Michael Divis

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Module 3 Journal

During this week of class, we are going to be looking into multiple interfaces that can be used for coding with peripherals and different devices. We will go over a few and talk about which ones are good and what they're strengths are and compare them to each other. For my interface choices I have decided to look into GPIO, PWM, and UART interfaces since I have seen a decent amount about those in our course so far and they seem like good ones to study. The first one we will be looking into is going to be the GPIO.

When looking at the information about the GPIO interfaces, it looks like they are very commonly used and can have a few alterations done to them to make their functionality even stronger or more versatile than the simple purposes it is intended for. GPIO stands for General Purpose Input/Output device, and it is basically a pin on a circuit board that can be used for input, output, or for both simultaneously. The pin itself can be programmed and controlled by the user during runtime of the project using it. GPIO’s are used by the designer of a circuit board would be the user in the case of use in an integrated circuit and used by a system integrator when used in the case of board level GPIO’s.

The next interface we are going to go over is the PWM interface which stands for Pulse Width Modulation. This is a technique used to allow variable analog signals to be produced using digital means. The value of the output from these interfaces is controlled by a high and a low signal, or 1 and 0 when we look at it numerically. PWM signals are used for a lot of things, some of which include motors, valves, pumps, hydraulic and other mechanical type of parts. We are using this interface in our course to control the LED functionality in the first and second modules.

The last interface we are going over is called the UART interface or Universal Asynchronous Receiver/Transmitter. This interface is one of the most used device-to-device communication methods out there. When setup correctly the UART interface can be used for a multitude of different serial protocols that involve transmitting and receiving data.

From everything I've looked into it seems UART is the most used and most useful interface out of the three I looked into. UART is able to be used for much more than PWN and GPIO. GPIO is limited to design by a board designer while the other two are able to be created and implemented by the programmer or user. PWM is a little bit above GPIO but still does not stand up to UART. PWM and UART have been seen used together though which shows they are able to perform tasks that one another cannot complete alone.

All these interfaces have been developed for their main purpose in mind, but over time have been used for much more than the original intentions. For some like UART they have been adapted to work with multiple devices and able to handle multiple processes and protocols. This course has been very interesting to me even with having to buy a second circuit board since the first one was a fail. Im excited to learn more about these interfaces and how to manipulate them.