

Matrix Specification

App Name: Matrix - A Math Worksheet Generator

Specification

We want to develop an app that allows the user to generate and print out pseudo randomized math questions as a customized worksheet. The math questions will be at an elementary school level from various subtopics; such as addition, subtraction, multiplication, division, and least common multiple to name a few.

Each worksheet will be highly customizable; allowing users to choose their desired topic (and subtopic), difficulty level (easy, medium, or hard), number of questions, and the format of the question (horizontal or vertical view). Furthermore, users will have the ability to choose formatting details including worksheet title, instructor name, and font size. Once the user generates the worksheet, a single local PDF of the worksheet will be created, including an answer sheet on a separate page. The user will also have the ability to save and download this PDF. Finally, the app will store each user's information, such as personal details, user history (ex. parameters of previous worksheets created), and user scores (which can be inputted by the user).

Example UI on the next page.

Home Screen

Home Screen UI: A login/register page for 'Matrix A Math Worksheet Generator'. It features a title, a 'Log in' button (highlighted in yellow), and a 'Register' button. Input fields for 'Username' and 'Password' are present.

User Menu UI: A page with a 'Back' button and a 'Profile' icon. It contains two buttons: 'Start New Worksheet' (blue border) and 'User History' (pink border).

Choose Topic UI: A page with a 'Back' button and a 'Profile' icon. It lists five topics: 'Addition', 'Subtraction', 'Division', 'Multiplication', and 'LCM', each with a difficulty icon. A tooltip indicates that the selected topic will include user details, user scores, and user history.

Each Topic will have an additional page with subtopics

Addition Subtopics UI: A page with a 'Back' button and a 'Profile' icon. It lists subtopics for 'Addition': 'Standard', 'Fraction', 'Pictures', and an ellipsis. A tooltip for 'Standard' indicates an example grade level.

There will be difficulty options

Difficulty Options UI: A page with a 'Back' button and a 'Profile' icon. It shows three difficulty levels: 'Easy' (green border), 'Medium' (blue border), and 'Hard' (red border). A tooltip for 'Easy' explains that for example, easy addition would have 1 number.

Worksheet Customization UI: A page with a 'Back' button and a 'Profile' icon. It includes fields for 'Title', 'Number of Questions', 'Font Size', and 'Question Format'. The 'Question Format' dropdown is open, showing 'Horizontal' and 'Vertical' options. At the bottom are buttons for 'Generate Worksheet' (blue border), 'Preview', 'Download' (yellow border), and 'Use Default Settings' (purple border).

Supplementary information

Horizontal question format: $34 + 21 = \underline{\quad}$

Vertical question format:
$$\begin{array}{r} 34 \\ + 21 \\ \hline \end{array}$$

Standard question type = integers only

Fraction question type = fractions only