Portable Digital Reviewer

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Education

Introduction

In order to prepare students for the upcoming examination, it is essential for them to continuously study and review different topics from different subjects. And with the emergence of the internet, everything is readily available online. However, one of the challenges in this country is the lack of internet connectivity in far flung areas. Hence, this project intends to eliminate that problem by developing a portable digital reviewer.

Objective

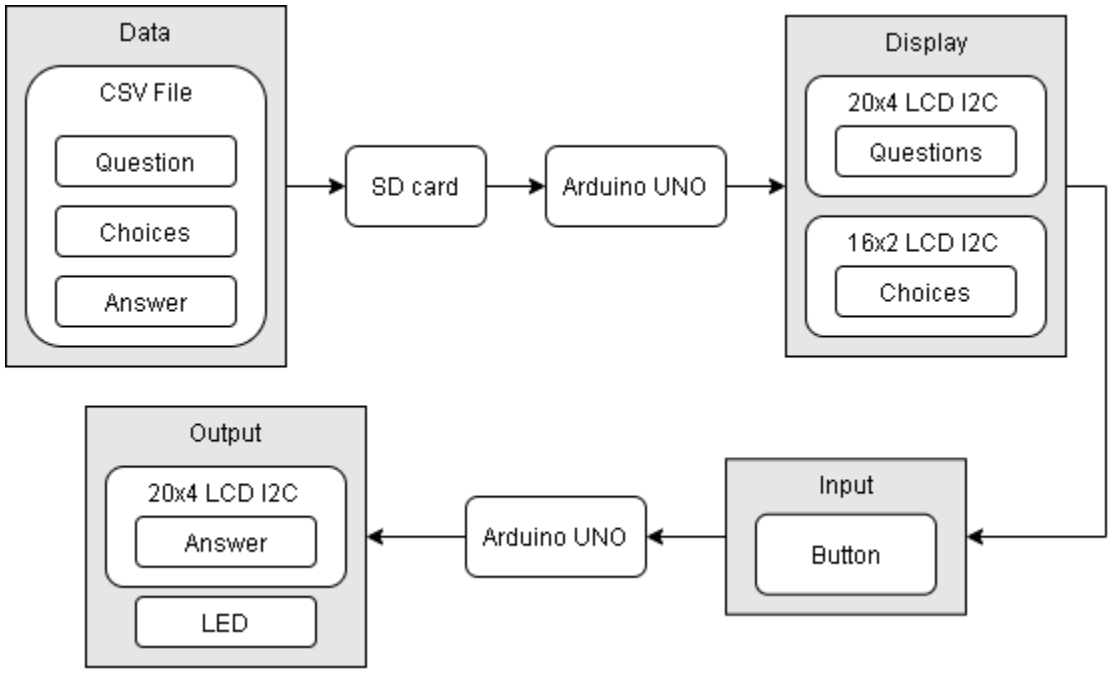
The objective of this project is the following:

- Read stored file in an SD Card via SD Card Module
- Integrate button as input for multiple choice answers
- Display the corrects the correct answer for the given question

Project Description

The digital reviewer intends to create a paperless reviewer for students without the needs of an internet connection as question and answers from different topics are already stored within the device. Furthermore, it is designed to be portable for easier storage and simple usage.

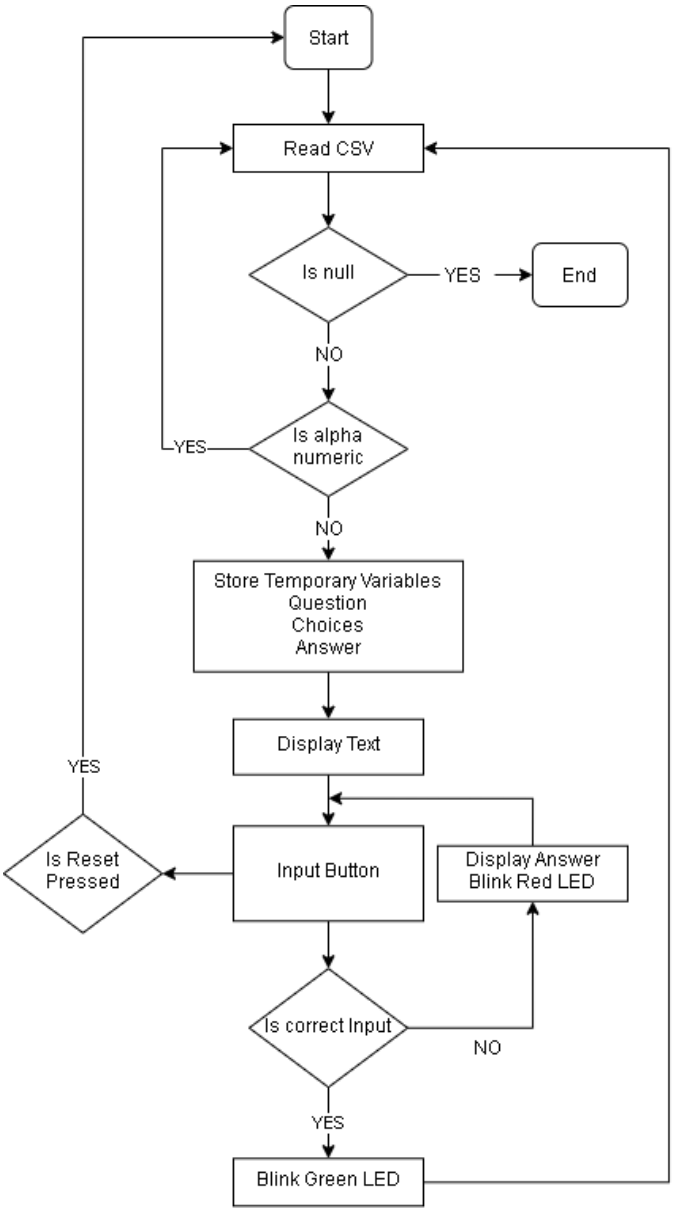
Block Diagram



Questions, choices and the corresponding answers are stored in an CSV file as data in an SD card which will then be read through an SD Card Module via Arduino UNO Board. The file will be read per row and temporarily stored in the board. Then it will be display in the LCD display, where the user can pick the answer and enter the input using push button. Furthermore, a led will indicate whether the input is

correct or wrong, by simply using Green led as the correct indicator and red for otherwise. In addition, if the user also input the wrong choice display will prompt in the LCD to display the correct answer.

Program Flowchart



The Read CSV functionality read the csv file stored in the SD Card per character until there's no longer any characters left to read hence ending the programmer, however if is still contain any characters it will then proceed to a control statement determining it is an alpha numeric character, if true it will continue to read the csv file, if otherwise it will be stored on the corresponding temporary variables. Once the read function encounters a terminating character it will temporarily stop and proceed to display all temporary variables through the LCDs, then the input button will be recorded. It will go under two control statement, if the reset button is pressed it will restart the device, else if the input is wrong the answer will be prompt in the LCD and the Red LED will blink. If otherwise, it will blink the Green LED and then return to the read CSV file.

Scope And Delimitations

The digital reviewer will revolve around the topics of Professional civil, however due to the limited capability of the Arduino UNO board it can be limited to only one CSV file with a maximum row of 15, consisting of a question, three choices and the specified answer. Furthermore, the length of the questions text should only be limited to equal or less than 60 characters. In addition, the SD card will only serve as storage for the questionnaire and the answers and has no capability of manually adding or editing the questions and the answers.

Findings, Recommendations and Conclusion

The findings of the mini project are that it is possible to have multiple LCD I2C and each module can be accessed through a specified address physically adjust through soldering at behind the I2C module. Furthermore, due to the limited capacity of the Arduino UNO memory and processing it is not possible storing the entire text in the CSV file in the microcontroller itself, however it is capable of reading per character and storing temporary string from the CSV file, thus only reading entire file from the start to the end.

The recommendations are the following; if possible use advance microcontroller to handle larger data and utilize bigger display to better display the text. Furthermore, it is also recommended to have its own rechargeable battery to make it completely portable.

In conclusion, creating a handheld device for as reviewer is possible however the microcontroller architecture restricts its capability to store and handle longer text and larger data. The current project needs further improvement in its processing and display so that it can be easily use by both students and educators in the education sector.

References

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