Mathenian: A Practice App for Mathematics

Mathenian, a current placeholder name, is a mobile application designed to help users improve upon their mathematical skills through practice questions. The main audience for this app will be the general adult population from 18 and up tailored to anyone who wants to continue improving upon or maintain their skills in mathematics.

The mathematical topics covered in this app will be Arithmetic, Algebra, Geometry, Set Theory, Calculus, Probability, and Statistics. Each topic will have its own lesson except for Calculus which will be broken down into smaller subsets of the topic. The topic of Calculus will be split into Limit Theory, Differential Calculus, and Integral Calculus.

Each topic will feature an introductory lesson which will give a basic outline of the topic and the possible type of questions to expect. After this introductory lesson, the user will then be given a series of 10 problems to solve with no time limit. The lessons will neither include a calculator or a space for scratch work and as such, the difficulty of the questions will be easy enough to be answered without them. The types and values of these problems will be randomly selected from a pool of existing questions. There will be a progress bar to track the number of correct answers in that specific lesson. Each lesson is repeatable to ensure that users can continually practice.

Answering all questions correctly in a lesson will improve mastery of the lesson by 25%. Not answering all questions correctly in a certain lesson will reduce the amount of mastery gained. A user can exit out of a lesson at any time but will have no gain in mastery. Each lesson can be tested out of with a test consisting of 25 questions where a user must answer at least 23 questions correctly. Lessons will be separated into a hierarchal structure (See page 2). There will be different tiers of mastery, starting at Bronze, Silver, Gold, and Diamond. Each subsequent tier will give users more complex questions. A user is only required to master the Bronze level before being allowed to continue onto further topics. If a user finishes all topics, all lessons will still be open for practice thereafter.

Users will be able to log in which allows the app to track their current progress through the various lessons. The app will track the ‘number of questions completed daily’, ‘daily streak’, and ‘total number of questions answered correctly’ metric to show user progress. User progress will be shown in a profile page for the user. The app will also keep track of averages between all users. This will consist of ‘average number of correct answers’ in each specific lesson, and ‘percentile of users who have reached this lesson’. These averages will be shown within each specific lesson for a specific mastery. These averages will not be updated if a user quits the lesson early. The app will not have any nor require any monetary services. The mobile application will work on both Android and iOS compatible systems.

Appendix A