**Smart Math – Android App**

**Project Domain / Category**

Mobile Apps

**Abstract / Introduction**

Math is one of the hardest subjects in educational institutes, which is why owning a scientific calculator seems like a necessity for students. But what if one could use smart phone to solve equations by pointing camera at the problem in textbook instead of using a calculator? That is the basic idea behind a Math solving smart phone app.

**Smart Math** is an Android based mobile application that can read and solve mathematical expressions using smartphone camera in real time. It provides a step-by-step guide showing how each of the problems is solved, which is beneficial to students that do not have access to a tutor or struggle with solving math problems. Parents, as well, can use this app to jog their memory when teaching math to their kids.

**Functional Requirements:**

The functional requirements are as follows;

1. Completely offline app, i.e. no Internet Connection needed.
2. The app should provide solution to Math problems on basis of following three modes;

* **Camera Mode:** Point camera towards a Math problem and show the result instantly.
* **Photo Mode:** Browse a photo from SD Card, fetch expression and solve it.
* **Written Mode:** Write expression in an editing text field (*i.e. Text View / Text Area*) and evaluate it.

1. It can solve simple as well as complex Math problems, like; Arithmetic, Integers, Fractions, Decimal Numbers, Roots, Algebraic Expressions, Linear & Quadratic Equations, Derivatives and Integrals etc.
2. It should provide complete step-by-step explanation to solutions.
3. Calculation history should be maintained by storing all problems along with their solutions in internal database (*i.e. SQLite*);
4. The app should display all history (i.e. saved problems & solutions) in ascending or descending order on the basis of their titles or created dates.
5. User should be able to add custom title/note to any saved record.
6. User should be fascinated by giving basic features like search, copy, edit, delete and share problems and their solutions.
7. The app should be customizable by changing syntax style, text colour and font size etc.
8. Permissions for accessing device camera and read/write SD Card contents should be granted at appropriate actions.

**Note:** This project requires proper understanding of **Optical Character Recognition (OCR)** technique and its implementations. For more about OCR, visit;

<https://en.wikipedia.org/wiki/Optical_character_recognition>

<https://techterms.com/definition/ocr>

**Tools:**

1. **IDE:** Android Studio

2. **Programming language:** Java

3. **Database:** SQLite

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