ECSE 324
Laboratory No. 4 Report

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Introduction

This is the report for Lab 4.

Part 1: VGA

Description

The task was to build a C based application to test the functionality of the VGA driver by displaying pixels and characters.

Approach Taken

Subroutines were implemented to display all the color samples possible by turning on each color pixel in order, to show 4800 ASCII code characters and show characters in ascending order using numbers in Hexadecimal representation. Pushbuttons and slider switches were implemented to clear the display or to allow a particular test to be run.

Challenge Faced

Mapping the hexadecimal characters properly.

Part 2: PS/2 Keyboard

Description

The task was to create a simple application that uses the PS/2 keyboard and VGA monitor by using the PS/2 port to accept input from a keyboard. The application would read raw data from the keyboard and display it to the screen if it is valid.

Approach Taken

A pointer variable used to point to the data extracted from the keyboard and plot it onto the screen. A subroutine was used to check the RVALID bit and return the data to the address where the pointer was addressing.

Challenge Faced

None.

Part 3: Audio

Description

The task was to write a driver for the audio port for use the audio controller to play generated tones. One integer argument should be written to both the left and the write FIFO only if there is space in both the FIFOs.

Approach Taken

A subroutine was written to access the data register of the audio port and write to the corresponding left and write registers. The subroutine would return a value of 1 if successful or 0 if unsuccessful. The C program was written such that the sample rate was divided by the frequency and then halved. This was the total sample space that should be allocated to one half cycle. Two iterations were used, one to write a positive cycle, the other for the negative. The loops would only execute their counter if data is successfully written.

Challenge Faced

Configuring the loops to get the exact frequency required.

Conclusion

Got to learn how to connect the Altera board to a monitor, keyboard and audio output.