MathEasy

http://webstarts.com/matheasy/

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Motivation

- The biggest challenge in mobile computing is to build applications that are acceptable across all geographical regions in language independent manner.
- Our motivation was to provide a language independent mathematics quiz for students which will act as supplement to their studies and add fun to learning.

Target Audience

- Children of age groups 6-10 years which will use the mobile application to learn addition and subtraction.

- This is in fulfillment of coursework for CSE 594 - Mobile Computing for informal economies.

Application Functionality

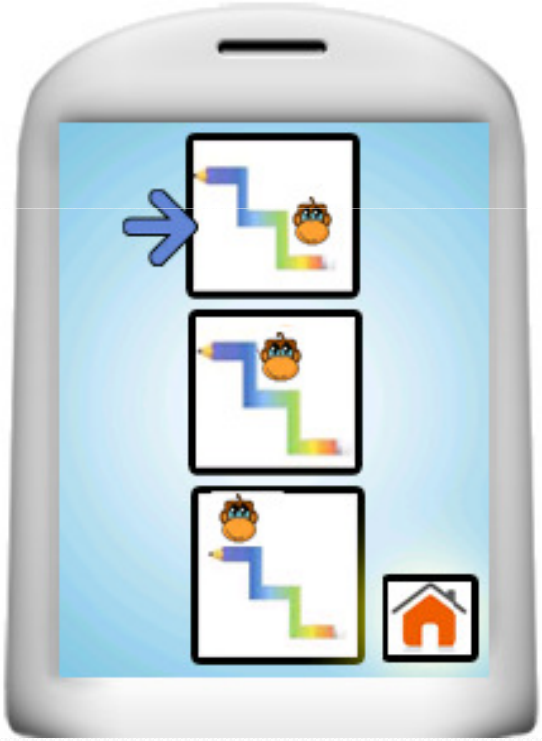
- The application generates random questions on simple addition and subtraction. It has three difficulty levels and enables the user to select a difficulty level according to his preference.
  - Easy: Single digit addition and subtraction
  - Medium: Two digit addition and subtraction
  - Hard: Three digit addition and subtraction

Design: User Interface

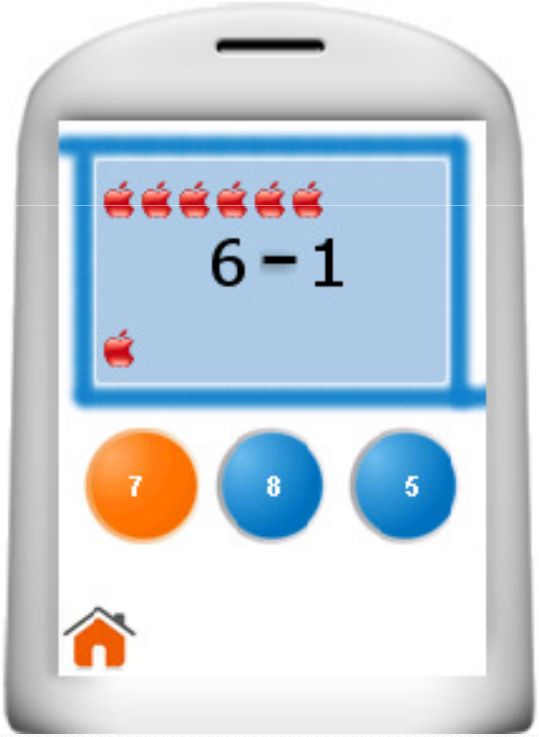
- User interface includes:
  - Main Screen
  - Difficulty Selection Screen
  - Questions and Options
  - Wrong Answer Screen
  - Score Report

Application Flow – Easy level

Main Screen

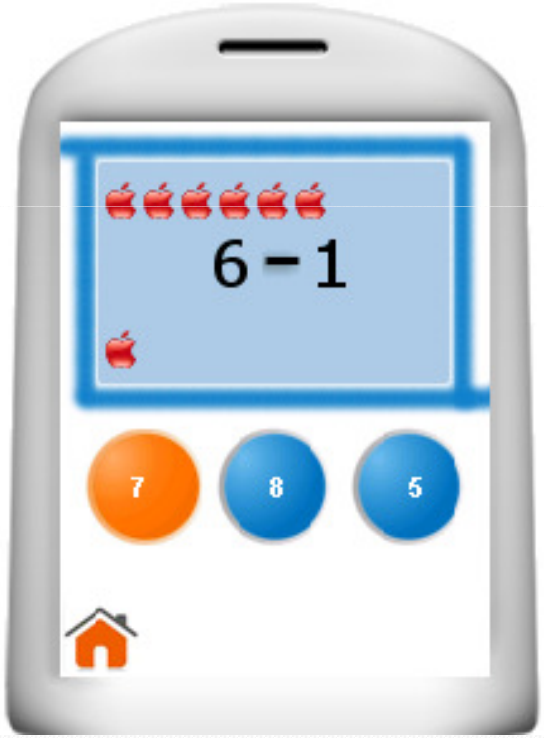


Difficulty Level



Question Screen

Application Flow – Option Selection



No Selection
(Highlighted in Orange)

Wrong Answer
(Highlighted in Red)

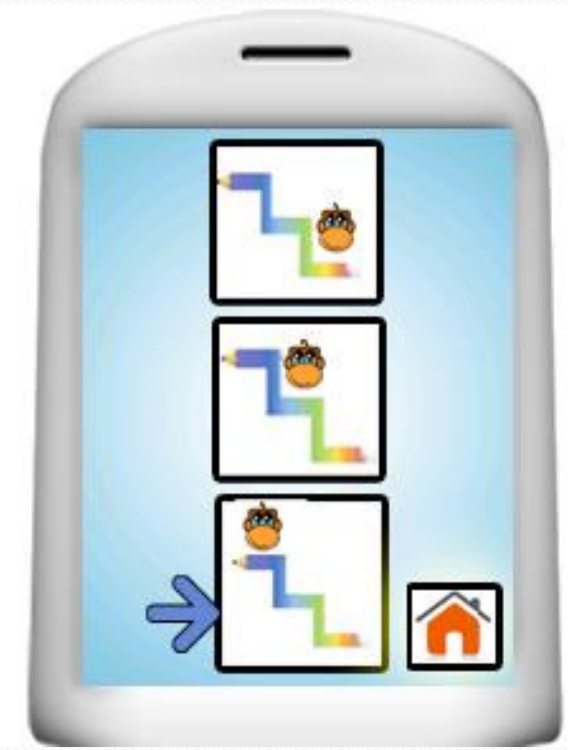
Right Answer
(Highlighted in Green)

Application Flow – Medium Level

Difficulty Level

Question Screen

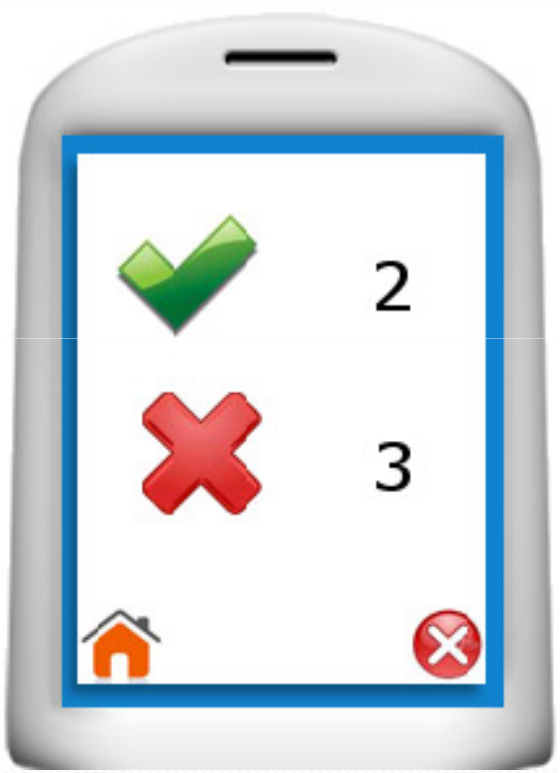
Application Flow – Hard Level



Difficulty Level

Question Screen

Application Flow



Score Report

Application Organization & Technical Components

- The application is designed using J2ME MIDLET.
- For development of the MIDLET, NetBeans package was used.
- Being a mathematical quiz the questions were generated on the fly so there is no need for any database or maintaining question bank.

Application Organization & Technical Components

- The questions are generated using the nextInt() functions of “java.util.Radom” Class.
- Depending on the current difficulty level we make the nextInt() function generate the questions. For example Easy level it generates only single digit questions.
- The application also make use of a open source helper function called resizeImage which will resize the images according to screen size.

Application Organization & Technical Components

- The coordinates for placing the images have been specified relative to the screen size.
- Doing so makes the application adapt its layout to match the screen sizes of various mobile phones
- The application gets the input from the user through the keyPressed() event of the canvas class.
- The direction keys of a phone are used for selection of the options.

Application Organization & Technical Components

- Application was developed in CLDC-1.0 / MIDP-2.0 platform type.
- **Application Size :** 173 KB

Design: Integration with Mobile

- The application has been integrated to a low end phone “w350i” of make Sony Ericsson for our initial testing.
- The application was also tested on “Nokia E71” to check its user-interface and portability across mobile phones.

Integration Testing

- The flow of the application was tested with various test cases For example
  - Easy Level : Selection of Wrong answer
  - EasyLevel : Selection of Correct answer
- The above cases were tested for both Medium and Difficult level.
- The application was tested for above with the following mobiles:
  - Sony Erricson w350i (Lower end model)
  - Nokia E71 (Higher end model)

THANK YOU

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