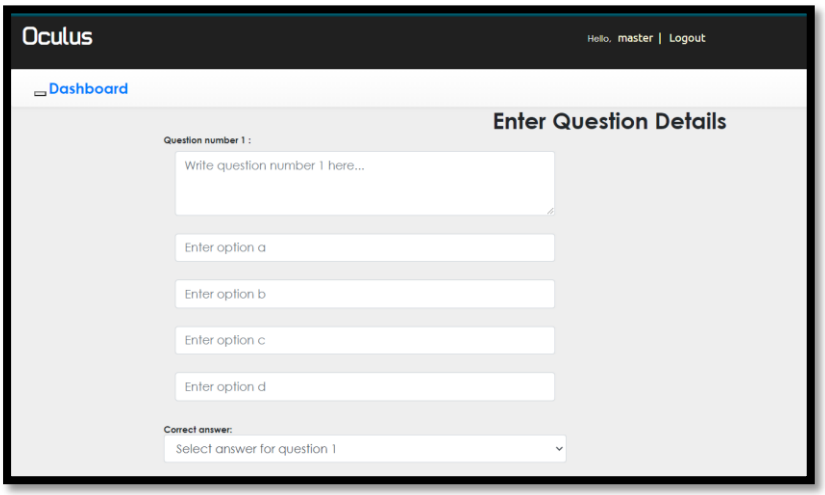
Users:

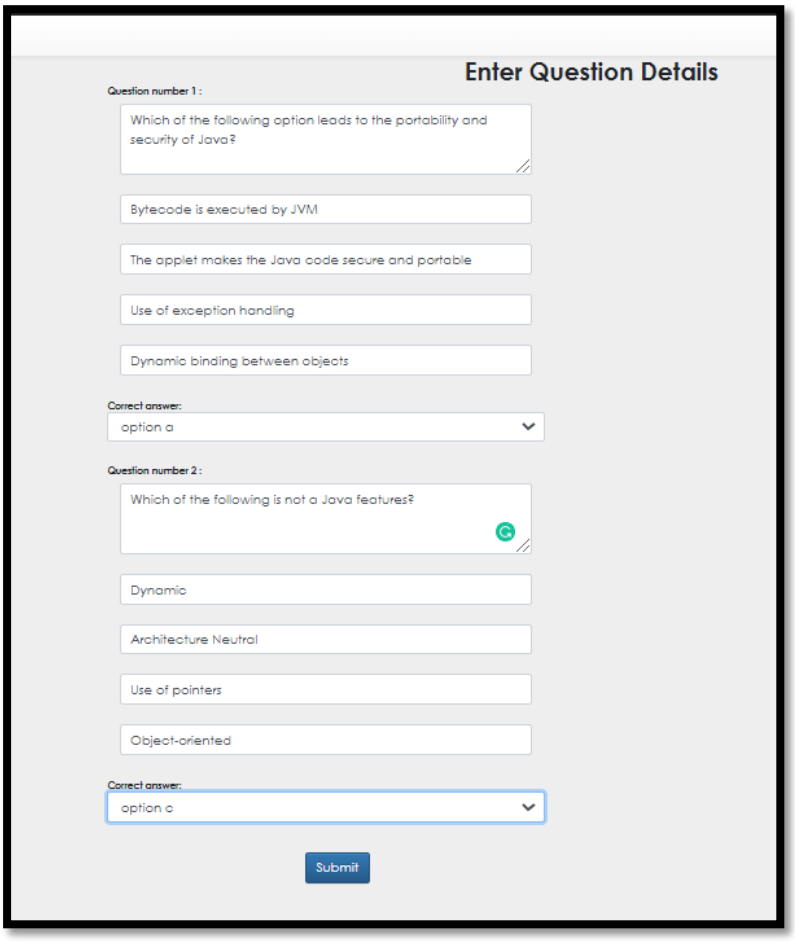


Adding a Quiz:

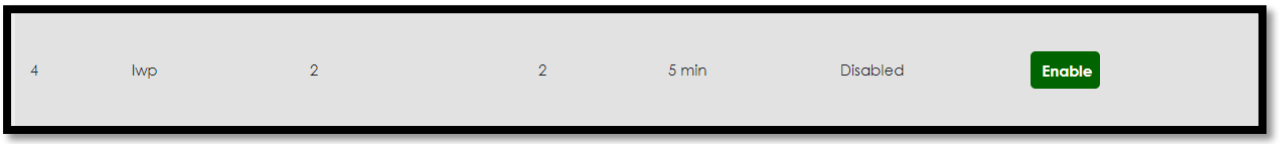



Enter Quiz Details
IWP
2
1
1
5
Submit


Oculus
Hello, master | Logout
Dashboard
Enter Question Details
Question number 1 :
Write question number 1 here...
Enter option a
Enter option b
Enter option c
Enter option d
Correct answer:
Select answer for question 1

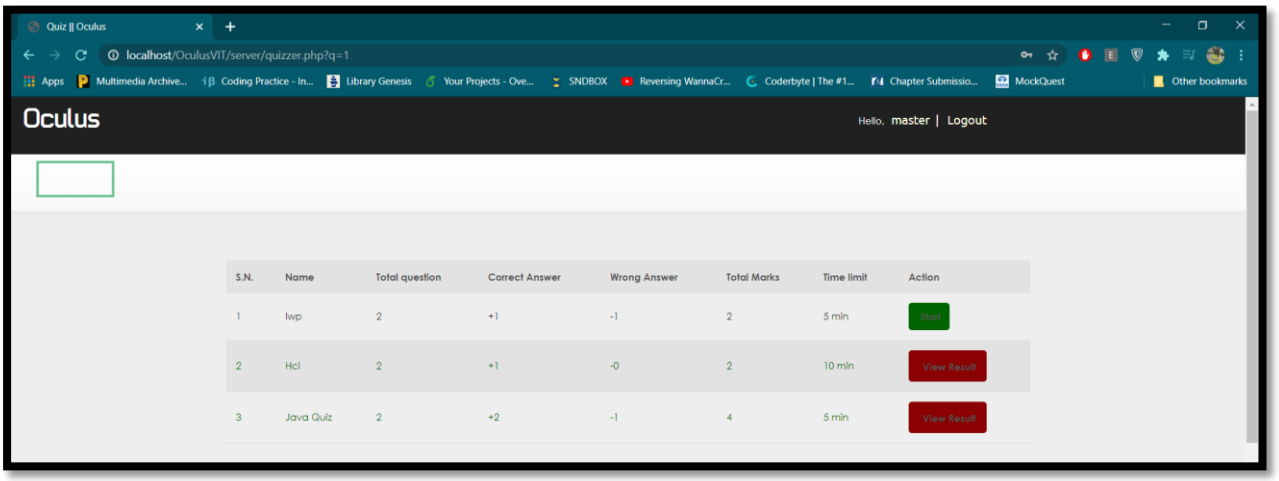

Enter Question Details
Question number 1 :
Which of the following option leads to the portability and security of Java?
Bytecode is executed by JVM
The applet makes the Java code secure and portable
Use of exception handling
Dynamic binding between objects
Correct answer:
option a
Question number 2 :
Which of the following is not a Java features?
Dynamic
Architecture Neutral
Use of pointers
Object-oriented
Correct answer:
option c
Submit

After clicking Submit



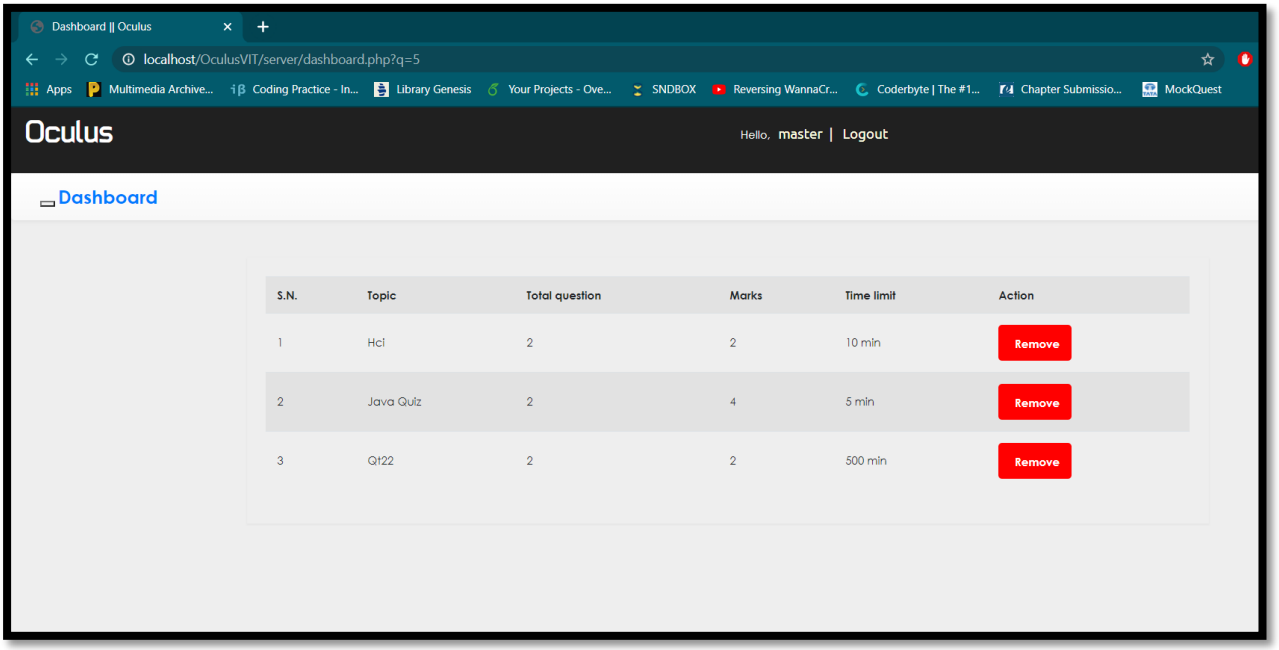
4	lwp	2	2	5 min	Disabled	Enable

At the User End after clicking Submit:



S.N.	Name	Total question	Correct Answer	Wrong Answer	Total Marks	Time limit	Action
1	lwp	2	+1	-1	2	5 min	Start
2	Hcl	2	+1	-0	2	10 min	View Result
3	Java Quiz	2	+2	-1	4	5 min	View Result

Remove a Quiz:



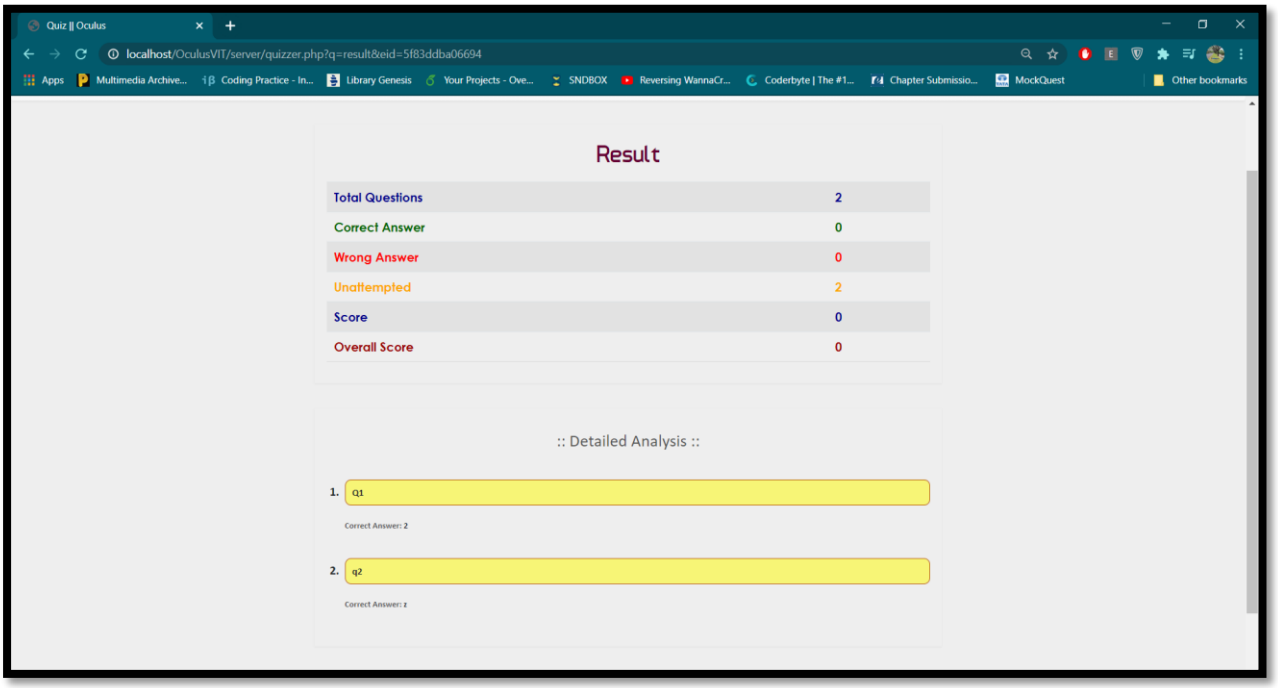
S.N.	Topic	Total question	Marks	Time limit	Action
1	Hcl	2	2	10 min	Remove
2	Java Quiz	2	4	5 min	Remove
3	Qt22	2	2	500 min	Remove

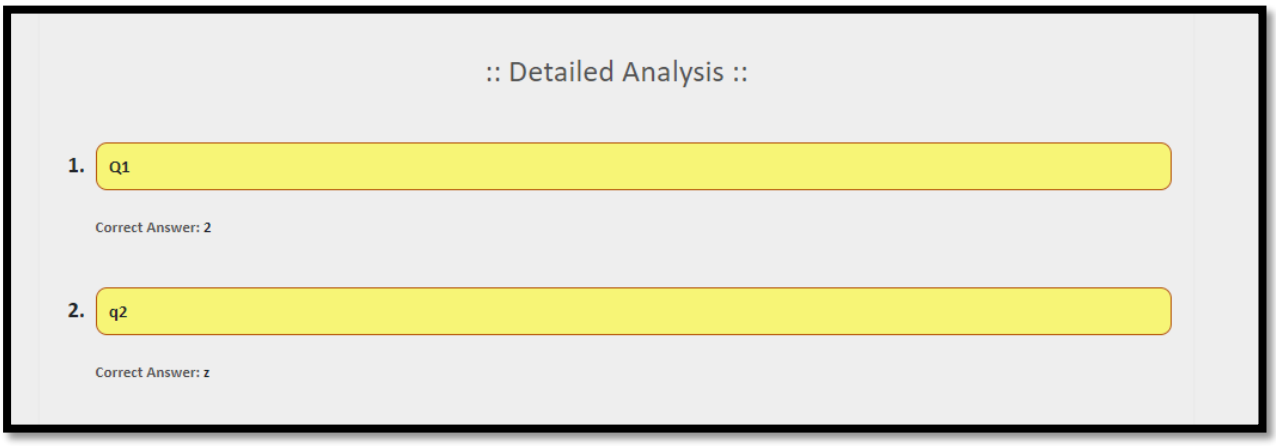
Monitor a Quiz:

Once the quiz is enabled by the faculty and the students starts the quiz, the faculty is able to monitor the students at what time their face is not detected by the camera. This can also happen when they switch tabs.

a. Results

Fig. 7.7: Students can see their results with their right answers and their Statistics.

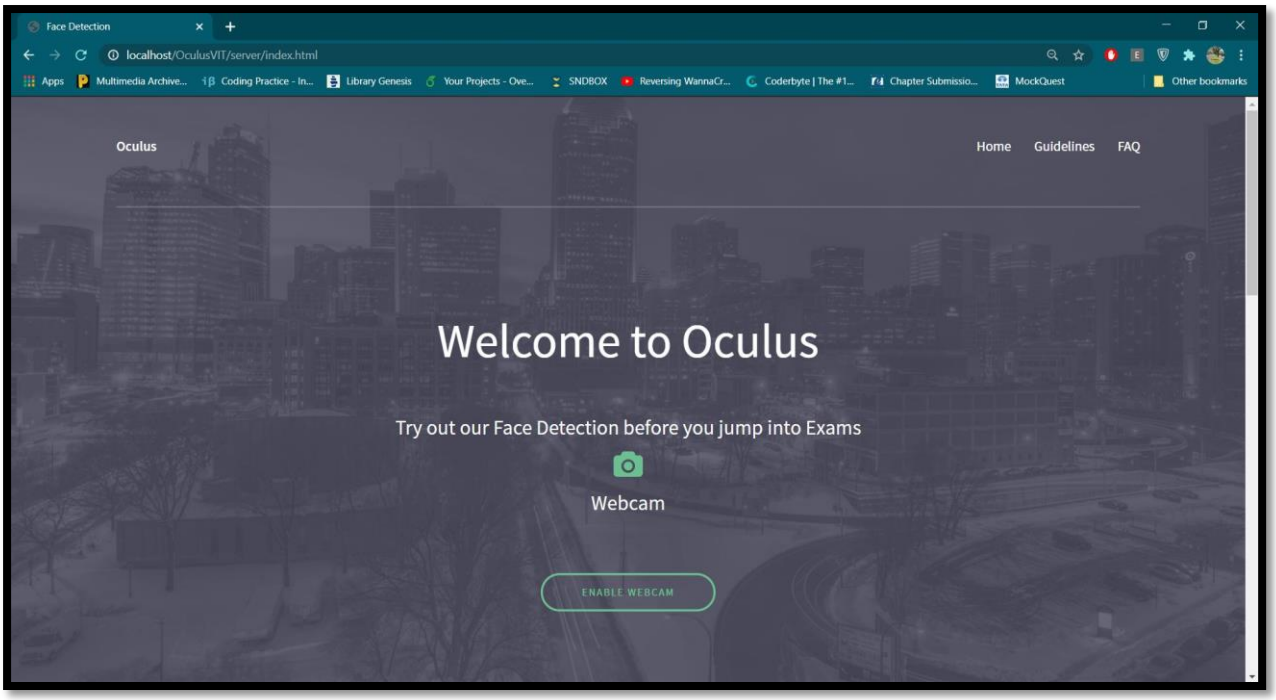




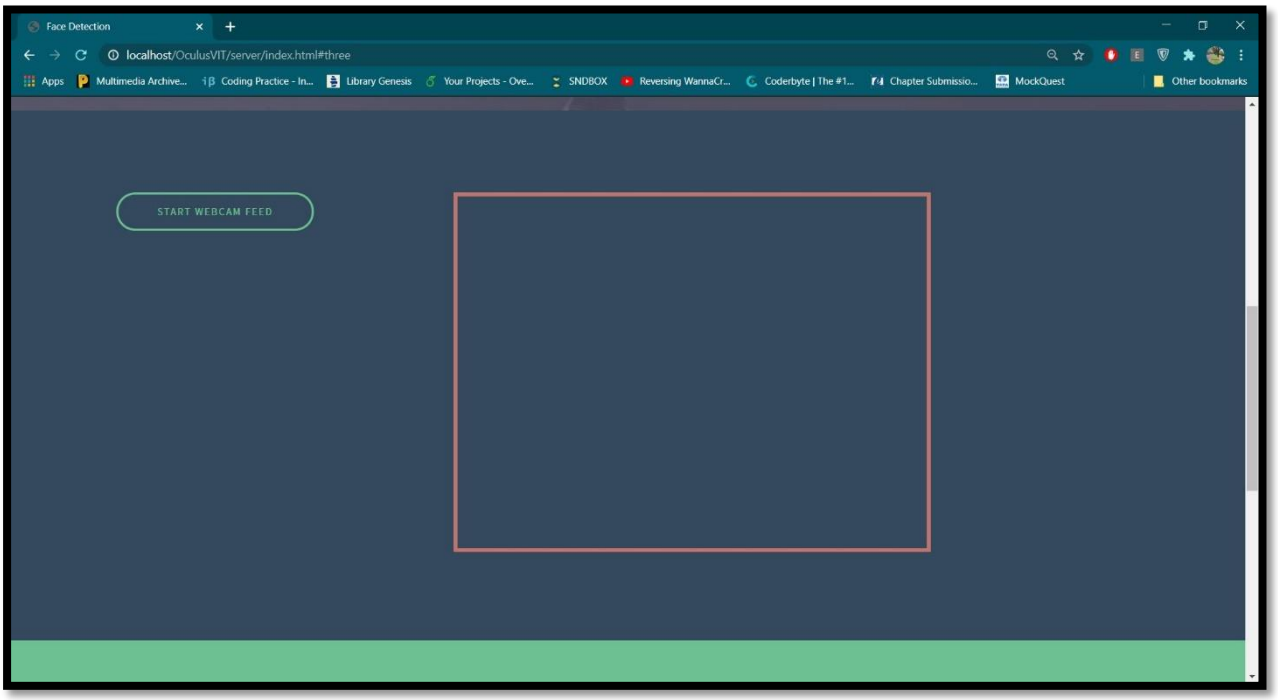
b. Webcam Compatibility

Fig. 7.8: Students can see check if their webcam is compatible with the tool as well as the exam.

Fig. 7.9: The Page that you land after clicking Webcam Compatibility:



After you click “Enable Webcam”:



Get in Touch Page:

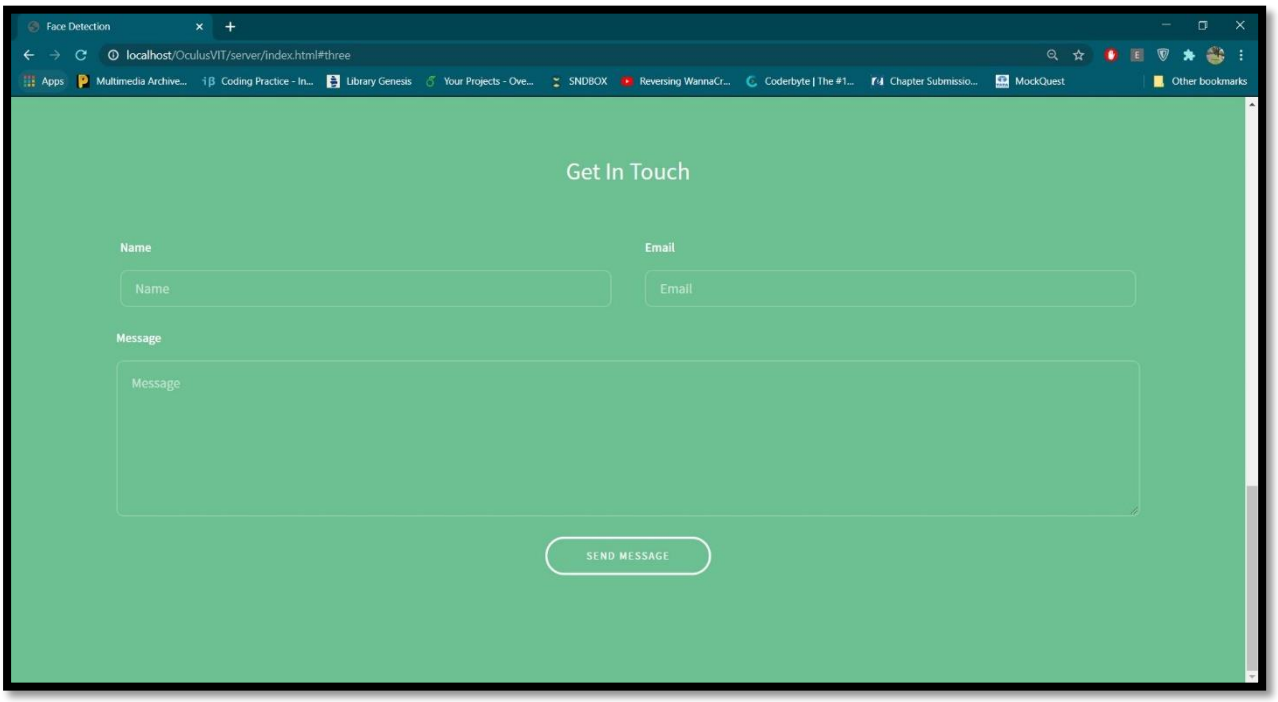
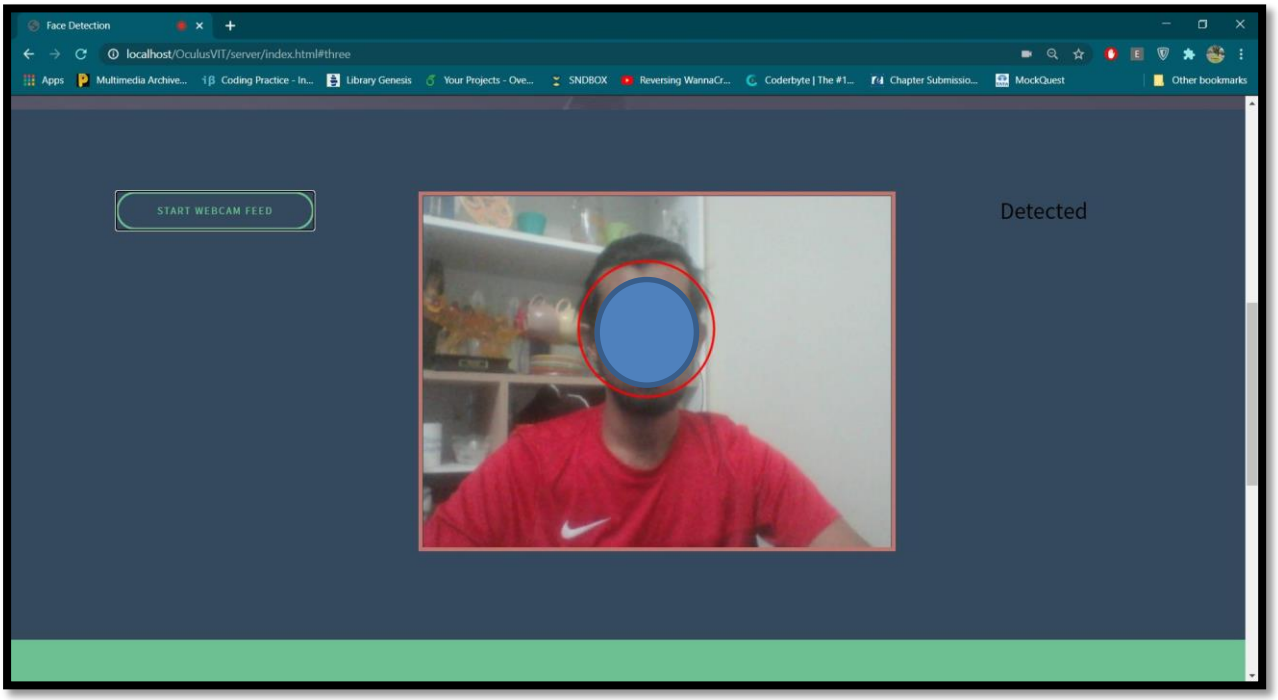
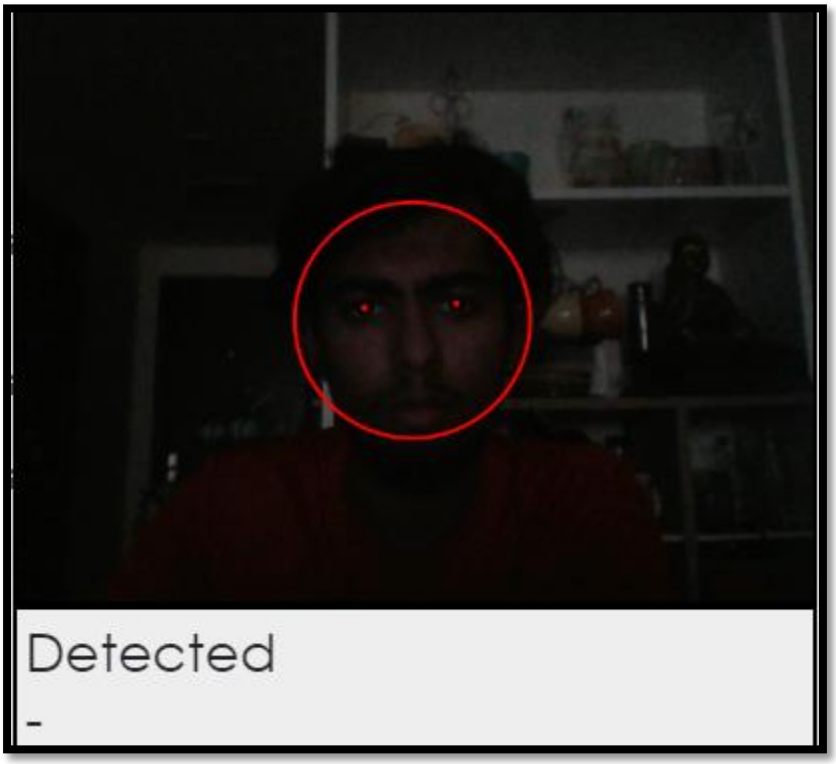


Fig. 7.10: Webcam performing Detection after clicking “Start Webcam”

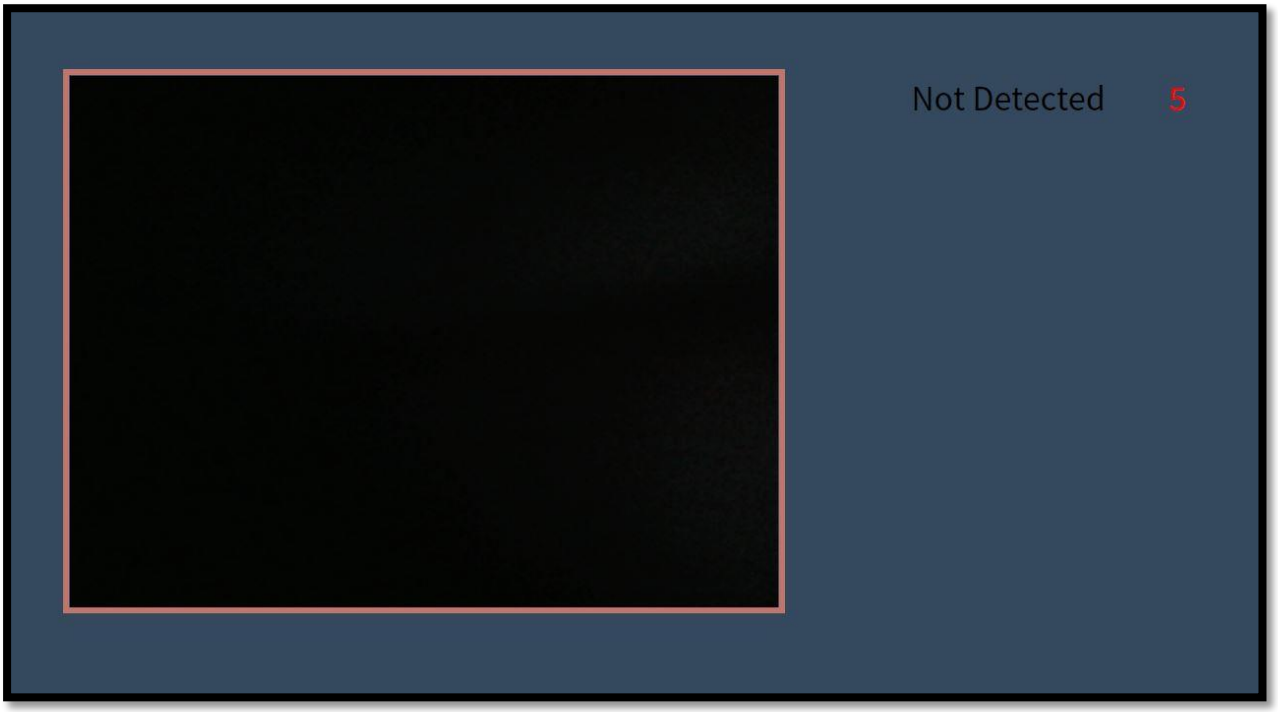
Normal Condition:



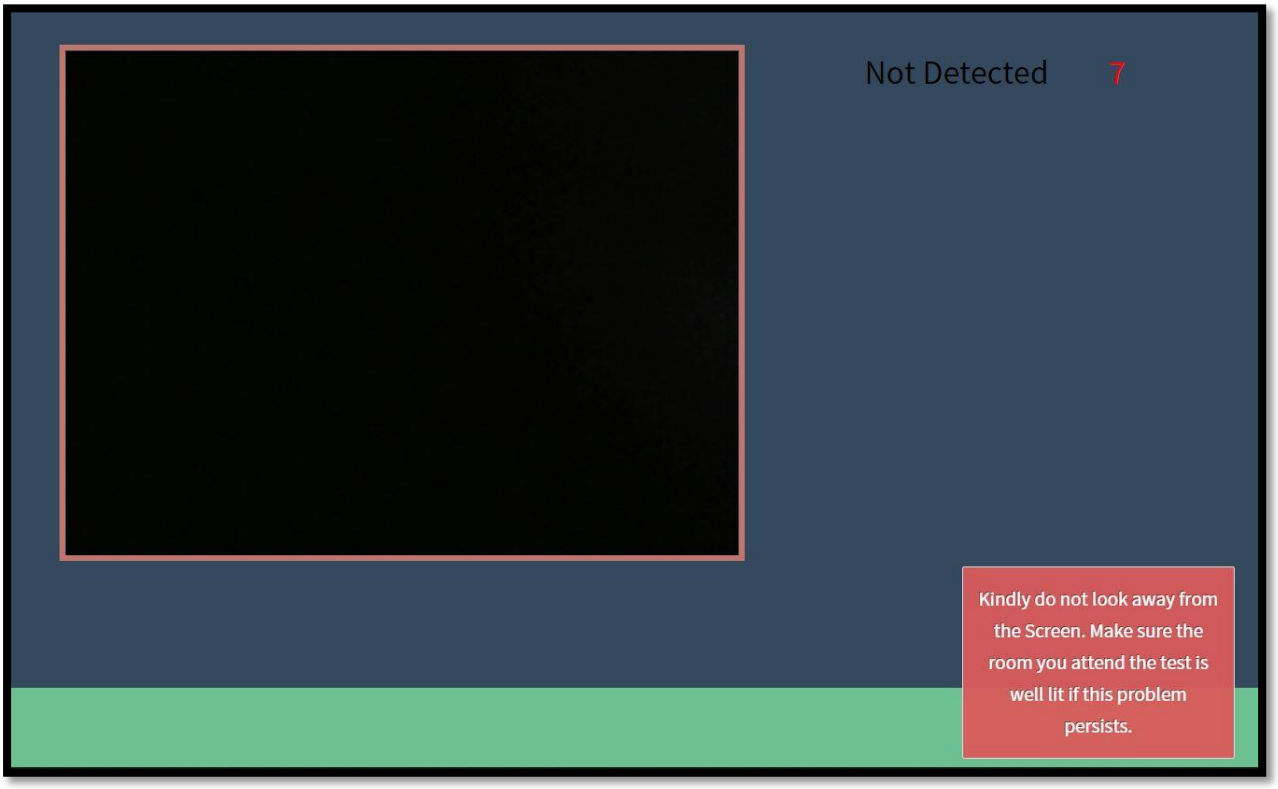
Low Light:



When the face is not detected:

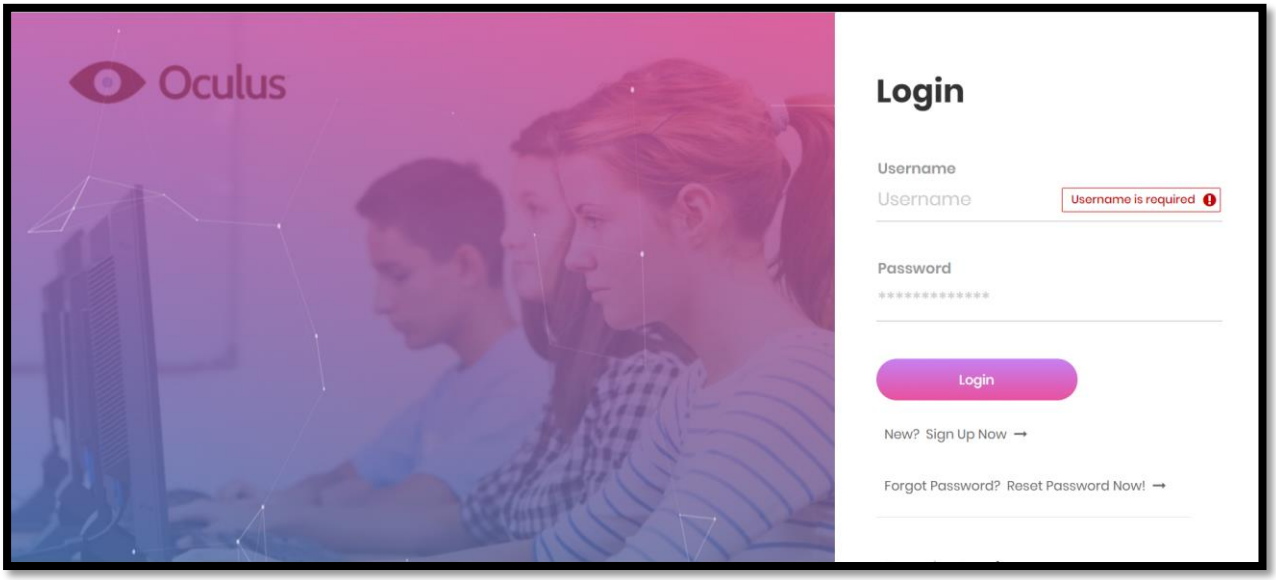


Error message shown after 5 seconds when the face is still not detected:



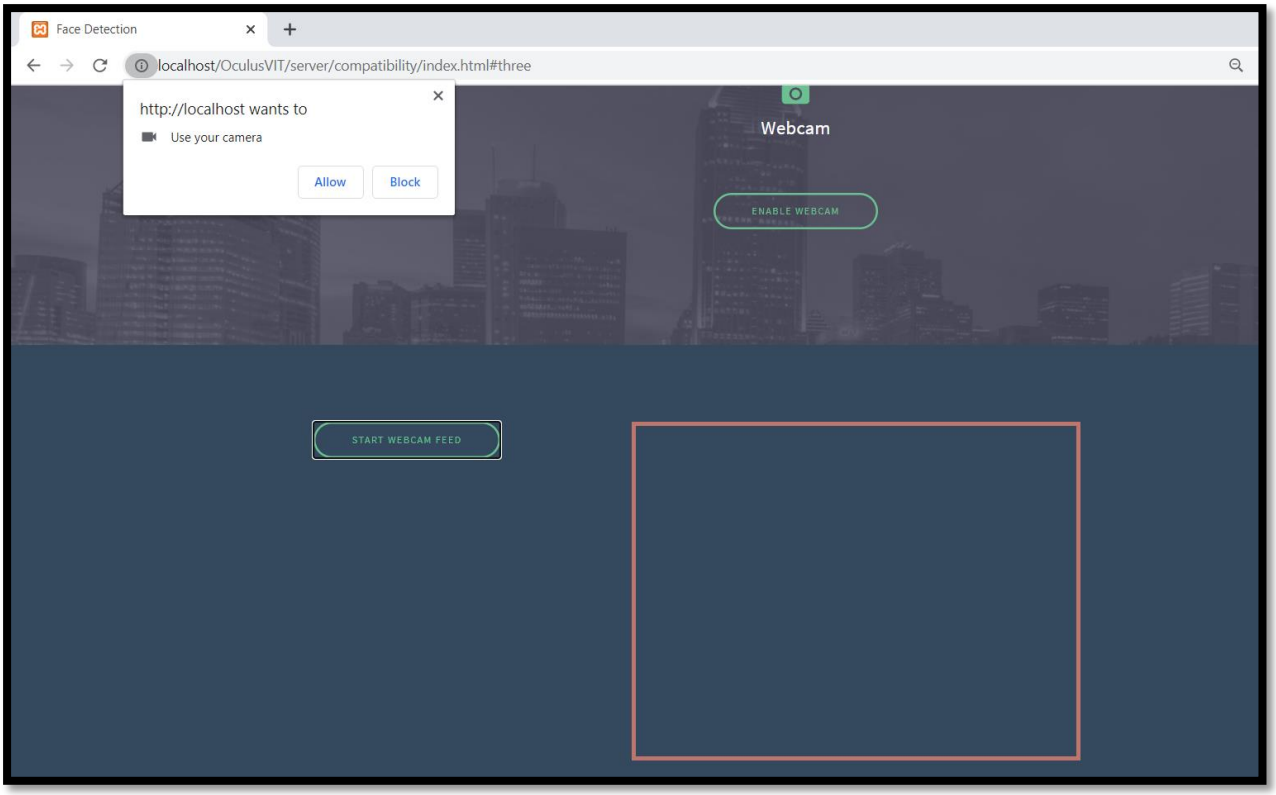
10. Interfaces Validation with Nielsen's 10 point heuristics

1. Visibility of System Status



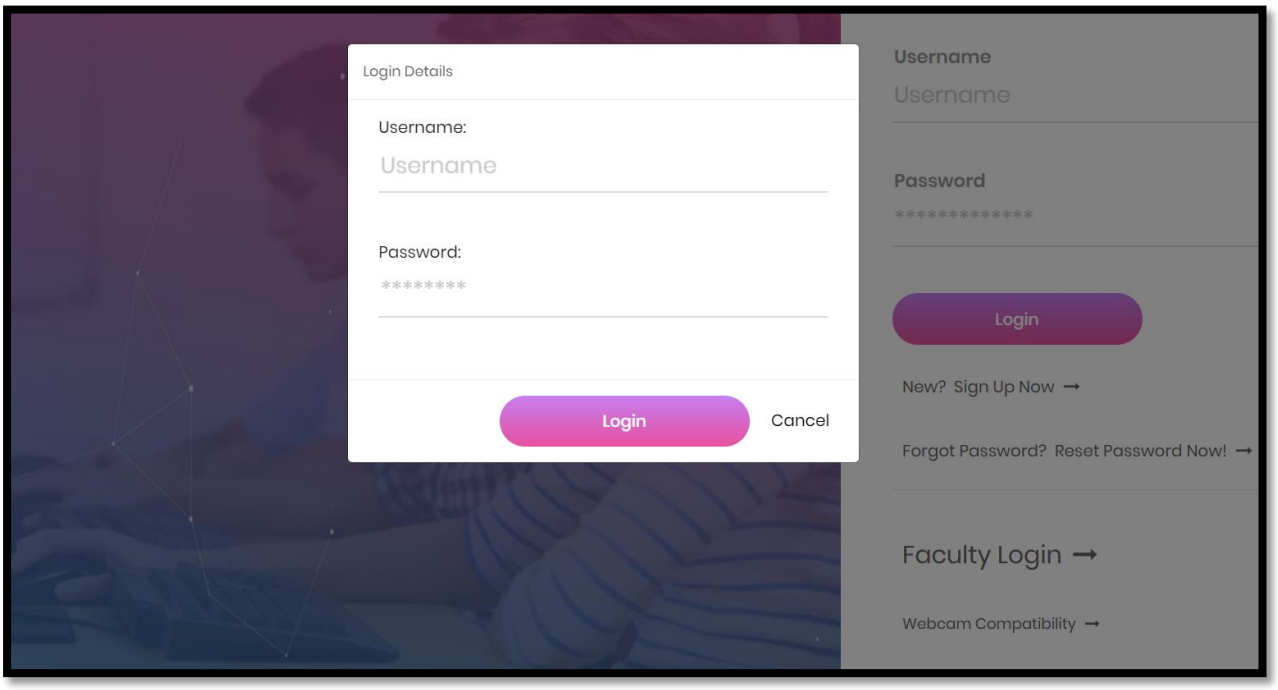
This is the landing home page of our website. The user can see exactly what our website does after logging in. Not too much information is added to ensure in less distraction or confusion for the user.

2. Match between the system and the real world



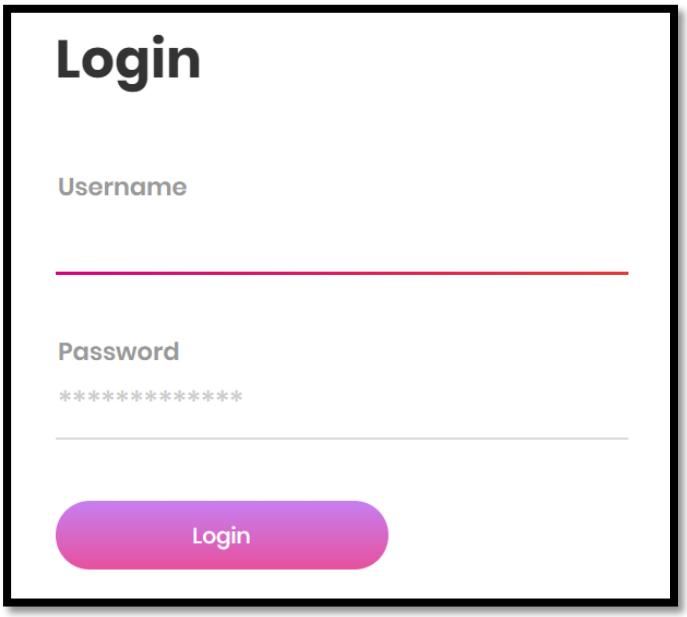
Like the real world where a person requires consent of someone else to take pictures for privacy issues, our webcam compatibility page does a double check with the user if they wish to allow us to access their webcam thus enabling it, such that the student is able to take the quiz.

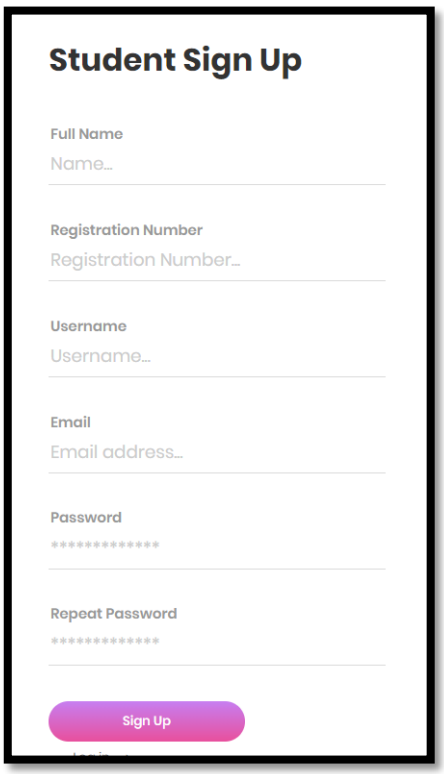
3. User control and freedom



The user is free to move around the landing home page which is the login page to check out the different features our website provides. If they accidently click one feature which in the example above is the Faculty Login. If the user is a student they can easily press the 'Cancel' button to go back to the main login page that is the student login page. This gives the user a chance to undo and redo any actions that they do.

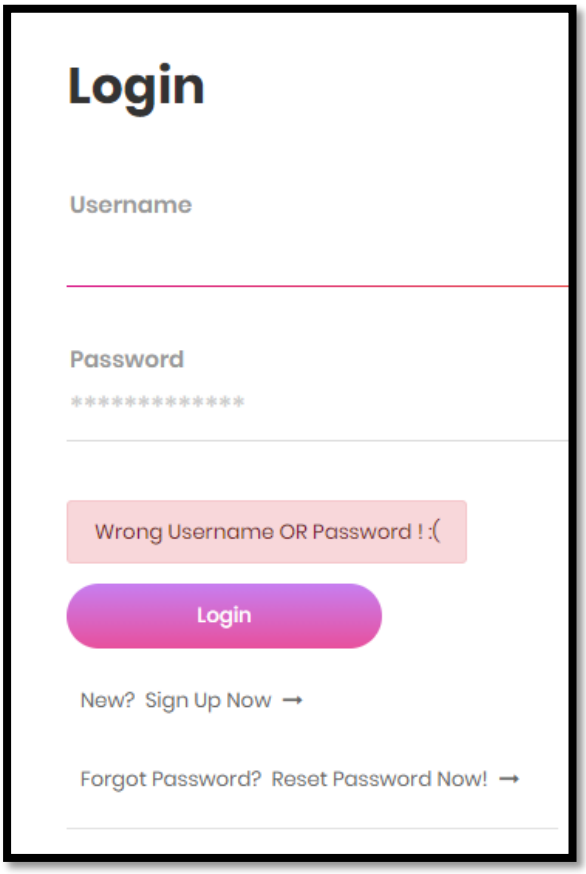
4. Consistency and standards





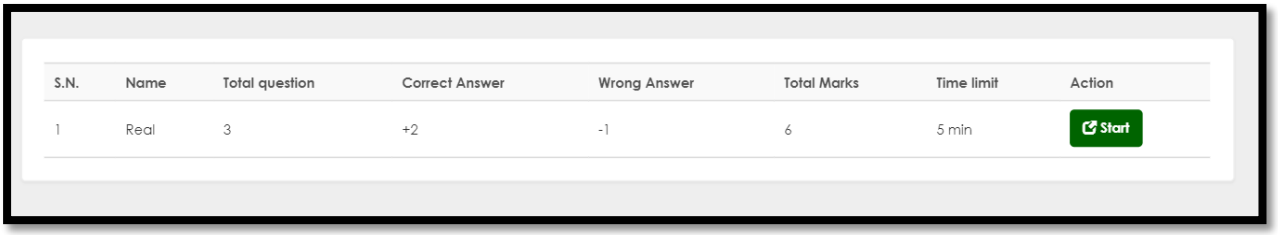
As from the above two examples, we have used the same font style as well as all information is clearly displayed for the user for both the signup and the login page. This can ease the mind of a brand new user who wishes to register an account, they know that they have clicked the right option and is on the right page.

5. Error prevention



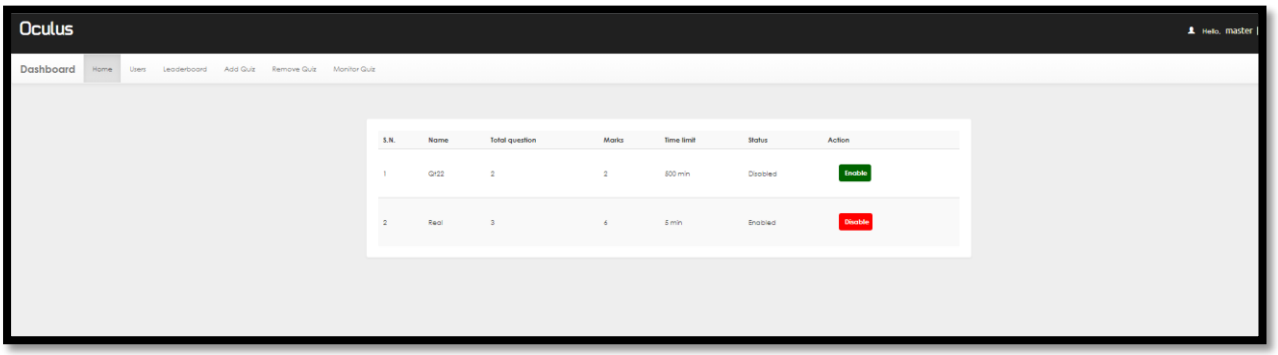
If the user accidently wrote the wrong password or username and have tried logging in the alert 'Wrong Username or Password! ☹' is displayed. So if the user has forgotton their password we have a forgot password option which upon clicking it tells the user what all to do for resetting the password. Giving this extra feature helps the user to prevent any future errors.

6. Recognition and recall



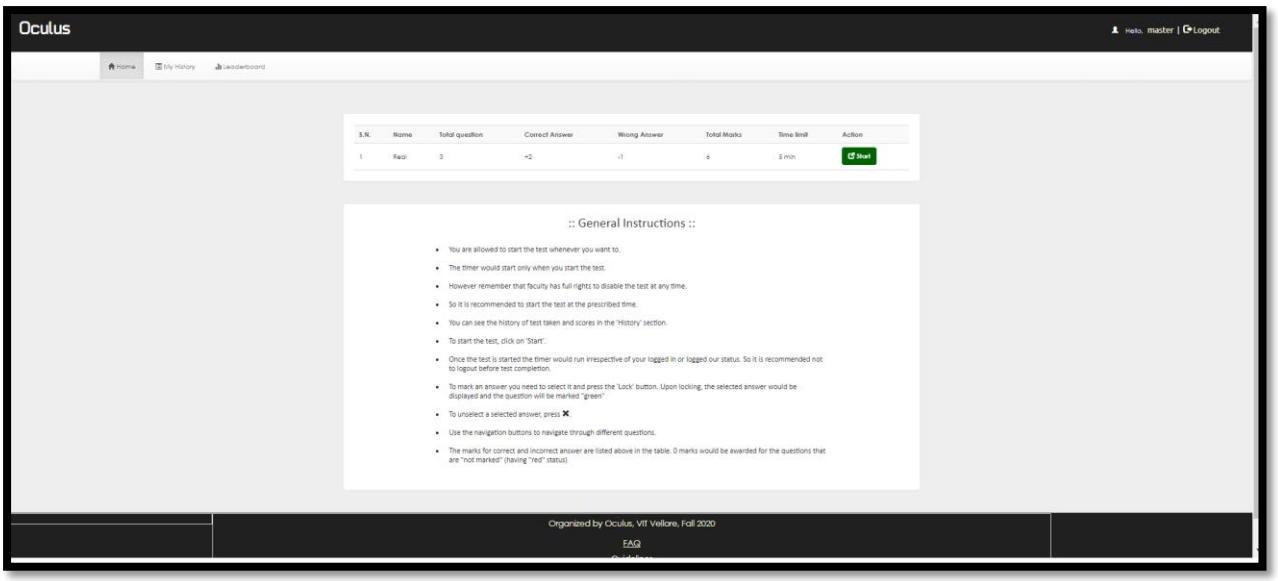
Rather than clicking multiple options once logging in to find the information of the particular quiz that they have to take the student upon logging in has the important information regarding the quiz right in front of them as displayed in the image above.

7. Flexibility and efficiency of use



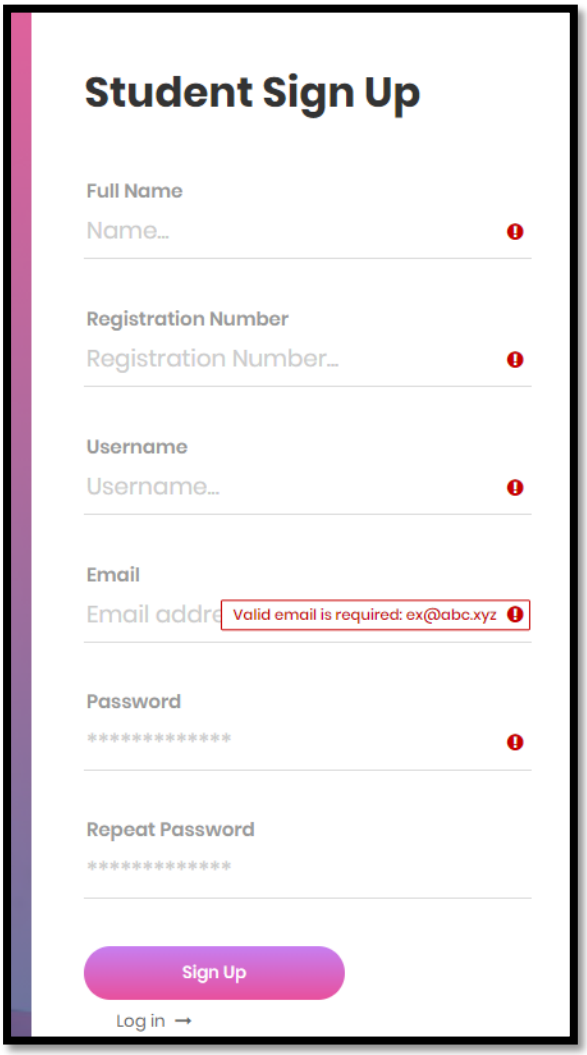
For both the student and faculty home page a dashboard is present with different options for each. These features helps the user to tailor frequent actions as it is easy for them to find such options and so easier to use them. The system can cater to both experienced and inexperienced users.

8. Aesthetic and minimalist design



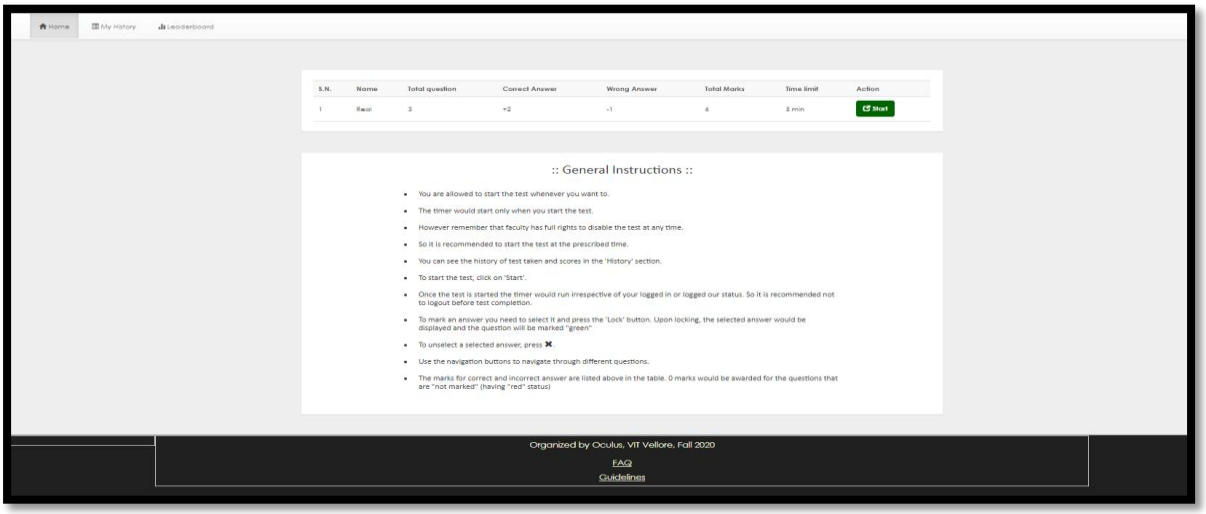
The system has no irrelevant information. Our landing page is the login page in which all the options are clearly displayed. All the options are to the point and hence follows minimilastic pattern. Such that our login page has just 5 features, the login page, the faculty login feature, the signup feature, the reset password feature and the webcam compatibility for the students to see if their webcam is compatible with our system.

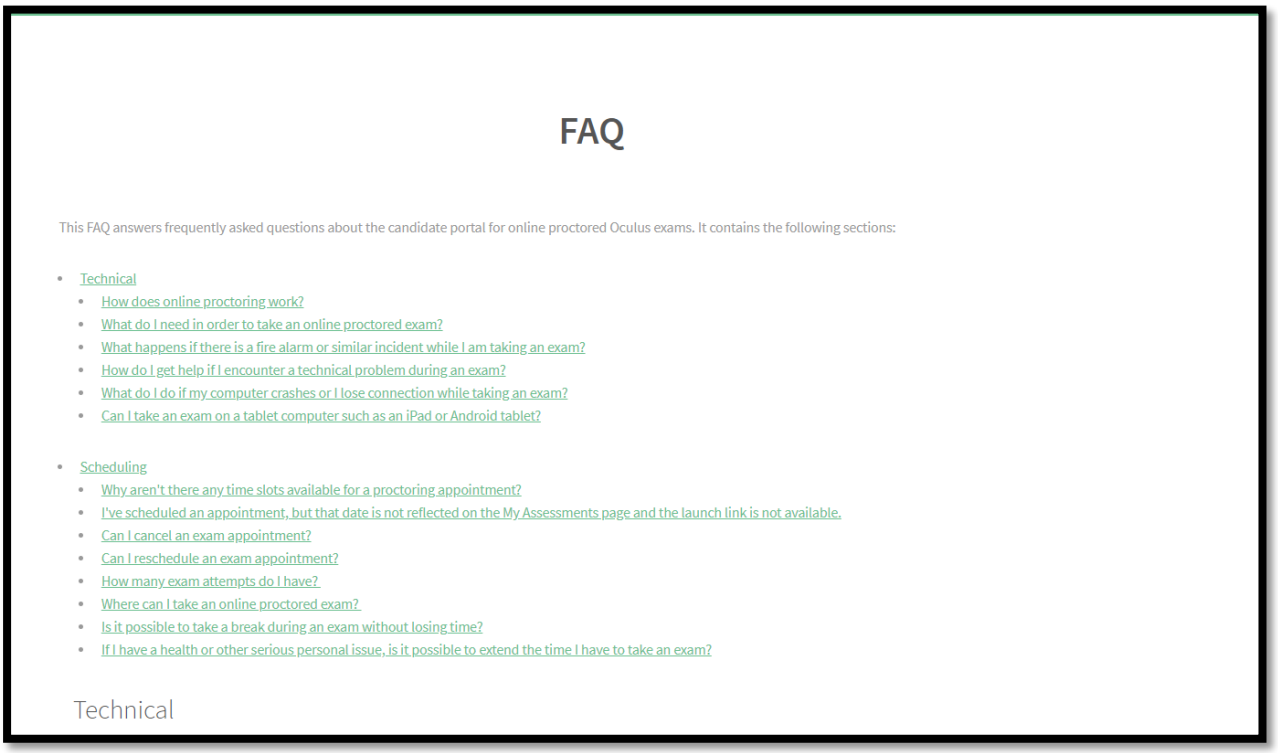
9. Help users recognize, diagnose and recover from errors.



From the image above which is the Signup page, we have clearly informed the users when an error is occurred which is the red exclamation marks. Upon hovering over the exclamation mark, the error description is given which in the case for email address shows the error wherein the valid email is required with a format given. We have precisely indicated the problem and then suggested a solution that is providing immediate feeback with specific instructions.

10. Help and Documentation



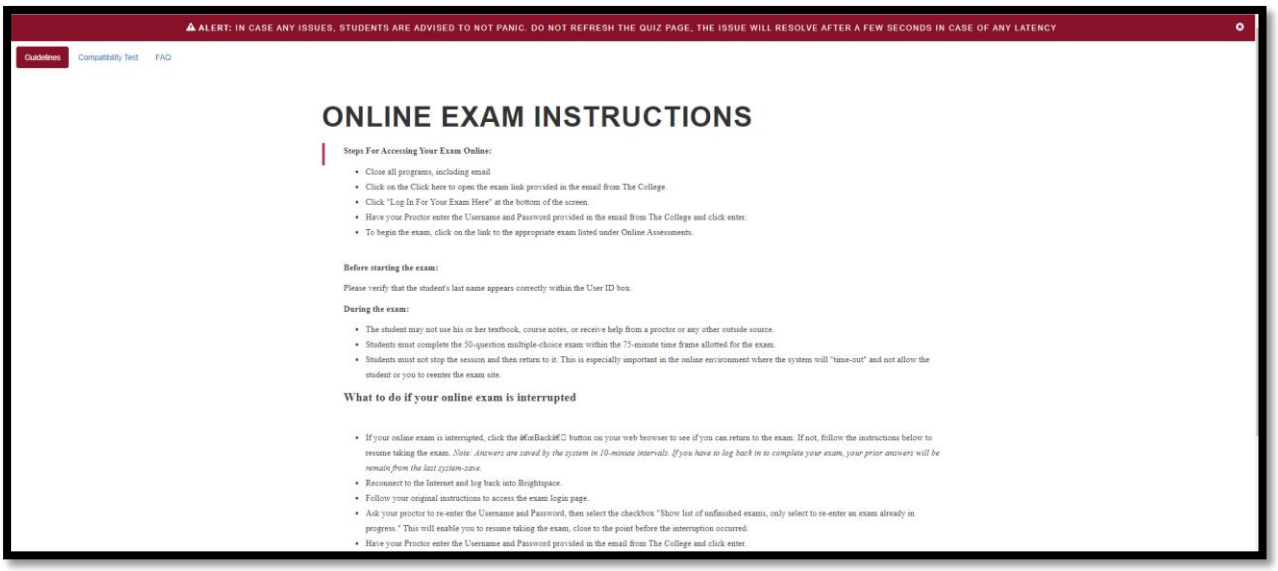


FAQ

This FAQ answers frequently asked questions about the candidate portal for online proctored Oculus exams. It contains the following sections:

- Technical
  - How does online proctoring work?
  - What do I need in order to take an online proctored exam?
  - What happens if there is a fire alarm or similar incident while I am taking an exam?
  - How do I get help if I encounter a technical problem during an exam?
  - What do I do if my computer crashes or I lose connection while taking an exam?
  - Can I take an exam on a tablet computer such as an iPad or Android tablet?
- Scheduling
  - Why aren't there any time slots available for a proctoring appointment?
  - I've scheduled an appointment, but that date is not reflected on the My Assessments page and the launch link is not available.
  - Can I cancel an exam appointment?
  - Can I reschedule an exam appointment?
  - How many exam attempts do I have?
  - Where can I take an online proctored exam?
  - Is it possible to take a break during an exam without losing time?
  - If I have a health or other serious personal issue, is it possible to extend the time I have to take an exam?

Technical



ALERT: IN CASE ANY ISSUES, STUDENTS ARE ADVISED TO NOT PANIC. DO NOT REFRESH THE QUIZ PAGE, THE ISSUE WILL RESOLVE AFTER A FEW SECONDS IN CASE OF ANY LATENCY

Guidelines | Compatibility Test | FAQ

ONLINE EXAM INSTRUCTIONS

Steps For Accessing Your Exam Online:

- Close all programs, including email
- Click on the Click here to open the exam link provided in the email from The College.
- Click "Log In For Your Exam Here" at the bottom of the screen.
- Have your Proctor enter the Username and Password provided in the email from The College and click enter.
- To begin the exam, click on the link to the appropriate exam listed under Online Assessments.

Before starting the exam:

Please verify that the student's last name appears correctly within the User ID box.

During the exam:

- The student may not use his or her textbook, course notes, or receive help from a proctor or any other outside source.
- Students must complete the 50-question multiple-choice exam within the 75-minute time frame allotted for the exam.
- Students must not stop the session and then return to it. This is especially important in the online environment where the system will "time-out" and not allow the student or you to reenter the exam site.

What to do if your online exam is interrupted

- If your online exam is interrupted, click the â€œBackâ€ button on your web browser to see if you can return to the exam. If not, follow the instructions below to resume taking the exam. *Note: Answers are saved by the system in 10-minute intervals. If you have to log back in to complete your exam, your prior answers will be remain from the last system-save.*
- Reconnect to the Internet and log back into Brightspace.
- Follow your original instructions to access the exam login page.
- Ask your proctor to re-enter the Username and Password, then select the checkbox "Show list of unfinished exams, only select to re-enter an exam already in progress." This will enable you to resume taking the exam, close to the point before the interruption occurred.
- Have your Proctor enter the Username and Password provided in the email from The College and click enter.

Our system provides an FAQ and Guidelines page which is accessible once either the student or faculty login in and reach their landing page. The information displayed gives the user all the information required for their tasks, and lists out concrete steps to be carried out

11. Comparative Analysis with other existing technologies discussed in point number no. 5

Limitations of the Existing Technology:

Mercer | Mettl	**Examus**	**ProctorU**
Expensive	Supports Limited Mobile Platforms	Noticeable latency in starting a test
Does not give a free trial	Not ideal for startups, freelancers and agencies	Too sensitive to allow even a little noise such as muttering

How does Oculus compare to its rivals:

Features	Observation
Cost	• Free (Beta Version) • Subsidized Cost (Stable Release)
Platforms Supported	All Platforms and browsers are supported
Trial-Version	Yes
Latency	No visible latency due to client side processing
Targeted Audience	• Startups • Schools • Universities • Corporate
Unique Selling Proposition (USP)	• Contains a proprietary Quiz Platform • Real Time Analytics and Statistics • One Stop for all the requirements post exams including feedback and monitoring. • Privacy of Examinees • Comfortable and Inspiring UI/UX

Detailed:

Oculus is primarily intended for audience who are starting to use online proctoring system to conduct their examination. It is intended for beginners and expert users alike. Attention is paid to UI/UX to make it comfortable for students since most of them will be attending an online exam for the first time. Webcam compatibility test is provided so that they can get accustomed to the platform. The existing solutions tend to overview such small features and their software turns out looking very unapproachable.

Faculties also are taken care of with clear cut instructions provided and a detailed set of Guidelines proved as a contingency measure. They can also view their class's performance real time with the violations of the set rules for Face Detection.

Having a Quiz platform in built helps emerging users to use it as a wholesome tool rather than having to conduct feasibility test for each test-taking platform whether their tools function there an then to combine statistics later.

Oculus was designed to counter the cons of the existing solutions and to make this solution accessible to the general public. In terms of comparative analysis it respect to performance time, Oculus fares well with its rivals.

12. Conclusion & Future Scope:

In the present scenario due to COVID-19, colleges and schools have turned to Internet and technology for different ways to continue the studies of their students. Due to this, E-learning's importance have grown exponentially such that the different aspects of it must be done perfectly so that the students can have a normal college experience via online mode. One such part is Online Examination. This is an integral and vital component of online learning.

As these online exams don't have the physical presence of invigilators supervising the exams, different colleges and schools are looking for an online exam management system, which can detect malpractice during online exams. Oculus software can be used in any situation that requires a certification/degree where the candidates are judged by their merit. The most prominent examples being colleges and schools employing an online learning pedagogy.

Oculus can also be used to determine if students are paying attention in their classes. This system can be employed in schools/colleges where remote learning would be the method used for learning for the foreseeable future. It can also be extended to a corporate scenario where quality control of employees are being held and where mandatory training sessions are expected to be attended with full observational capacity (In case of safety/security training for Defense, Hospitals, Police Forces etc.)

Future Work:

- A mask detection mechanism is being planned to be added as an extra feature that would make Oculus stand out from its competitors.
- Features like Face ID for authentication and improved statistical analysis is also being worked on.
- Stable release that would include an audio detection software with custom threshold setting.
- Reduce the size of software so that it is more accessible.
- Improved Security of the platform.
- Addition of news letters to showcase the current work of Oculus and how new technologies are used to expand and improve accuracy.
- Expansion of our tool beyond local region to international.

13. REFERENCES

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[10] https://www.nngroup.com/articles/ten-usability-heuristics/

14. Appendix:

a. Link to PPT

https://docs.google.com/presentation/d/1uboDL2v4JhqH3BrvKXTUqmVWTBHFkG_T3Z7kaBGBlvE/edit?usp=sharing

b. Link to Pre-recorded Demonstration video

https://www.youtube.com/watch?v=RKykzOK43ZI

c. Link to access source files and file containing steps to execute the project

Github: https://github.com/AadarshSree/OculusVIT.git

Steps:

Setting up the Software:

1. Clone the repository from https://github.com/AadarshSree/OculusVIT.git and save it on the host computer.
2. Download XAMMP sever and run MySQL and Apache in the control panel.
3. Proceed to the htdocs folder inside xammp directory [\xammp\htdocs]
4. Copy the repository that you had downloaded and paste it into the htdocs folder
5. Open the XAMMP control panel and click Admin, it'll redirect to the phpmyadmin plaform. Create a Database (oculusvit) and import the SQL table (oculusvit) that is located in [\xammp\htdocs\OculusVIT\server\db_files]. Make sure all the queries have been imported successfully.
6. Now proceed to preferred browser and head to the OculusVIT directory and run Login.php [http://localhost/OculusVIT/server/Login.php]

Using the Platform:

Setting up a New Account, Signing In and Password Reset:

1. Click on "New? Sign Up Now" and enter the required details and click submit
2. Click on "Login" for Student Login with the new credentials and on "Faculty Login" for Faculty Login
3. If you are a returning user and forgot your password, click on "Forgot Password? Reset Password Now!" and enter your credentials. Proceed to enter the OTP sent to your email and then set a new password. Then Login again.

Webcam Compatibility:

You can use the compatibility page to test whether your environment is suitable for an Online Test and accurate face detection.

Student Portal:

1. At the "Home" page you can find the enabled quizzes. Click on them to attend.
    a) Enable webcam access.
    b) Click on Lock to finalize your answer and reset to clear the answer.
    c) Click on Submit and type "Yes" to confirm.
2. You can view your test history at "My History" page
3. "Leaderboard" displays the sorted order of test takers by their score.

Faculty Portal:

1. In the "Home" page, you can enable or disable existing quizzes.
2. In the "Users" page, you can view the students who are registered to the portal and is permitted to attempt the quiz.
3. "Leaderboard" displays the sorted order of test takers by their score.
4. "Add Quiz" page enables the faculties to set up the quiz.
    a) Under the "Enter Quiz Details", specify the quiz title, the number of questions, marks awarded upon each right and wrong answer and the time limit. "Click Submit".
    b) Then proceed to enter the Questions and their correct answer and Click Submit
    c) Go back to "Home" and enable the Quiz.
5. In the "Remove Quiz" page, you can delete quizzes after their completion.
6. In the "Monitor Quiz" page, each violation can be monitored by faculty after selecting the Quiz that is being attempted and the student can be identified by their Registration number. Each violation is marked by their number along with their time stamp.