Rocket Math

Rashne Hassan, Morgan Weaver, Hugrun Helgadottir, Ella Hedman

Goal/ Motivation

- Fun math game
    - Multiple choice option (buttons on fpga) (easy mode)
    - Type option (keyboard) (hard mode)
    - 3 lives
- Real World Application
    - Teaching grade school students simple math problems and a fun way to practice them

Functionality

- The game will have 2 modes, an easy and hard mode
  - The easy mode will have multiple choice problems, using the buttons on the FPGA to select the right answer
  - The hard mode will have blanks for the player to type in the answer, using the lab computer keyboard
- The player will get 3 lives, and the game will end when 3 incorrect answers have been entered, or the middle button is pushed to reset the program
- The score is based on how long it takes to answer the question
- As the player gets more points, the time limit to answer the question will get shorter and the questions get harder
- The score and time will display on the FPGA seven segment displays and the lives will be displayed using LEDs

Rocket Math

Select Mode:

Instructions:

Easy

Hard

Here

Rocket Math

Easy

Equation:

Equation:

1

2   Restart   3

4

Rocket Math

Hard

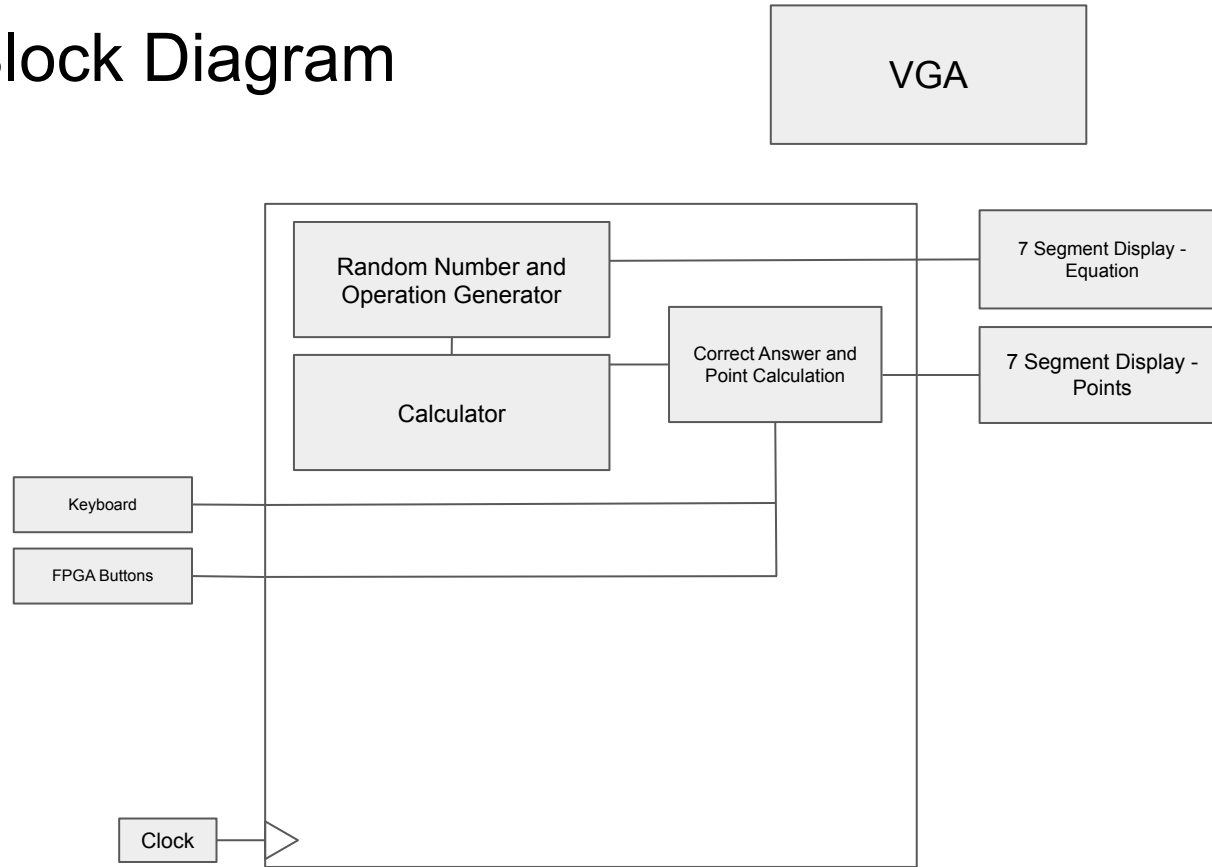Answer:

Equation:

_____

Specification

Project Description for Keyboard Games : create games you can play via a keyboard. These should include scores, levels, progressive difficulty, host computer visualization, etc

Our Implementation:

- Keyboard is the user input when on difficult level
- Score based on speed of answering the question and displayed on FPGA
- 2 Levels - Multiple choice (easy), typing answer (difficult)
- Progressive Difficulty with the time limit on answering questions
- Host computer visualization using the VGA (images shown on previous slides)

Detailed Block Diagram

VGA

Random Number and Operation Generator

7 Segment Display - Equation

Calculator

Correct Answer and Point Calculation

7 Segment Display - Points

Keyboard

FPGA Buttons

Clock

Code

Success

Failures