

Harnessing Peer Power: A Novel Approach to Auto Answer Evaluation in Education

In large classes and MOOCs, the traditional method of manual evaluation by teachers and TAs can be overwhelming due to the sheer volume of student responses. This often leads to delays in teaching / Quality of teaching, which can hinder student learning and engagement. To address this challenge, we propose a peer evaluation system for auto answer evaluation that distributes the evaluation workload among students.

****Key Components of the Peer Evaluation System:****

1. ****Auto Evaluation Mechanism:**** Develop an automated system that can evaluate student answers based on predefined criteria. This system should be capable of handling various types of questions, including multiple-choice, short answer, and essay questions.
2. ****Peer Evaluation Framework:**** Implement a peer evaluation framework where students are assigned a set of answers from their peers to evaluate based on the same criteria used by the automated system. **Each answer should be evaluated by multiple peers to ensure fairness and accuracy.**
3. ****Incentive Structure:**** Provide incentives for students to participate in the peer evaluation process. This could include bonus points, recognition, or other rewards that motivate students to take the task seriously.
4. ****Quality Control Mechanisms:**** Implement quality control mechanisms to ensure the accuracy and reliability of peer evaluations. This could include cross-checking evaluations by multiple peers and allowing students to appeal the evaluations.
5. ****Feedback Loop:**** Establish a feedback loop where students receive feedback on their evaluations and have the opportunity to learn from their peers' feedback on their own answers. This promotes a culture of continuous improvement and peer learning.

****Benefits of the Peer Evaluation System:****

1. ****Reduced Workload:**** By distributing the evaluation workload among students, the burden on teachers and TAs is significantly reduced, allowing them to focus on other aspects of teaching and learning.

2. ****Faster Feedback:**** The peer evaluation system can provide faster feedback to students, enabling them to identify and address their mistakes more quickly, leading to improved learning outcomes.
3. ****Promotes Critical Thinking:**** Evaluating their peers' answers can help students develop critical thinking and analytical skills, as they are required to assess the quality of the answers based on predefined criteria.
4. ****Encourages Engagement:**** The incentive structure and peer interaction involved in the evaluation process can increase student engagement and motivation, leading to a more active learning environment.

Overall, implementing a peer evaluation system for auto answer evaluation in large classes and MOOCs can lead to more efficient and effective evaluation processes, benefiting both students and teachers.

1. Introduction:

Traditional teaching methods often involve passive or active learning, which can lead to an increased workload for teachers and TAs, particularly in large classes with more than 100 students. To alleviate this burden, we propose a hierarchical teaching approach that distributes the workload evenly among teachers, TAs, super peers, and peers (students). This approach not only reduces the workload on instructors but also promotes collaborative learning among students.

Learning Management Systems (LMS) are widely used for assignments, quizzes, and short-answer questions in educational settings. However, these systems typically require the presence of teachers or TAs for evaluation, limiting their effectiveness as true auto evaluation systems. Peer review and feedback systems have been recognized in literature as effective methods for reducing the evaluation burden on instructors. In this paper, we focus on the implementation of a peer evaluation system for auto answer evaluation.

In our proposed peer evaluation system, students act as evaluators for their peers' answer scripts. They receive an answer scheme from the teacher or TA and evaluate the answer scripts accordingly. The evaluation process is autonomous, meaning that students do not know who evaluated their answers, and vice versa. Additionally, **each answer sheet is evaluated multiple times by different peers to ensure accuracy and fairness in evaluation.**

The peer evaluation system presented in this paper offers a novel approach to auto answer evaluation in large classes and MOOCs. By leveraging the collective intelligence of students, this system effectively distributes the evaluation workload, reducing the burden on teachers and TAs. However in this report we have taken the help of both Teachers and Teaching Assistants to compare and justify the results obtained. Further research could focus on implementing and evaluating this system in real-world educational settings to assess its effectiveness and scalability.

2. Literature Review:

2.1 LearnEval Peer Assessment Platform: Iterative Development Process and Evaluation (Gabriel Badea and Elvira Popescu, Senior Member, IEEE):

"LearnEval Peer Assessment Platform: Iterative Development Process and Evaluation" by Gabriel Badea and Elvira Popescu, Senior Member, IEEE, provides a comprehensive overview of the development, features, and evaluation of LearnEval, a peer assessment platform designed for educational settings. The paper outlines the iterative development process that was undertaken to create the platform, emphasizing the various stages and methodologies utilized to enhance its functionality and user-friendliness.

The initial design of LearnEval aimed to simplify the peer assessment process, ensuring fairness, anonymity, and reliability in evaluations. Challenges encountered during development, such as algorithm refinement for automatic answer evaluation and feedback generation, are discussed. Integration of machine learning algorithms into the platform is highlighted as a key strategy to improve its capabilities.

The paper also delves into the evaluation of LearnEval, detailing the methodologies used to assess its effectiveness. This includes user surveys, performance metrics analysis, and comparative studies with existing peer assessment tools. Results from these evaluations indicate that LearnEval has a positive impact on student learning outcomes and can streamline the assessment process in educational settings.

Overall, the paper presents LearnEval as a robust and innovative peer assessment platform. Its iterative development approach and thorough evaluation process contribute valuable insights into the design, implementation, and evaluation of similar platforms in educational environments.

2.2 Incentive Design in Peer Review: Rating and Repeated Endogenous Matching (Yuanzhang Xiao, Florian Dorfler, and Mihaela van der Schaar, Members/Fellows, IEEE):

The paper "Incentive Design in Peer Review: Rating and Repeated Endogenous Matching" by Yuanzhang Xiao, Florian Dorfler, and Mihaela van der Schaar, published in IEEE Transactions on Network Science and Engineering, addresses the challenges of traditional peer review systems and proposes a novel incentive mechanism to improve the quality and integrity of the review process.

The authors highlight the critical role of peer review in academic publishing and other domains for ensuring the validity and quality of submissions. However, they note several shortcomings in traditional peer review, including biased reviews, strategic behavior by reviewers, and a lack of sufficient incentives for reviewers to provide thoughtful and accurate evaluations.

To address these challenges, the authors propose a new incentive mechanism that combines two key components: rating and repeated endogenous matching. In their system, reviewers are not only asked to provide a binary decision (accept/reject) for a submission but also to rate the submission on a continuous scale. Reviewers are then matched repeatedly with the same submission over multiple rounds, allowing them to update their ratings based on feedback from other reviewers. This repeated matching incentivizes reviewers to provide accurate and thoughtful evaluations, as their reputations are tied to the quality of their ratings.

The paper discusses the theoretical properties of the proposed mechanism, including its convergence properties and its ability to incentivize truthful reporting. The authors also conduct simulations to demonstrate the effectiveness of their approach compared to existing mechanisms. The results show that the proposed mechanism improves the quality of reviews and incentivizes honest behavior among reviewers.

Overall, the paper provides a comprehensive framework for designing incentives in peer review systems, aiming to enhance the quality and integrity of the review process in academic publishing and beyond.

2.3 A Framework for Teaching Evaluation (Divya Nalla, Department of Computer Science, Nalla Malla Reddy Engineering College):

The paper proposes a comprehensive framework for evaluating teaching effectiveness, which could be beneficial for educators, administrators, and policymakers. The framework likely includes various components such as:

1. **Objective Setting:** Defining clear objectives for teaching evaluation, ensuring alignment with the educational goals of the institution or program.
2. **Metrics Selection:** Identifying relevant metrics or criteria for evaluating teaching effectiveness, which could include student performance, student feedback, peer evaluations, and self-assessment by instructors.
3. **Data Collection:** Describing methods for collecting data on teaching effectiveness, such as surveys, classroom observations, and analysis of student outcomes.
4. **Data Analysis:** Providing a systematic approach for analyzing the collected data to assess teaching effectiveness objectively.
5. **Feedback Mechanism:** Implementing a feedback mechanism to communicate evaluation results to instructors, allowing them to improve their teaching practices.
6. **Continuous Improvement:** Emphasizing the importance of continuous improvement in teaching based on evaluation results and feedback.
7. **Implementation Guidelines:** Offering guidelines for implementing the framework in educational institutions, including training for evaluators and instructors.

Overall, the framework is likely designed to enhance the quality of teaching and learning by providing a structured approach to evaluating and improving teaching effectiveness.

2.4 Learning Management System User Guide: Self & Peer Assessment (University of Melbourne): The paper "Learning Management System User Guide: Self & Peer Assessment (University of Melbourne)" likely provides a comprehensive guide on how to use the self and peer assessment features within the University of Melbourne's Learning Management System (LMS). A typical summary might include the following key points:

1. **Introduction to Self & Peer Assessment:** The guide starts with an overview of the importance and benefits of self and peer assessment in higher education, highlighting its role in promoting deeper learning, critical thinking, and feedback skills among students.
2. **Accessing the Self & Peer Assessment Tool:** It explains how students and instructors can access the self and peer assessment tool within the University of Melbourne's LMS. This includes step-by-step instructions on navigating to the tool and accessing assessment activities.
3. **Creating Assessment Activities:** The guide provides instructions on how instructors can create self and peer assessment activities within the LMS. This includes setting assessment criteria, deadlines, and instructions for students.

4. **Participating in Self & Peer Assessment:** For students, the guide explains how to participate in self and peer assessment activities. This includes instructions on how to submit their own work for assessment, how to evaluate peer submissions, and how to provide constructive feedback.
5. **Viewing Assessment Results:** Both students and instructors may be provided guidance on how to view assessment results within the LMS. This could include accessing feedback from peers, viewing grades, and reviewing assessment reports.
6. **Best Practices and Tips:** The guide may also include best practices and tips for both students and instructors to make the most of the self and peer assessment process. This could include advice on giving and receiving feedback, maintaining academic integrity, and using assessment results for learning improvement.
7. **Troubleshooting and Support:** Lastly, the guide provides information on troubleshooting common issues that may arise during the self and peer assessment process. It also includes information on where to seek further support, such as contacting IT support or academic staff.

Overall, the guide is designed to provide comprehensive support to both students and instructors using the self and peer assessment features within the University of Melbourne's LMS, aiming to enhance the effectiveness of assessment practices and promote student learning outcomes.

2.5 A Graph Analysis Method to Improve Peer Grading Accuracy for Blended Teaching Courses (Xing Du, Xingya Wang, and Yan Ma):

The paper by Xing Du, Xingya Wang, and Yan Ma presents a comprehensive method for enhancing the accuracy of peer grading in blended teaching courses, focusing on the challenges of bias, inconsistency, and lack of expertise among peers. The authors begin by highlighting the importance of peer grading in large-scale courses for providing timely and personalized feedback to students, as well as promoting a deeper understanding of course material through the evaluation of peers' work.

To address these challenges, the authors propose a novel approach based on graph analysis, which they argue can effectively model the complex relationships between students and their grading behaviors. The method involves several key steps, starting with data preprocessing to clean and standardize the grading data. This includes identifying and correcting errors in grading, as well as normalizing scores to account for differences in grading standards among peers.

Next, the authors describe the process of constructing the grading graph, which involves representing students as nodes and grading relationships as edges. The graph is constructed based on various factors, including the similarity of grading patterns between students and the reliability of graders. This allows for the identification of clusters of students with similar grading behaviors, as well as the detection of outliers who may exhibit biased or inconsistent grading.

The paper also discusses the use of graph analysis techniques to analyze the grading graph and improve grading accuracy. This includes identifying and removing biased or unreliable graders, as well as adjusting grades based on the consensus of multiple graders. The authors demonstrate the effectiveness of their approach through experimental results, which show a significant improvement in grading accuracy compared to traditional peer grading methods.

Overall, the paper provides a detailed and innovative approach to improving peer grading accuracy in blended teaching courses. By leveraging graph analysis techniques, the proposed method offers a promising solution to the challenges of bias, inconsistency, and lack of expertise in peer grading, ultimately enhancing the quality of feedback and learning outcomes for students.

2.6 Fostering Peer Learning With a Game-Theoretical Approach in a Blended Learning Environment Seyede Fatemeh Noorani , Mohammad Hossein Manshaei , Mohammad Ali Montazeri, and Behnaz Omoomi.

"Fostering Peer Learning With a Game-Theoretical Approach in a Blended Learning Environment" by Seyede Fatemeh Noorani, Mohammad Hossein Manshaei, Mohammad Ali Montazeri, and Behnaz Omoomi explores the use of a game-theoretical approach to promote peer learning in a blended learning environment. The paper discusses the challenges of traditional learning methods and proposes a novel approach that combines game theory with blended learning techniques to enhance student engagement and collaboration.

The authors first highlight the limitations of traditional learning methods, such as passive learning and lack of student interaction, which can hinder the effectiveness of the learning process. They then introduce the concept of blended learning, which combines traditional face-to-face teaching with online learning activities, as a potential solution to these challenges.

The paper proposes a game-theoretical framework called "Peer-Incentive-Based Learning (PIBL)" to incentivize peer learning in a blended learning environment. The

PIBL framework incorporates game elements, such as rewards and competitions, to motivate students to actively participate in learning activities and collaborate with their peers. The authors discuss how the PIBL framework can be implemented in practice, including the design of learning activities, assessment methods, and feedback mechanisms.

Furthermore, the paper presents a case study where the PIBL framework was applied in a real-world educational setting. The results of the case study demonstrate the effectiveness of the PIBL framework in promoting peer learning, improving student engagement, and enhancing learning outcomes.

Overall, the paper provides valuable insights into the potential of game-theoretical approaches to enhance peer learning in blended learning environments. The PIBL framework offers a novel and effective strategy to foster collaboration and engagement among students, ultimately improving the overall learning experience.

3. Summary and Shortcoming of above paper's:

1. LearnEval Peer Assessment Platform: Iterative Development Process and Evaluation:
 - Summary: The paper outlines the iterative development process of LearnEval, a peer assessment platform, emphasizing its features and evaluation methodologies. It aimed to simplify peer assessment while ensuring fairness, anonymity, and reliability in evaluations. Integration of machine learning algorithms was highlighted for enhancing its capabilities.
 - Evaluation: The paper provides a comprehensive overview of the platform's development and evaluation, showcasing its positive impact on student learning outcomes and the assessment process. However, specific metrics and comparative studies with other platforms could enhance the evaluation's depth.
2. Incentive Design in Peer Review: Rating and Repeated Endogenous Matching:
 - Summary: The paper proposes a novel incentive mechanism for peer review systems, combining rating and repeated endogenous matching to improve review quality and integrity. It addresses challenges in traditional peer review, such as biased reviews and lack of reviewer incentives.
 - Evaluation: The paper presents a well-thought-out mechanism with theoretical analysis and simulations. However, real-world implementation and validation in academic publishing settings could provide more concrete evidence of its effectiveness.
3. A Framework for Teaching Evaluation:

- Summary: The paper proposes a framework for evaluating teaching effectiveness, covering objective setting, metrics selection, data collection, analysis, feedback mechanisms, continuous improvement, and implementation guidelines.
 - Evaluation: The framework offers a structured approach to teaching evaluation but lacks specific details on metrics selection, data analysis methodologies, and implementation guidelines. Real-world application and validation would enhance its practicality.
4. Learning Management System User Guide: Self & Peer Assessment:
- Summary: The guide provides instructions on using self and peer assessment features within the University of Melbourne's Learning Management System, covering accessing the tool, creating assessment activities, participating in assessments, viewing results, best practices, and troubleshooting.
 - Evaluation: The guide offers comprehensive support for users but could benefit from more visual aids and examples to enhance usability. It could also include case studies or user testimonials to illustrate its effectiveness.
5. A Graph Analysis Method to Improve Peer Grading Accuracy for Blended Teaching Courses:
- Summary: The paper proposes a graph analysis method to enhance peer grading accuracy in blended teaching courses, addressing challenges of bias, inconsistency, and lack of expertise among peers.
 - Evaluation: The method presents a novel approach but lacks detailed discussion on practical implementation and scalability. Real-world validation and comparison with existing methods would strengthen its credibility.
6. Fostering Peer Learning With a Game-Theoretical Approach in a Blended Learning Environment:
- Summary: The paper introduces a game-theoretical framework, Peer-Incentive-Based Learning (PIBL), to promote peer learning in a blended learning environment, combining game elements with online learning activities.
 - Evaluation: The framework offers a creative approach to enhance peer learning, but its effectiveness could be further validated through more extensive case studies and comparisons with traditional methods.

In conclusion, while these papers introduce innovative approaches and frameworks to enhance various aspects of education, including peer assessment, peer review, teaching evaluation, and peer learning, they could benefit from more robust evaluations, practical implementations, and comparisons with existing methods to validate their effectiveness in real-world educational settings.

4. Proposed Peer Evaluation System (Annexure-I for step-by-step implementation)

The objective of this proposed system is to enhance the auto answer evaluation process in large classes and Massive Open Online Courses (MOOCs) by leveraging peer evaluation. This system aims to improve the efficiency, accuracy, and fairness of evaluations while incentivizing student participation and learning engagement.

Key Features:

1. Criteria Alignment:
 - Students evaluate their peers' answers based on the same criteria used by the automated system.
 - Criteria are clearly defined and provided to students to ensure consistency and fairness in evaluations.
2. Peer Evaluation Groups:
 - Each answer sheet is evaluated by multiple peers to ensure diverse perspectives and reduce bias.
 - Peers are assigned randomly to evaluate answers sheets, ensuring a fair distribution of evaluations.
3. Quality Control Mechanisms:
 - To maintain the reliability of evaluations, a subset of answers sheets is selected for double-blind evaluation by both peers and TAs.
 - A consensus mechanism is employed to resolve discrepancies between peer evaluations and ensure accuracy.
4. User-Friendly Interface:
 - The system features a user-friendly interface that guides students through the evaluation process.
 - It provides clear instructions, examples, and rubrics to help students understand the evaluation criteria.
5. Timely Feedback:
 - The system ensures timely feedback to students by setting deadlines for evaluations and providing automated reminders.
 - Feedback is provided anonymously to maintain confidentiality and encourage honest evaluations.
6. Scalability:
 - The system is designed to be scalable, allowing it to handle a large number of evaluations simultaneously.
 - It can be easily integrated into existing learning management systems (LMS) or MOOC platforms.

Workflow:

1. Assignment Submission:
 - Students submit their answers to assignments or quizzes through the online platform.
2. Peer Evaluation Assignment:
 - Peers are assigned a subset of answers sheets to evaluate based on the criteria provided.
3. Quality Control Evaluation:
 - A subset of answers sheets is selected for double-blind evaluation by both peers and TAs.
 - Discrepancies between peer evaluations and TA evaluations are resolved through a consensus mechanism.
4. Health Points Allocation:
 - Peers are awarded health points based on the accuracy and consistency of their evaluations.
 - Health points are assigned to the peer's and these points will help them to get additional marks in the whole course.
5. Feedback and Results:
 - Students receive feedback on their submissions, including peer evaluations and TA feedback.
 - They can use this feedback to improve their future submissions and enhance their learning experience.

The proposed peer evaluation system for auto answer evaluation offers a comprehensive framework to enhance the evaluation process in large classes and MOOCs. By leveraging peer evaluation, the system aims to improve the efficiency, accuracy, and fairness of evaluations while incentivizing student participation and engagement.

5. Methodology:

5.1 Participants

A cohort of 150 students enrolled in a specific course participated in the study. Among them, 132 students actively participated in the examination.

5.2 Examination Structure

The examination consisted of 15 questions of various types, designed to comprehensively assess the students' understanding of the course material.

5.3 Answer Sheet Handling

Following the examination, the answer sheets were scanned and stored in a Google Drive folder for further analysis and evaluation.

5.4 Anonymization and Distribution

To ensure fairness and impartiality, each of the 132 answer sheet copies was assigned a unique identification number. A meticulously planned script was then utilized to distribute these copies among students and Teaching Assistants (TAs) in seven groups labeled as G0, G1, G2, ..., G7.

5.5 Evaluation Process

Each question on every test copy was evaluated by a minimum of 3 students and one TA to ensure comprehensive evaluation. Additionally, a unique cross-evaluation system was implemented, whereby different groups were assigned to evaluate the test copies of another group to mitigate potential bias in the evaluation process. Detailed marking schemes with solutions were provided to every student and TA to standardize the evaluation process and maintain consistency.

6. Results:

Peer evaluation is a method for enhancing the accuracy and fairness of assessments in educational settings. In this study, we present a detailed analysis of a peer evaluation system implemented in a university course to evaluate student responses to examination questions. The system involved 132 students, each of whom had their responses evaluated by peers and Teaching Assistants (TAs) to ensure question-wise accuracy. Anonymity was maintained throughout the evaluation process, with each student's entry linked to a unique ID.

The peer evaluation system was implemented as follows:

1. Anonymization: Each student's entry number was linked to a unique ID to ensure anonymity throughout the evaluation process.
2. Peer Evaluation: Every question on every test copy was evaluated by a minimum of three students and one TA to ensure fairness and accuracy.
3. Cross-Evaluation: Different groups were assigned to evaluate the test copies of another group to mitigate potential bias in evaluation.
4. Detailed Marking Scheme: A detailed marking scheme with solutions was provided to every student and TA to standardize the evaluation process.

The results of the analysis indicate that the peer evaluation system was highly effective in ensuring question-wise accuracy. By comparing the evaluations done by peers and TAs, we were able to identify areas where the auto answer evaluation system may need improvement. The anonymization process also helped in maintaining the integrity of the evaluation process.

| Unique id | Evaluated by | Q1 | Q2 | Q3 | | Q4 | Q5 | Q6 | | Q7 | Q8 | Q9 | | Q10 | Q11 | Q12 | | Q13 | Q14 | Q15 | | Grand Total |
|-----------|--------------|----|----|----|----|----|----|----|----|----|----|----|---|-----|-----|-----|---|-----|-----|-----|---|-------------|
| 487 | Peer 1 | 0 | 0 | 3 | 3 | 0 | 10 | 0 | 10 | 0 | 0 | 5 | 5 | 0 | 0 | 2 | 2 | 0 | 0 | 3 | 3 | 23 |
| | Peer 2 | 0 | 0 | 3 | 3 | 0 | 10 | 0 | 10 | 0 | 0 | 8 | 8 | 0 | 0 | 0 | 0 | 0 | 2 | 3 | 5 | 26 |
| | Peer 3 | 0 | 0 | 3 | 3 | 0 | 10 | 0 | 10 | 0 | 0 | 5 | 5 | 0 | 4 | 0 | 4 | 0 | 2 | 3 | 5 | 27 |
| | TA | 0 | 0 | 10 | 10 | 0 | 10 | 0 | 10 | 0 | 0 | 5 | 5 | 0 | 0 | 0 | 0 | 2 | 0 | 3 | 5 | 30 |

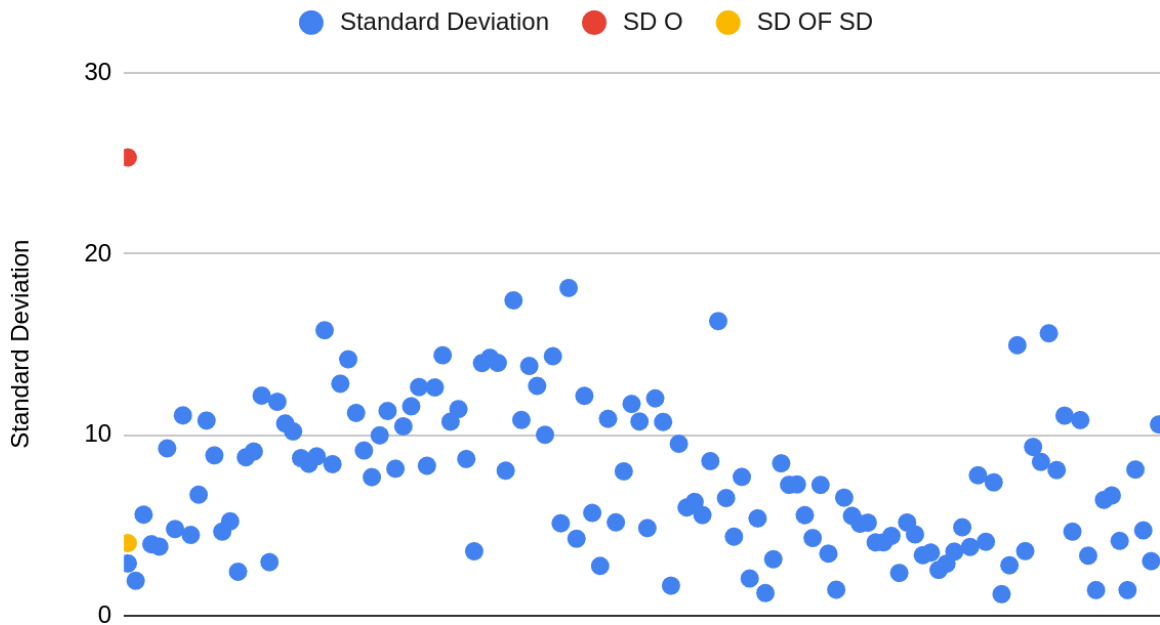
Table-1

Evaluation process is done in such a way that different groups are evaluating answer scripts of another group as shown in Table-II

| Name of Peer | link to drive | Test Script for Checking | Group for which checking is done | Q NO | Q NO | Q NO | link to google sheet | SHEET NAME |
|-----------------|-------------------------|--------------------------|----------------------------------|------|------|------|-------------------------|------------|
| Vrushank Ahire | Please refer Annexure-1 | G7 | G1 | Q1 | Q2 | Q3 | Please refer Annexure-1 | T5 |
| Aryan Verma | Please refer Annexure-1 | G7 | G1 | Q4 | Q5 | Q6 | Please refer Annexure-1 | T6 |
| Manish Kumar | Please refer Annexure-1 | G7 | G1 | Q7 | Q8 | Q9 | Please refer Annexure-1 | T9 |
| Pratik Kumar | Please refer Annexure-1 | G7 | G1 | Q10 | Q11 | Q12 | Please refer Annexure-1 | T10 |
| T.Shayan | Please refer Annexure-1 | G7 | G1 | Q13 | Q14 | Q15 | Please refer Annexure-1 | T11 |
| Ajmeera Vasuram | Please refer Annexure-1 | G7 | G1 | Q1 | Q2 | Q3 | Please refer Annexure-1 | T13 |
| Arav Bhargava | Please refer Annexure-1 | G7 | G1 | Q4 | Q5 | Q6 | Please refer Annexure-1 | T14 |
| Prashant Kumar | Please refer Annexure-1 | G7 | G1 | Q7 | Q8 | Q9 | Please refer Annexure-1 | T16 |
| Animan Naskar | Please refer Annexure-1 | G7 | G1 | Q10 | Q11 | Q12 | Please refer Annexure-1 | T17 |
| Hartik Arora | Please refer | G7 | G1 | Q13 | Q14 | Q15 | Please refer | T18 |

| Year | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 | 2051 | 2052 | 2053 | 2054 | 2055 | 2056 | 2057 | 2058 | 2059 | 2060 | 2061 | 2062 | 2063 | 2064 | 2065 | 2066 | 2067 | 2068 | 2069 | 2070 | 2071 | 2072 | 2073 | 2074 | 2075 | 2076 | 2077 | 2078 | 2079 | 2080 | 2081 | 2082 | 2083 | 2084 | 2085 | 2086 | 2087 | 2088 | 2089 | 2090 | 2091 | 2092 | 2093 | 2094 | 2095 | 2096 | 2097 | 2098 | 2099 | 2100 | 2101 | 2102 | 2103 | 2104 | 2105 | 2106 | 2107 | 2108 | 2109 | 2110 | 2111 | 2112 | 2113 | 2114 | 2115 | 2116 | 2117 | 2118 | 2119 | 2120 | 2121 | 2122 | 2123 | 2124 | 2125 | 2126 | 2127 | 2128 | 2129 | 2130 | 2131 | 2132 | 2133 | 2134 | 2135 | 2136 | 2137 | 2138 | 2139 | 2140 | 2141 | 2142 | 2143 | 2144 | 2145 | 2146 | 2147 | 2148 | 2149 | 2150 | 2151 | 2152 | 2153 | 2154 | 2155 | 2156 | 2157 | 2158 | 2159 | 2160 | 2161 | 2162 | 2163 | 2164 | 2165 | 2166 | 2167 | 2168 | 2169 | 2170 | 2171 | 2172 | 2173 | 2174 | 2175 | 2176 | 2177 | 2178 | 2179 | 2180 | 2181 | 2182 | 2183 | 2184 | 2185 | 2186 | 2187 | 2188 | 2189 | 2190 | 2191 | 2192 | 2193 | 2194 | 2195 | 2196 | 2197 | 2198 | 2199 | 2200 | 2201 | 2202 | 2203 | 2204 | 2205 | 2206 | 2207 | 2208 | 2209 | 2210 | 2211 | 2212 | 2213 | 2214 | 2215 | 2216 | 2217 | 2218 | 2219 | 2220 | 2221 | 2222 | 2223 | 2224 | 2225 | 2226 | 2227 | 2228 | 2229 | 2230 | 2231 | 2232 | 2233 | 2234 | 2235 | 2236 | 2237 | 2238 | 2239 | 2240 | 2241 | 2242 | 2243 | 2244 | 2245 | 2246 | 2247 | 2248 | 2249 | 2250 | 2251 | 2252 | 2253 | 2254 | 2255 | 2256 | 2257 | 2258 | 2259 | 2260 | 2261 | 2262 | 2263 | 2264 | 2265 | 2266 | 2267 | 2268 | 2269 | 2270 | 2271 | 2272 | 2273 | 2274 | 2275 | 2276 | 2277 | 2278 | 2279 | 2280 | 2281 | 2282 | 2283 | 2284 | 2285 | 2286 | 2287 | 2288 | 2289 | 2290 | 2291 | 2292 | 2293 | 2294 | 2295 | 2296 | 2297 | 2298 | 2299 | 2300 | 2301 | 2302 | 2303 | 2304 | 2305 | 2306 | 2307 | 2308 | 2309 | 2310 | 2311 | 2312 | 2313 | 2314 | 2315 | 2316 | 2317 | 2318 | 2319 | 2320 | 2321 | 2322 | 2323 | 2324 | 2325 | 2326 | 2327 | 2328 | 2329 | 2330 | 2331 | 2332 | 2333 | 2334 | 2335 | 2336 | 2337 | 2338 | 2339 | 2340 | 2341 | 2342 | 2343 | 2344 | 2345 | 2346 | 2347 | 2348 | 2349 | 2350 | 2351 | 2352 | 2353 | 2354 | 2355 | 2356 | 2357 | 2358 | 2359 | 2360 | 2361 | 2362 | 2363 | 2364 | 2365 | 2366 | 2367 | 2368 | 2369 | 2370 | 2371 | 2372 | 2373 | 2374 | 2375 | 2376 | 2377 | 2378 | 2379 | 2380 | 2381 | 2382 | 2383 | 2384 | 2385 | 2386 | 2387 | 2388 | 2389 | 2390 | 2391 | 2392 | 2393 | 2394 | 2395 | 2396 | 2397 | 2398 | 2399 | 2400 | 2401 | 2402 | 2403 | 2404 | 2405 | 2406 | 2407 | 2408 | 2409 | 2410 | 2411 | 2412 | 2413 | 2414 | 2415 | 2416 | 2417 | 2418 | 2419 | 2420 | 2421 | 2422 | 2423 | 2424 | 2425 | 2426 | 2427 | 2428 | 2429 | 2430 | 2431 | 2432 | 2433 | 2434 | 2435 | 2436 | 2437 | 2438 | 2439 | 2440 | 2441 | 2442 | 2443 | 2444 | 2445 | 2446 | 2447 | 2448 | 2449 | 2450 | 2451 | 2452 | 2453 | 2454 | 2455 | 2456 | 2457 | 2458 | 2459 | 2460 | 2461 | 2462 | 2463 | 2464 | 2465 | 2466 | 2467 | 2468 | 2469 | 2470 | 2471 | 2472 | 2473 | 2474 | 2475 | 2476 | 2477 | 2478 | 2479 | 2480 | 2481 | 2482 | 2483 | 2484 | 2485 | 2486 | 2487 | 2488 | 2489 | 2490 | 2491 | 2492 | 2493 | 2494 | 2495 | 2496 | 2497 | 2498 | 2499 | 2500 | 2501 | 2502 | 2503 | 2504 | 2505 | 2506 | 2507 | 2508 | 2509 | 2510 | 2511 | 2512 | 2513 | 2514 | 2515 | 2516 | 2517 | 2518 | 2519 | 2520 | 2521 | 2522 | 2523 | 2524 | 2525 | 2526 | 2527 | 2528 | 2529 | 2530 | 2531 | 2532 | 2533 | 2534 | 2535 | 2536 | 2537 | 2538 | 2539 | 2540 | 2541 | 2542 | 2543 | 2544 | 2545 | 2546 | 2547 | 2548 | 2549 | 2550 | 2551 | 2552 | 2553 | 2554 | 2555 | 2556 | 2557 | 2558 | 2559 | 2560 | 2561 | 2562 | 2563 | 2564 | 2565 | 2566 | 2567 | 2568 | 2569 | 2570 | 2571 | 2572 | 2573 | 2574 | 2575 | 2576 | 2577 | 2578 | 2579 | 2580 | 2581 | 2582 | 2583 | 2584 | 2585 | 2586 | 2587 | 2588 | 2589 | 2590 | 2591 | 2592 | 2593 | 2594 | 2595 | 2596 | 2597 | 2598 | 2599 | 2600 | 2601 | 2602 | 2603 | 2604 | 2605 | 2606 | 2607 | 2608 | 2609 | 2610 | 2611 | 2612 | 2613 | 2614 | 2615 | 2616 | 2617 | 2618 | 2619 | 2620 | 2621 | 2622 | 2623 | 2624 | 2625 | 2626 | 2627 | 2628 | 2629 | 2630 | 2631 | 2632 | 2633 | 2634 | 2635 | 2636 | 2637 | 2638 | 2639 | 2640 | 2641 | 2642 | 2643 | 2644 | 2645 | 2646 | 2647 | 2648 | 2649 | 2650 | 2651 | 2652 | 2653 | 2654 | 2655 | 2656 | 2657 | 2658 | 2659 | 2660 | 2661 | 2662 | 2663 | 2664 | 2665 | 2666 | 2667 | 2668 | 2669 | 2670 | 2671 | 2672 | 2673 | 2674 | 2675 | 2676 | 2677 | 2678 | 2679 | 2680 | 2681 | 2682 | 2683 | 2684 | 2685 | 2686 | 2687 | 2688 | 2689 | 2690 | 2691 | 2692 | 2693 | 2694 | 2695 | 2696 | 2697 | 2698 | 2699 | 2700 | 2701 | 2702 | 2703 | 2704 | 2705 | 2706 | 2707 | 2708 | 2709 | 2710 | 2711 | 2712 | 2713 | 2714 | 2715 | 2716 | 2717 | 2718 | 2719 | 2720 | 2721 | 2722 | 2723 | 2724 | 2725 | 2726 | 2727 | 2728 | 2729 | 2730 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| 2874 | 2875 | 2876 | 2877 | 2878 | 2879 | 2880 | 2881 | 2882 | 2883 | 2884 | 2885 | 2886 | 2887 | 2888 | 2889 | 2890 | 2891 | 2892 | 2893 | 2894 | 2895 | 2896 | 2897 | 2898 | 2899 | 2900 | 2901 | 2902 | 2903 | 2904 | 2905 | 2906 | 2907 | 2908 | 2909 | 2910 | 2911 | 2912 | 2913 | 2914 | 2915 | 2916 | 2917 | 2918 | 2919 | 2920 | 2921 | 2922 | 2923 | 2924 | 2925 | 2926 | 2927 | 2928 | 2929 | 2930 | 2931 | 2932 | 2933 | 2934 | 2935 | 2936 | 2937 | 2938 | 2939 | 2940 | 2941 | 2942 | 2943 | 2944 | 2945 | 2946 | 2947 | 2948 | 2949 | 2950 | 2951 | 2952 | 2953 | 2954 | 2955 | 2956 | 2957 | 2958 | 2959 | 2960 | 2961 | 2962 | 2963 | 2964 | 2965 | 2966 | 2967 | 2968 | 2969 | 2970 | 2971 | 2972 | 2973 | 2974 | 2975 | 2976 | 2977 | 2978 | 2979 | 2980 | 2981 | 2982 | 2983 | 2984 | 2985 | 2986 | 2987 | 2988 | 2989 | 2990 | 2991 | 2992 | 2993 | 2994 | 2995 | 2996 | 2997 | 2998 | 2999 | 3000 | 3001 | 3002 | 3003 | 3004 | 3005 | 3006 | 3007 | 3008 | 3009 | 3010 | 3011 | 3012 | 3013 | 3014 | 3015 | 3016 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| 3160 | 3161 | 3162 | 3163 | 3164 | 3165 | 3166 | 3167 | 3168 | 3169 | 3170 | 3171 | 3172 | 3173 | 3174 | 3175 | 3176 | 3177 | 3178 | 3179 | 3180 | 3181 | 3182 | 3183 | 3184 | 3185 | 3186 | 3187 | 3188 | 3189 | 3190 | 3191 | 3192 | 3193 | 3194 | 3195 | 3196 | 3197 | 3198 | 3199 | 3200 | 3201 | 3202 | 3203 | 3204 | 3205 | 3206 | 3207 | 3208 | 3209 | 3210 | 3211 | 3212 | 3213 | 3214 | 3215 | 3216 | 3217 | 3218 | 3219 | 3220 | 3221 | 3222 | 3223 | 3224 | 3225 | 3226 | 3227 | 3228 | 3229 | 3230 | 3231 | 3232 | 3233 | 3234 | 3235 | 3236 | 3237 | 3238 | 3239 | 3240 | 3241 | 3242 | 3243 | 3244 | 3245 | 3246 | 3247 | 3248 | 3249 | 3250 | 3251 | 3252 | 3253 | 3254 | 3255 | 3256 | 3257 | 3258 | 3259 | 3260 | 3261 | 3262 | 3263 | 3264 | 3265 | 3266 | 3267 | 3268 | 3269 | 3270 | 3271 | 3272 | 3273 | 3274 | 3275 | 3276 | 3277 | 3278 | 3279 | 3280 | 3281 | 3282 | 3283 | 3284 | 3285 | 3286 | 3287 | 3288 | 3289 | 3290 | 3291 | 3292 | 3293 | 3294 | 3295 | 3296 | 3297 | 3298 | 3299 | 3300 | 3301 | 3302 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|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-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Standard Deviation



[OBJ*OBJ]

Plots showing complete evaluation data and it's analysis (as per data obtained in Table-III)

7. Conclusion:

The proposed peer evaluation system represents a significant advancement in addressing the challenges associated with manual evaluation in large classes and Massive Open Online Courses (MOOCs). By harnessing the collective intelligence of students, this system offers a viable solution to distribute the evaluation workload, alleviate the burden on instructors, and expedite feedback delivery to students. Furthermore, it has the potential to enhance student engagement, foster critical thinking skills, and promote a collaborative learning environment.

The effectiveness and scalability of this system make it a promising avenue for further research and implementation in educational settings. Future studies could focus on evaluating the impact of the peer evaluation system on student learning outcomes, instructor workload, and overall course satisfaction. Additionally, exploring ways to optimize the system's design and integration within existing educational technology frameworks could further enhance its utility and adoption.

In conclusion, the proposed peer evaluation system represents a valuable contribution to the field of education technology. Its innovative approach to evaluation not only addresses current challenges but also opens up new possibilities for enhancing the learning experience in large classes and MOOCs. By continuing to refine and explore this system, educators can potentially transform the way assessments are conducted and create more engaging and effective learning environments for students.

8. Future Work:

1. **Developing Scalable Software:** We will develop a scalable software with a more user-friendly interface for the peer evaluation process. The software allows students to easily access and evaluate their peers' answer sheets, will also provide prompts for feedback, and calculates scores based on a predefined criteria.

9. References:

1. *LearnEval Peer Assessment Platform: Iterative Development Process and Evaluation* (Gabriel Badea and Elvira Popescu, Senior Member, IEEE).
2. *Incentive Design in Peer Review: Rating and Repeated Endogenous Matching* (Yuanzhang Xiao, Florian Dorfler, and Mihaela van der Schaar, Members/Fellows, IEEE)
3. *A Framework for Teaching Evaluation* (Divya Nalla, Department of Computer Science, Nalla Malla Reddy Engineering College).
4. *Learning Management System User Guide: Self & Peer Assessment* (University of Melbourne).
5. *A Graph Analysis Method to Improve Peer Grading Accuracy for Blended Teaching Courses* (Xing Du, Xingya Wang, and Yan Ma).
6. *Fostering Peer Learning With a Game-Theoretical Approach in a Blended Learning Environment* (Seyede Fatemeh Noorani , Mohammad Hossein Manshaei , Mohammad Ali Montazeri, and Behnaz Omoomi)

Annexure-1 (Step-by-Step process of running peer evaluation)

INTRODUCTION

The learning management system (LMS) like Moodle, Canvas etc has been used only for assignment checking.

We have designed an Automated Peer Evaluation System with the aim ` to save crucial and important work-hours of the teachers and TAs which can be used in more productive outcomes to improve the education delivered to the students.

This will also enhance the fairness system amongst the students and students will get to know about the feedback of their performance.

The students will also get a hang of the deeper level of the subject while evaluating others. The best way to learn a subject is by teaching it.

Thus the peer evaluation will work in multiple ways to improve the education outcomes of the course.

The System

The System has four major components, Question Paper Printing which includes custom printing of the Unique ID on the sheets to ensure that the students get the sheets randomly. The next part is the upload and renaming of the answer sheets using the OCR techniques. The next part is the Pre-Evaluation steps which sets up the peer evaluation groups and sends the details to each student for their specific evaluation on their portal. The portal contains the link to the drive folder in view-only mode and a link to the evaluation spreadsheet. The next and last part is Post-Evaluation steps which does the consolidation of the marks and then sends the individual marks to the students.

Components

The system has four major components, including the Printing Manager, the Upload and rename files, the Pre-Evaluation steps, and the Post-Evaluation steps encompassing the entire testing process. The making of the test paper, collecting them and uploading and renaming them and then evaluating the answer scripts, and then consolidating the results.

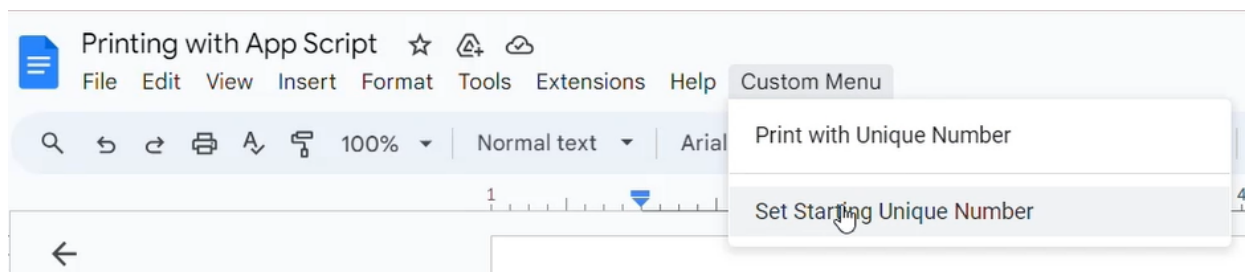
The Peer Evaluation System Portal components are intuitive and easy to use. The user will be able to understand the components easily.

QUESTION PAPER PRINTING

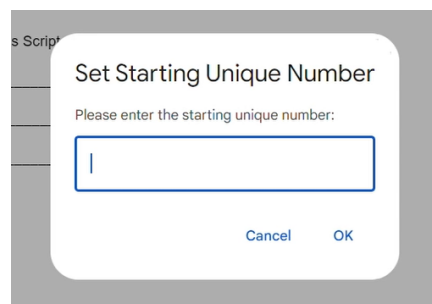
Introduction and Usage

The Question Paper Printing system is hosted on Google Docs and uses add-ons to make the printing process personalized and easy to print the sheets with a special unique ids. These unique id's get mapped to the students once they have given the test/quiz and will help in tracking the candidate throughout the entire evaluation process.

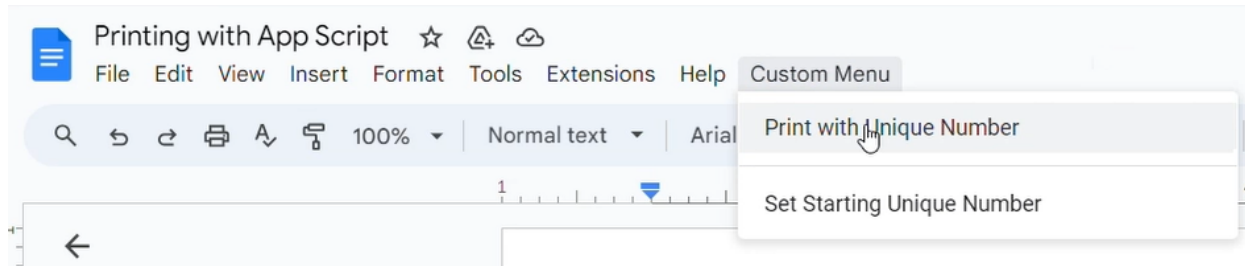
To start, we go to the Google Doc and make the question paper, giving the space required for writing the answers to the questions. Then we go to the **Custom Menu** → **Set Starting Unique Number**



This will open the dialogue box to enter the starting unique number for each student. This will increment automatically and only the first number is required to be entered.



Next, we need to go to the **Custom Menu** → **Print with Unique Number** to print the question paper sheets. These will be done in batches and each batch will have a different unique ID corresponding to the candidate.



PEER-EVALUATION SYSTEM

Introduction

The Pre-Evaluation steps should be run after the test has been taken and the scanned files are uploaded through the portal and the renaming of files is done and the files are in the folder in Google Drive. These scanned files are the answer scripts of the candidates.

Guide to Use

- **Registration & Login window: -**

For the registration window we have three fields that are Name, Email Id and Password. Once the fields are filled and we press the Register button, if the email id is valid the user will get the OTP through the email id and they can enter the one time password in the OTP field to verify their registration.

Note: - The password must be 8 characters long with a capital letter, small letter, a numerical digit and a special character out of the following characters “ @\$!%*?& ”.

The below are the steps to do the new user registration: -

Step 1: - Fill the details and press the “Register” button.

The screenshot shows a 'Register' form on a dark blue background. The form has two main sections. The top section contains fields for 'Name' (filled with 'Madhur Thareja'), 'Email ID' (filled with 'staff.madhur.thareja@iitrpr.ac.in'), and 'Password' (filled with '*****'). Below these is a blue 'Register' button and a green message box stating 'OTP has been sent to the staff.madhur.thareja@iitrpr.ac.in'. The bottom section contains an 'OTP' field (empty) and a blue 'Verify' button.

In the above window the OTP section of the form will be visible only if the OTP is sent successfully and then we can fill the OTP.

Step 2: - Check the email for the one time password (Spam also) and fill the one time password in the OTP field and press the “Verify” button.

This screenshot shows the same 'Register' form after the OTP has been entered. The 'OTP' field now contains the number '500109'. The blue 'Verify' button is still present. Below the OTP field, a green message box displays 'User registered successfully with role: Teacher'. The 'Register' button and the message about the OTP being sent are no longer visible.

After the above successful registration we can navigate to the Login page and can do the Login and we will get the dashboard as per the role which is assigned based on the email id.

Step 3: - Logging in to the portal.
Enter the details on to the portal as shown:

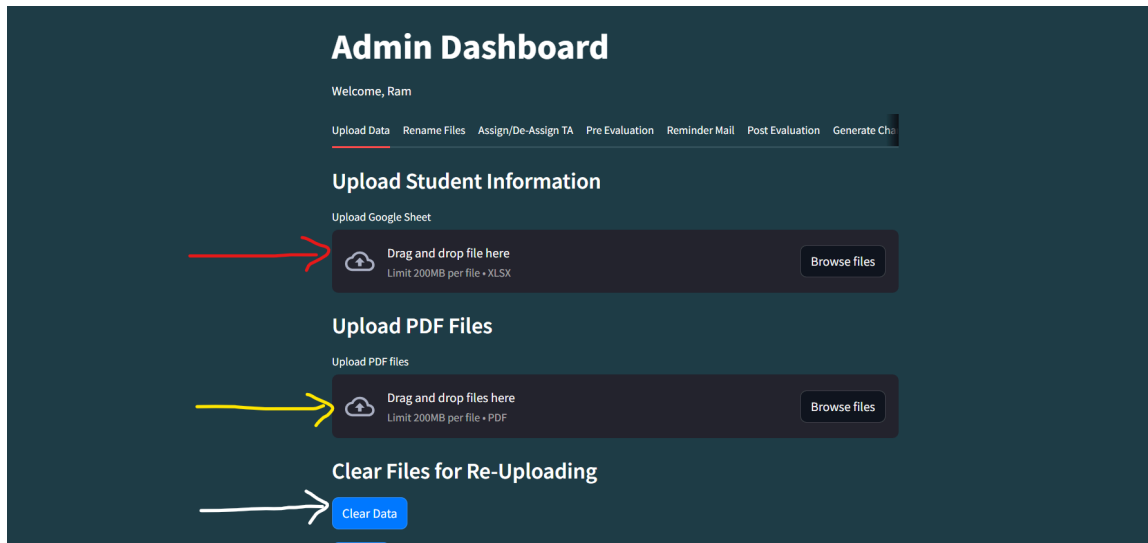
The screenshot shows the login interface of the Peer Evaluation System. At the top, the title "Peer Evaluation System" is displayed in white on a dark blue background. Below the title, there are links for "Login" and "Register". The "Login" section features a form with two input fields: "Email ID" containing the text "ram.24@iitrpr.ac.in" and "Password" containing eight asterisks. A blue "Login" button is positioned below the password field.

After the successful login we will be able to see the dashboard as per the role, here the Admin dashboard will be visible to us as we have logged in as the Admin.

The screenshot displays the Admin Dashboard. At the top, it says "Admin Dashboard" and "Welcome, Ram". A navigation bar includes links: "Upload Data", "Rename Files", "Assign/De-Assign TA", "Pre Evaluation", "Reminder Mail", "Post Evaluation", and "Generate Chart". The "Upload Data" link is highlighted. Below this, the "Upload Student Information" section has a sub-label "Upload Google Sheet" and a file upload area with a cloud icon, the text "Drag and drop file here", "Limit 200MB per file • XLSX", and a "Browse files" button. The "Upload PDF Files" section has a sub-label "Upload PDF files" and a similar file upload area with the text "Limit 200MB per file • PDF". At the bottom, there is a "Clear Files for Re-Uploading" section with a blue "Clear Data" button.

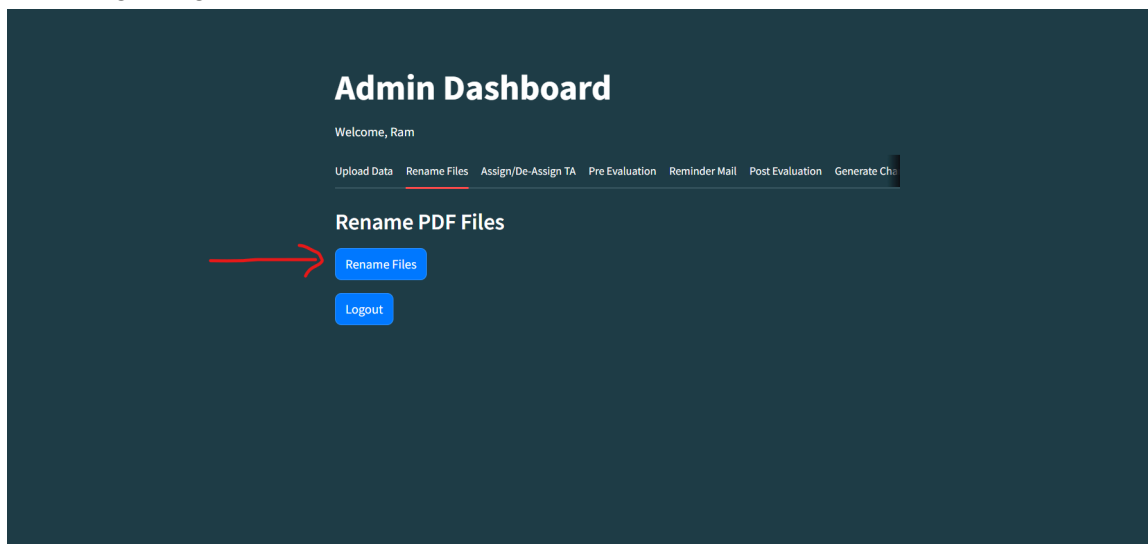
- **File Upload window: -**

1. Use the "Upload Student Information" uploader depicted with red arrow, for uploading the sheet consisting of the mapped email id with the unique id.
2. Use the "Upload PDF Files" uploader depicted with yellow arrow, for uploading the scanned answer sheets.
3. Use the "Clear Data" button depicted with white arrow for deleting all files in case of an error or problem.



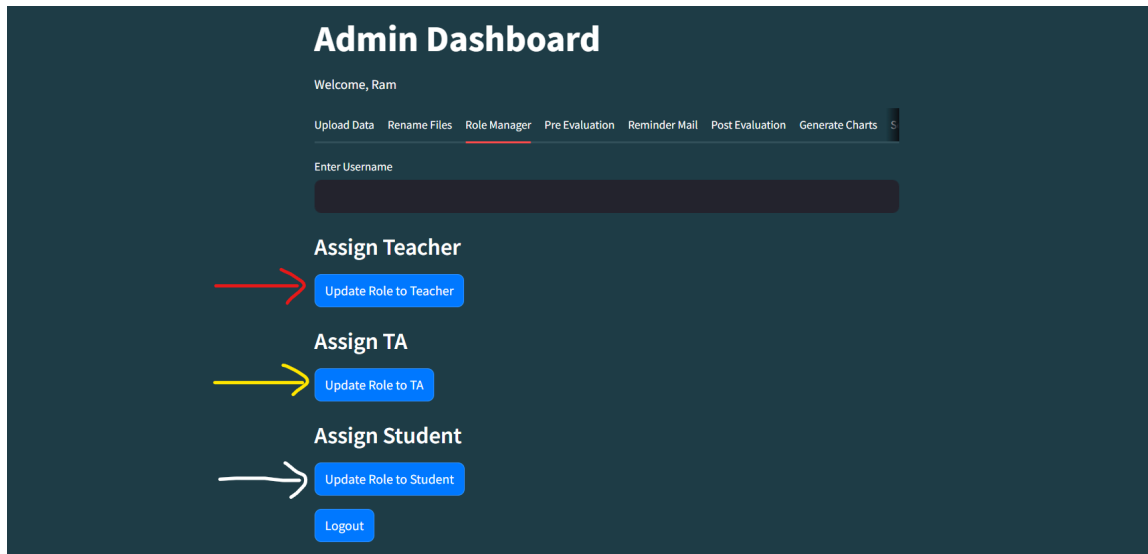
- **Rename Files window: -**

After uploading the files successfully, now we are ready to rename the uploaded files (can be done using the “Rename Files” button depicted with red arrow) according to the assigned unique id which is present in the top left corner of the pdf files which we are extracting using the OCR technique.



- **Role Manager window: -**

If Admin or a teacher wants to assign a user a different role than they can use the below window. After entering the username the teacher can use the button as per the requirement and can assign a student to/from the TA duty. Also if we want to make any Teacher a student due to any reason we can do it from the Admin’s I’d. The button depicted with the red arrow helps to assign the “Teacher” role and the button depicted with the yellow arrow is to assign the TA role. The button depicted with the white arrow is for assigning the user a Student role.

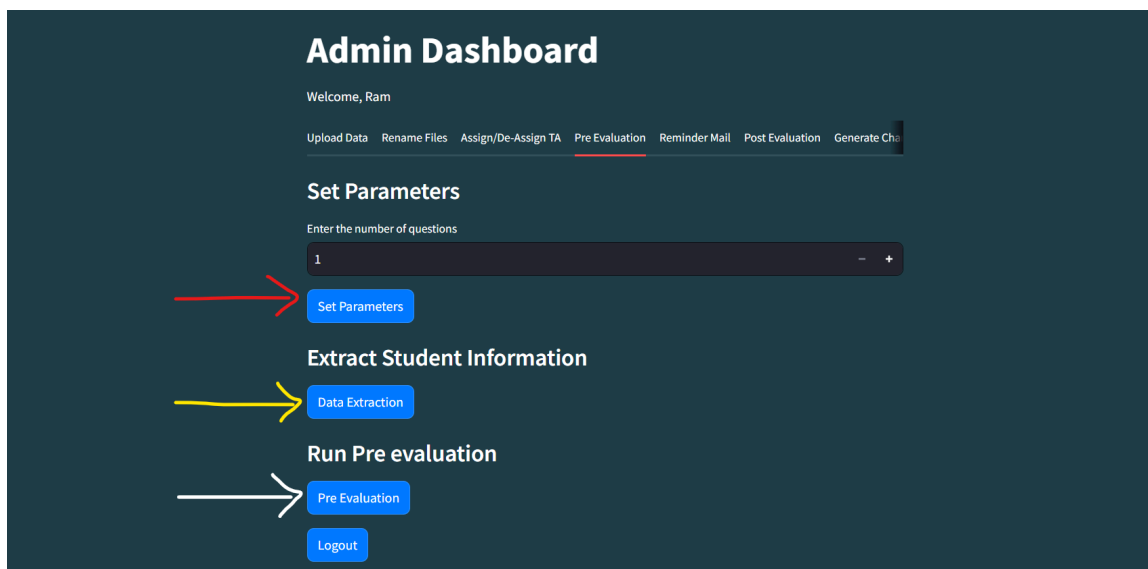


- **Pre Evaluation window: -**

The Set Parameter section which has the field for the number of questions and a “Set Parameters” button (depicted with red arrow) will help the user to set the number of questions that are there in the current quiz/test.

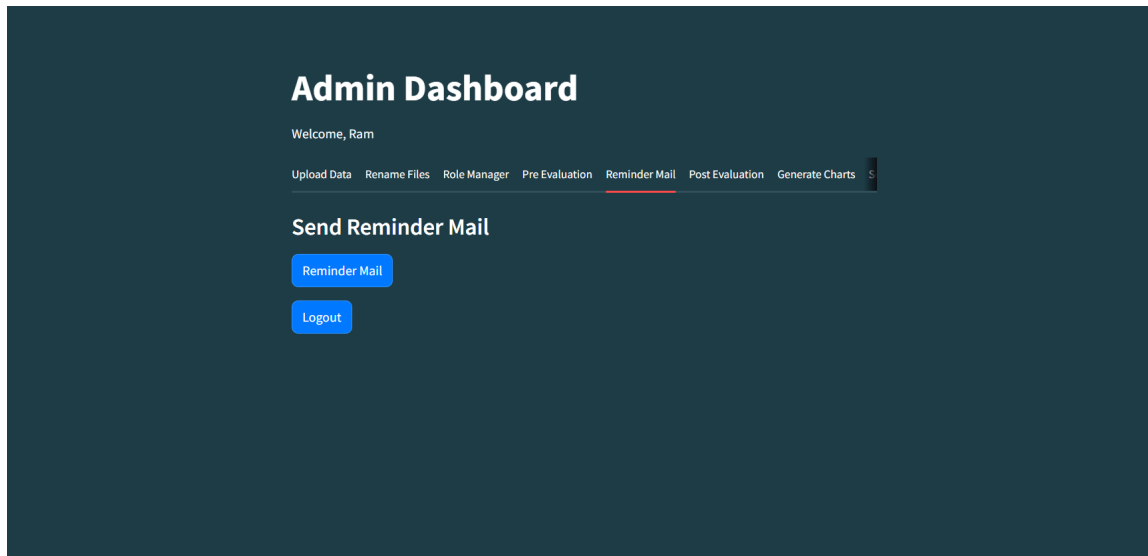
The “Data Extraction” button (depicted with yellow arrow) will extract all the information of the students from the uploaded sheet to the main processing sheet and will clear the uploaded sheet from the folder to optimize the space.

The “Pre Evaluation” button (depicted with white arrow) will assign all the data to the student to evaluate and they will be able to see the sheets that they are going to evaluate.



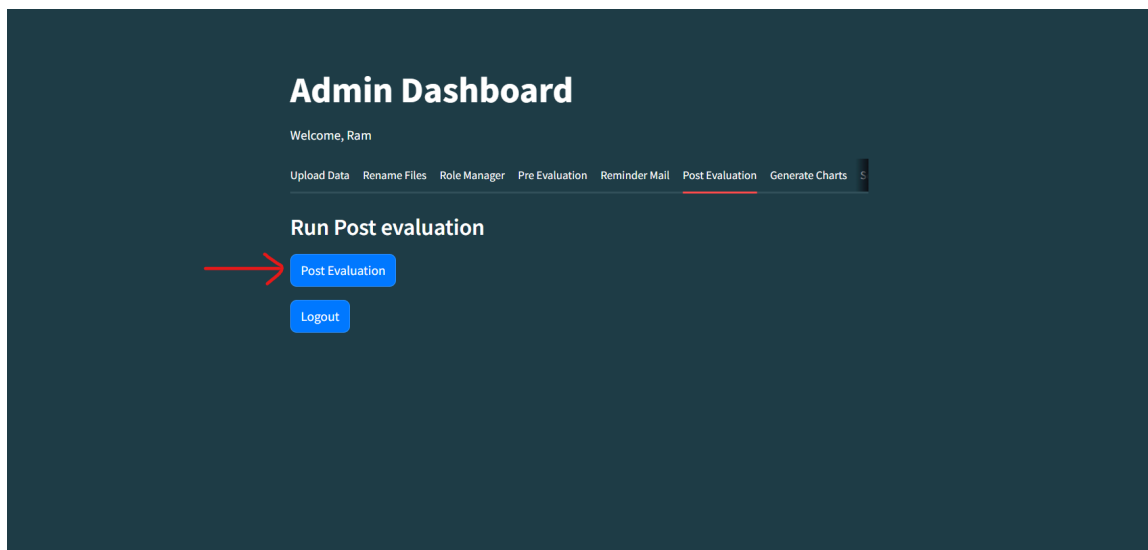
- **Reminder Mail window: -**

The “Reminder Mail” button will help the Teacher and TA to send a reminder to all those students who haven’t done the evaluation till now.



- **Post Evaluation window: -**

The “Post Evaluation” button depicted with a red arrow helps Teachers and TA’s to consolidate the marks of the student at one place and this helps further in releasing of the marks.



- **Generate Charts window: -**

The “Generate Charts” button depicted with a red arrow helps Teachers and TA’s to visualise the plots of the average marks and standard deviation of the students.

Admin Dashboard

Welcome, Ram

[Upload Data](#) [Rename Files](#) [Role Manager](#) [Pre Evaluation](#) [Reminder Mail](#) [Post Evaluation](#) [Generate Charts](#) [S](#)

View Average and SD chart

[Generate Charts](#)

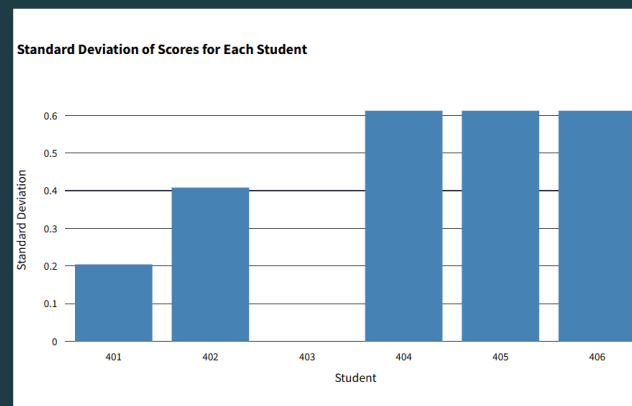
[Logout](#)

Welcome, Ram

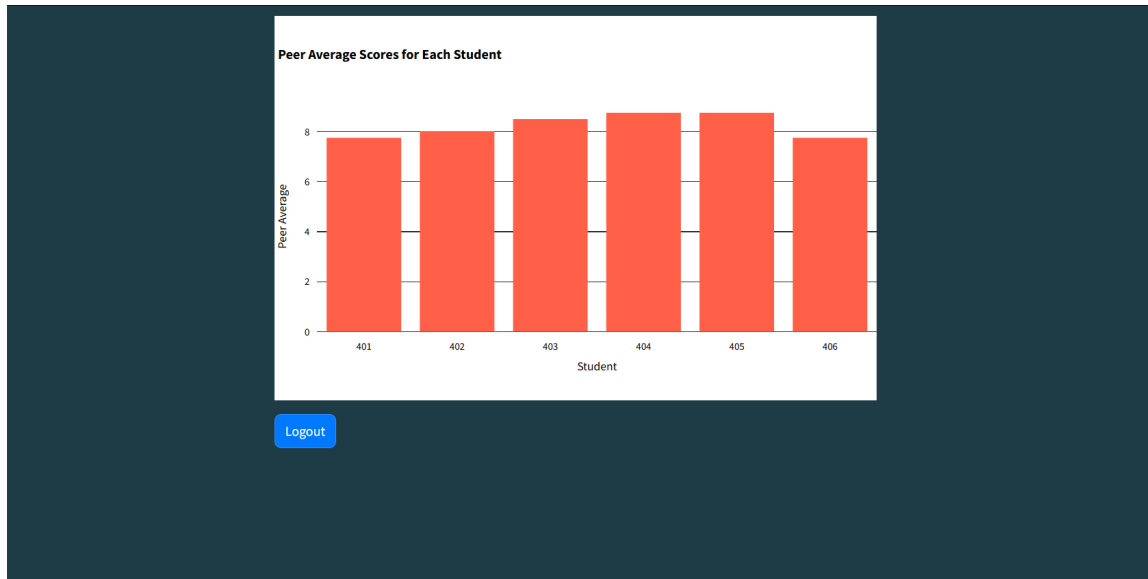
[Upload Data](#) [Rename Files](#) [Role Manager](#) [Pre Evaluation](#) [Reminder Mail](#) [Post Evaluation](#) [Generate Charts](#) [S](#)

View Average and SD chart

[Generate Charts](#)



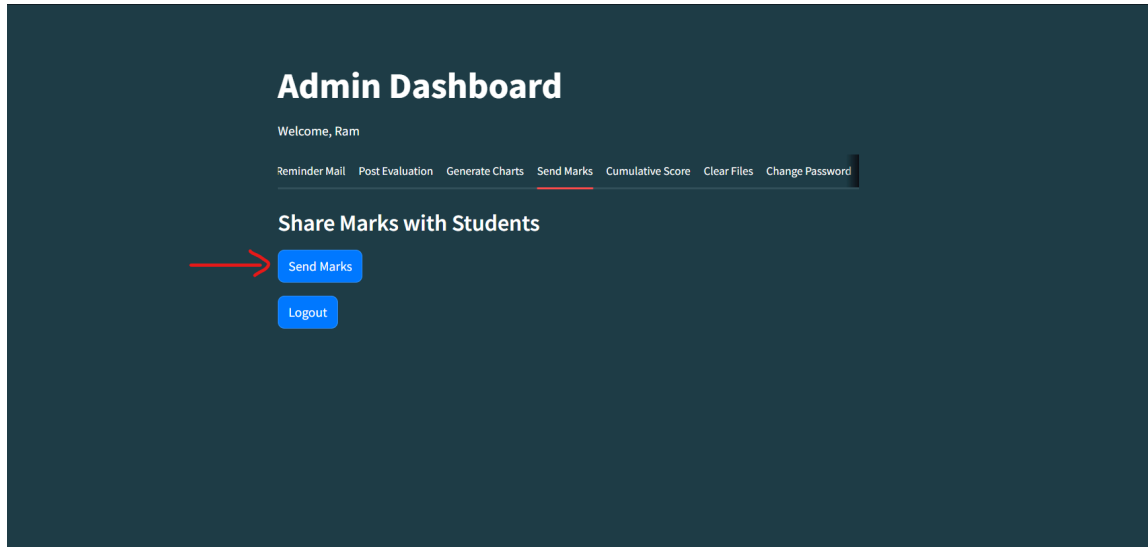
The above plot shows the standard deviation of each student. We can use the above plot for visualizing the standard deviation of average marks among all students.



The above plot shows the average marks of each student. We can use the above plot for visualizing the average marks of each student and we can see how the students are performing in the class.

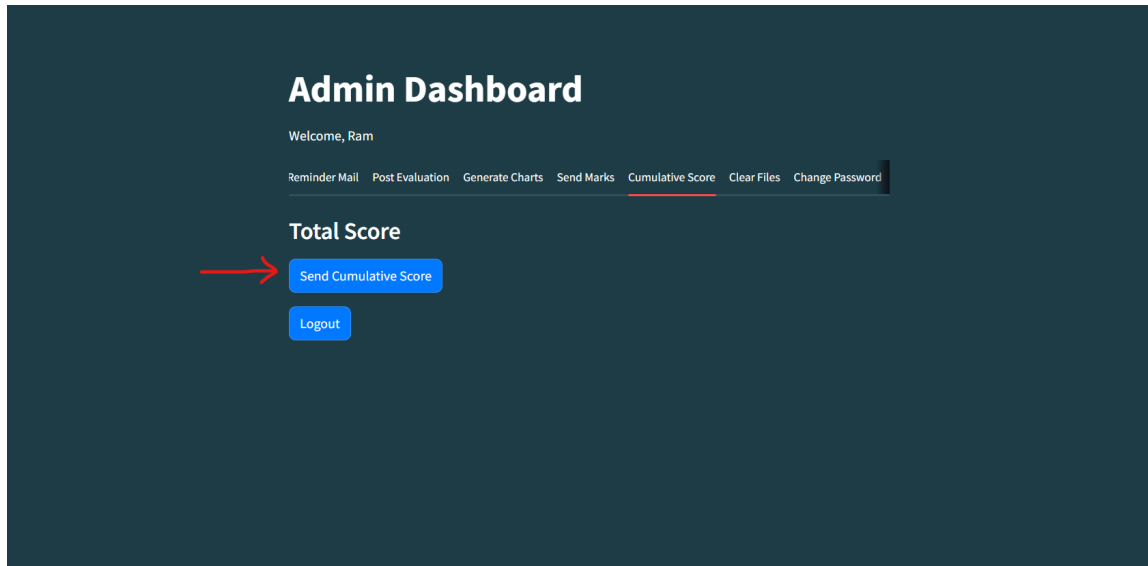
- **Send Marks window: -**

The “Send Marks” button depicted with a red arrow helps Teachers and TA's to release the Quiz/Test marks to the students.



- **Cumulative Score window: -**

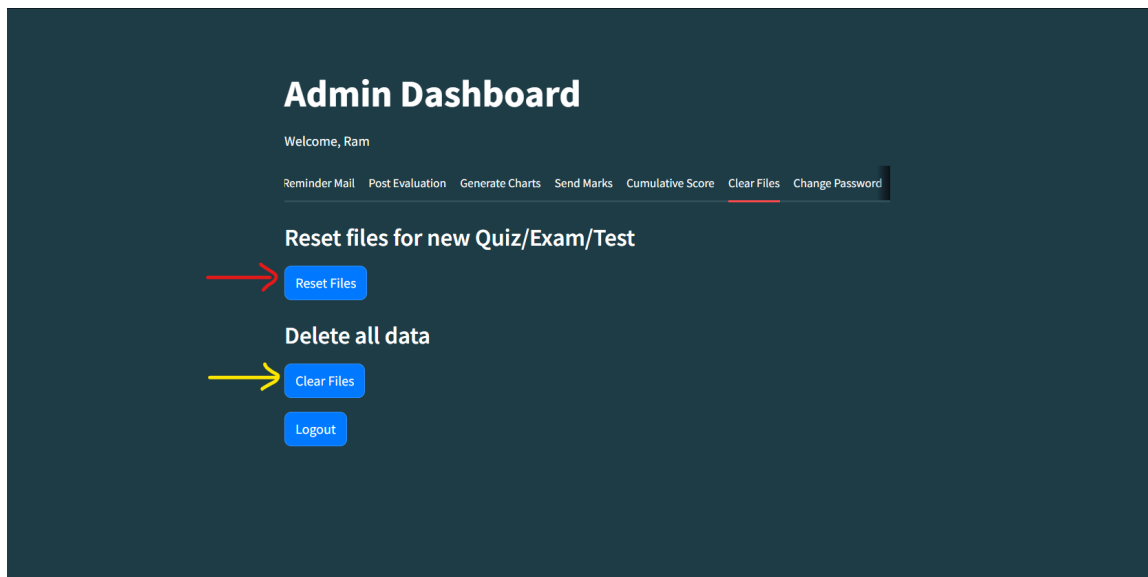
The “Send Cumulative Score” button depicted with a red arrow will help the Teachers and TA's to send the total marks of the students scored in the subject. (We assume that the scaling is done explicitly).



- **Clear Files window: -**

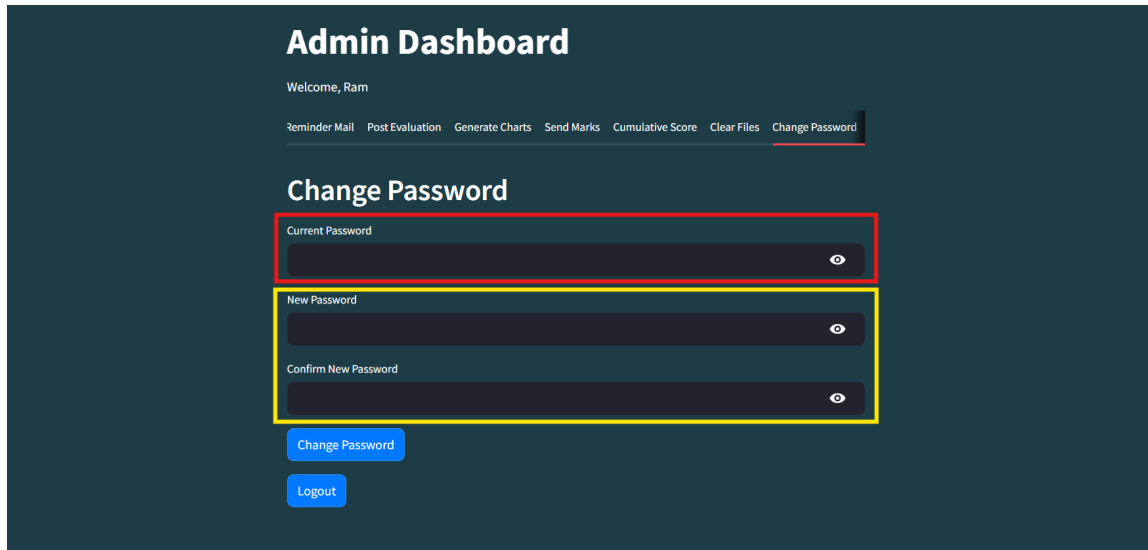
The “Reset Files” button depicted with a red arrow will help the Teachers and TA’s to clear the files/backend data. This is provided as a precautionary measure and the script is already handling the clearing of the files.

The “Clear Files” button depicted with a yellow arrow will help the Teachers and TA’s to clear all data including the sheets which is serving as the backend for our system. It is serving as the reboot to our evaluation system.



- **Change Password window: -**

The “Change Password” functionality has three input fields, the first field depicted with red box takes the current password of the user and the other two fields depicted with yellow box are taking the new password and confirmation for the new password, if both matches the password get changed in the server.

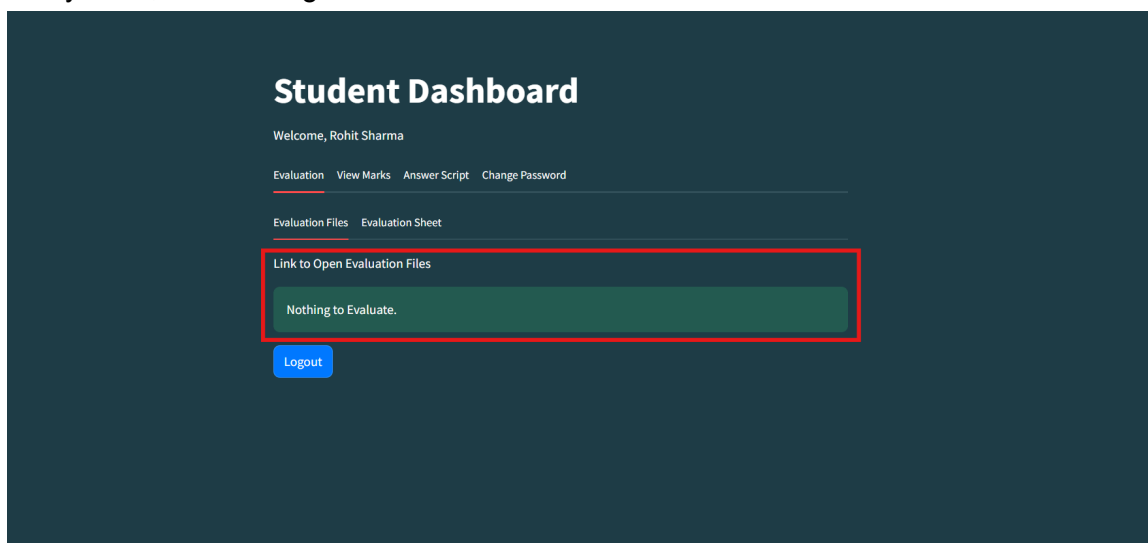


The image shows the 'Admin Dashboard' interface. At the top, it says 'Welcome, Ram'. Below this is a navigation bar with links: 'Reminder Mail', 'Post Evaluation', 'Generate Charts', 'Send Marks', 'Cumulative Score', 'Clear Files', and 'Change Password'. The 'Change Password' link is highlighted. The main section is titled 'Change Password' and contains three input fields: 'Current Password', 'New Password', and 'Confirm New Password'. Each field has a toggle icon (an eye) to the right. The 'Current Password' field is highlighted with a red border, and the 'New Password' and 'Confirm New Password' fields are highlighted with a yellow border. Below the input fields are two buttons: 'Change Password' and 'Logout'.

The above whole step by step guide is similar for the Admin, Teacher and TA dashboard. For depiction the Admin dashboard is used because it has all the functionalities from all the three dashboards. The other two dashboards have limited functionality according to the roles. For example the Upload file option is not provided to the teacher because the TA's will do that for them and the functionality like Role Manager is not given to the TA's because we want that only Teacher or Admin can do changes to the roles of the user's. The Admin has the access to make somebody as the Teacher (if we want to make somebody as a teacher who is not entitled to be the teacher for the course), because this is a very crucial role we are not giving it's control to the Teacher's even.

- **Student dashboard (Evaluation) window: -**

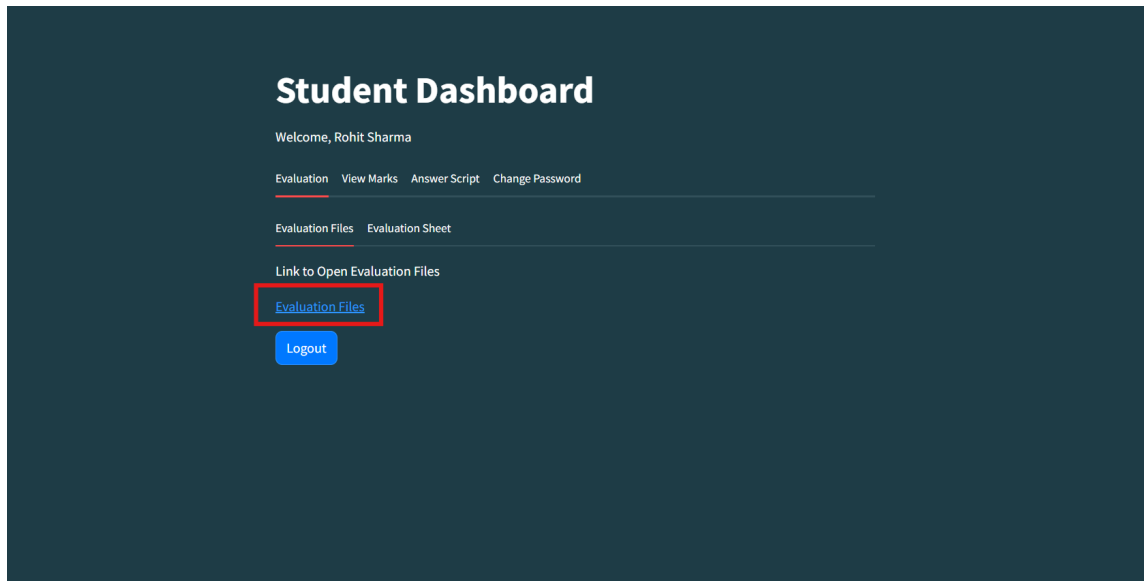
The student dashboard will give the below message if there is nothing to evaluate for a student. The message for the “Evaluation Files” window is depicted with the red box for clarity. Also, the message for the “Evaluation Sheet” window would be the same.



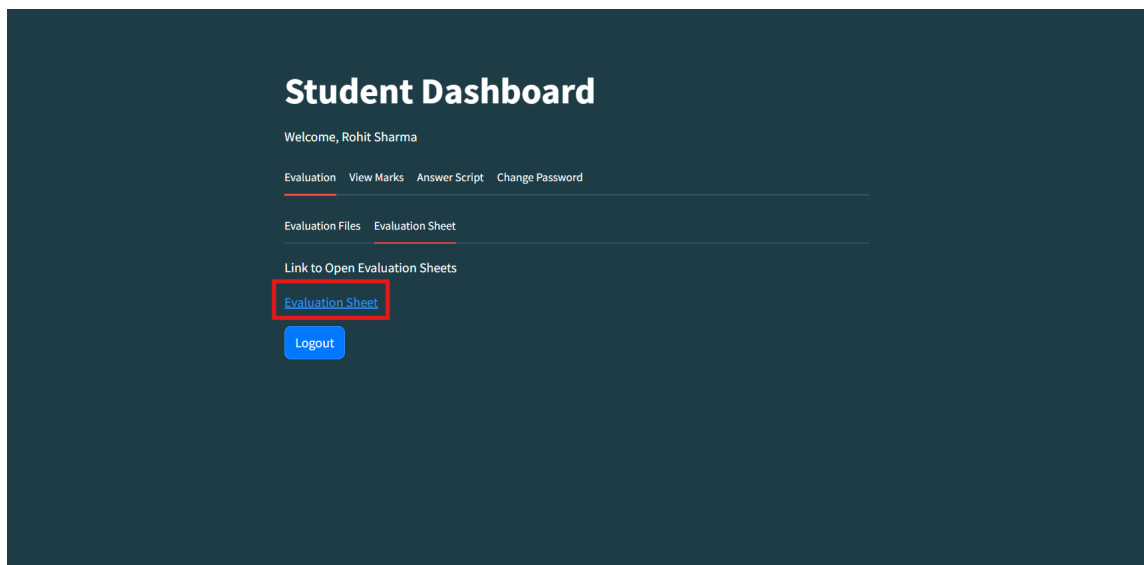
The image shows the 'Student Dashboard' interface. At the top, it says 'Welcome, Rohit Sharma'. Below this is a navigation bar with links: 'Evaluation', 'View Marks', 'Answer Script', and 'Change Password'. The 'Evaluation' link is highlighted. Below this is another navigation bar with links: 'Evaluation Files' and 'Evaluation Sheet'. The 'Evaluation Files' link is highlighted. The main section is titled 'Link to Open Evaluation Files' and contains a message: 'Nothing to Evaluate.' The message is highlighted with a red border. Below the message is a 'Logout' button.

If there is something to evaluate for the student then they will get the link under the “Evaluation Files” section and when they click the link, a google drive folder will appear in a new tab of the browser and they will be able to see all the files they need to evaluate. Also, for the “Evaluation Sheet” a link will appear and they will be able to open a sheet where they can update the marks of the assigned students or peer’s.

The sample screenshot for the above all functionalities are attached below: -

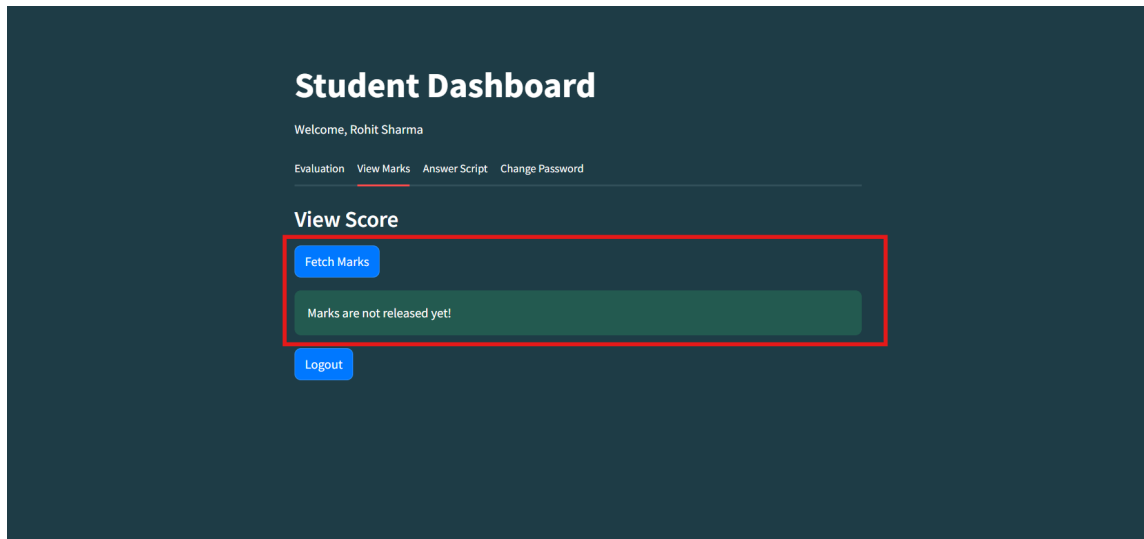


In the above screenshot we can clearly see that the “Evaluation Files” link is available and the student can use the link to open the files that he needs to evaluate.

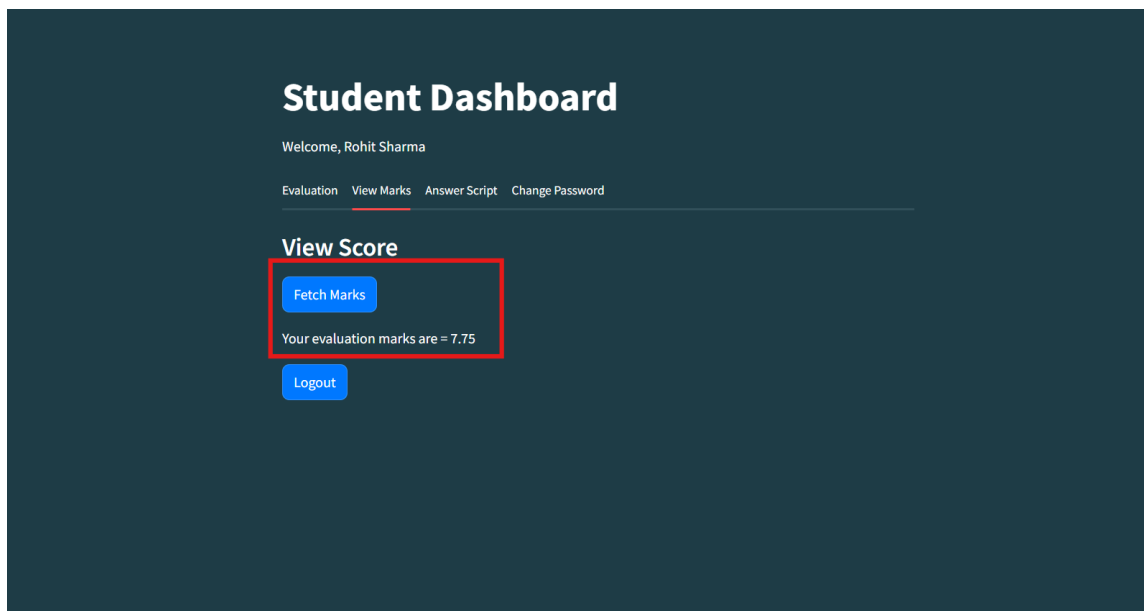


In the above screenshot we can see that the “Evaluation Sheet” link is available and the student can use the link to open the sheet in which he has to update the marks of their peers.

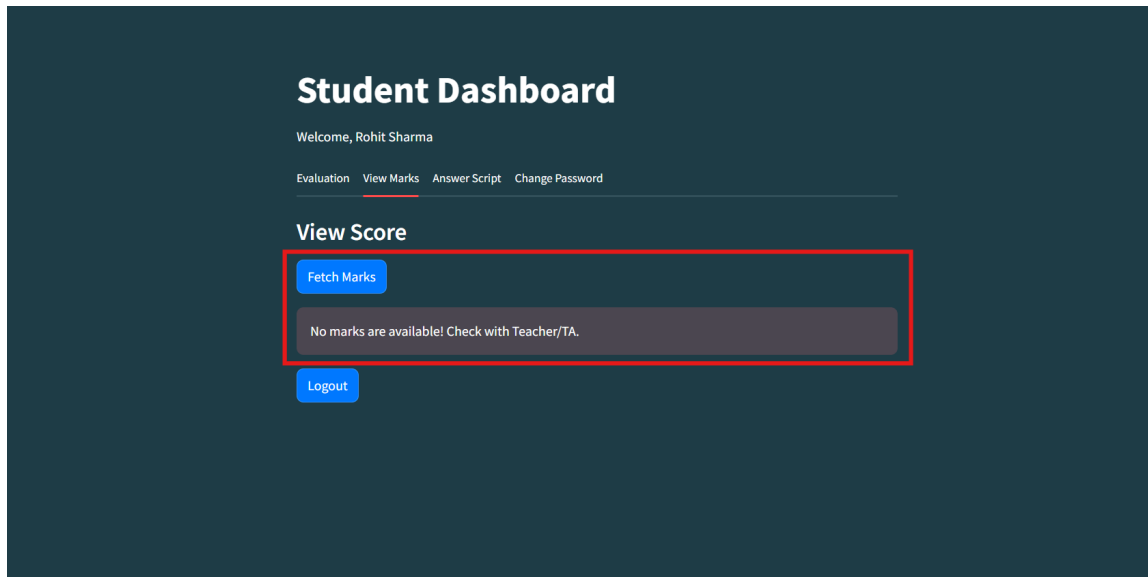
- **Student dashboard (View Marks) window: -**



The “Fetch Marks” button on the View Marks window will help the student to view their marks for the current Quiz/Test. If the marks are not released yet then they will get the above message on their portal.

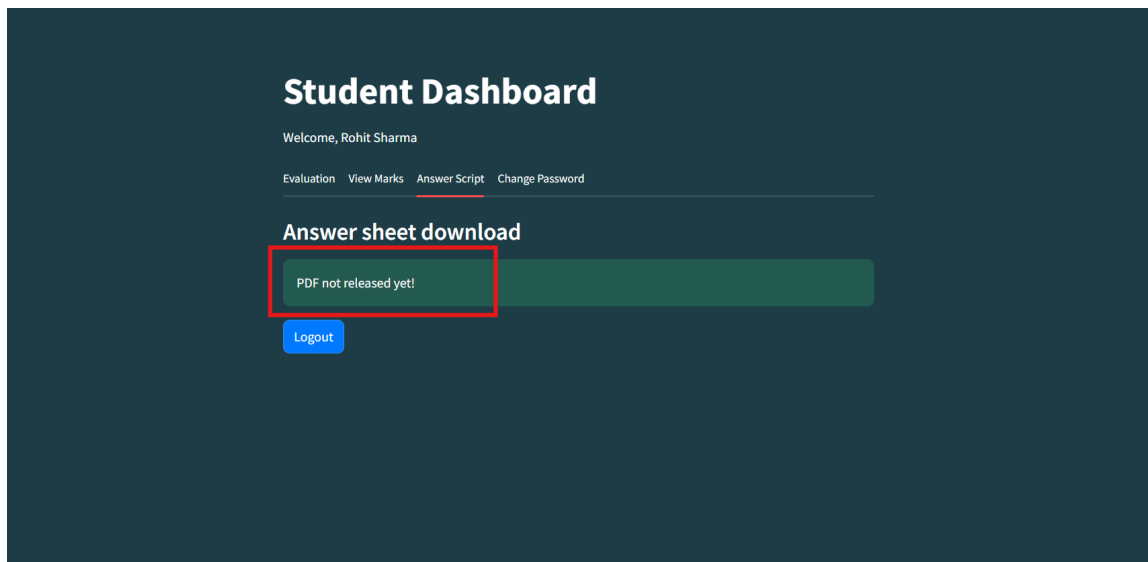


If the marks are released and available for the students, then they can see their marks with a display message as shown above.

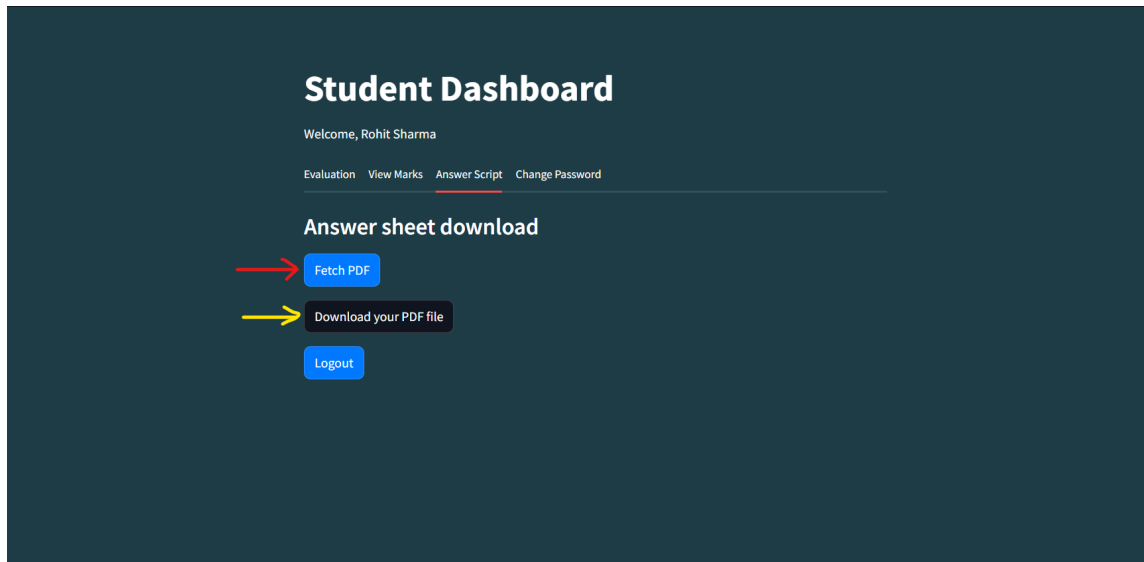


If the marks are released but the marks are not available for the students, then they will see the above message which asks them to get in touch with the teacher or TA of the subject.

- **Student dashboard (Answer Script) window: -**



If the Answer sheet is not released that means the evaluation is still pending then the students will see the above message which says “PDF not released yet!”.



If the Answer sheet is available, that is the evaluation is done, then they can use the “Fetch PDF” button depicted with red arrow to get the “Download your PDF File” option depicted with yellow arrow. Using the above “Download your PDF File” option the student can download their Answer scripts and can view them.

The “Change Password” functionality is the same for all the users and the students can read the instructions for password change from the above “Change Password window” section of the instructions.

REPLICATION

If we want to store the data from the previous test we need to save the copy of the target folder from the administrator side to the different google drive folder in order to clear the data and run the portal for new data.