CPE 301 1104 - Lab Report 5

Lena Kemmelmeier, Lab Partner: Emma Cornia

March 14, 2024

1 Abstract/Introduction

This lab allowed us to better familiarize ourselves with UART functions and simple character manipulation. Specifically we wrote four classical serial functions: U0Init, U0kbhit, U0putChar, and U0getChar. With this, we improved upon our understanding of receiving and transmitting data with UARTs. Altogether, our program translated characters to hexadecimal. That said, UARTs have broad applications, especially in communicating between modules.

2 Experimental Design

We used an Arduino Atmega 2560 connected to a computer with the Arduino IDE. We created a program that would send a string representing the ASCII code for the key pressed on a keyboard (a two-digital hexadecimal code).

We filled in these functions: U0kbhit, U0getchar, and U0putchar. The overall idea is that when transmitting data, we would wait for the transmitter buffer flag (TBE) to be empty, and then put a byte in the data register. If we were receiving data, we would check the receive data available (RDA) flag, and then return the data register. Basically, before transmitting the data, we would translate the characters into hex, though.

3 Results

When we pressed a key on the computer, we would see the ASCII code for the string outputted in the serial monitor window in the follow format: "0xYY" followed by a new line character. If "1" was pressed, for example, "0x31" would be outputted. See Figure 1 (below) for more example outputs.

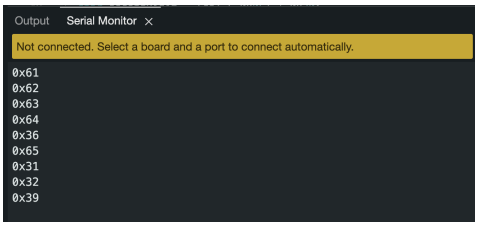

Figure 1: List of outputs following a series of key presses. I believe Emma lists the inputs that correspond to each of these lines (for extra verification), but feel free to check our code!"