# Project 4

Distance Conversion over UART with Bluetooth

CptS 466

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## Requirements

### Overview

For this project, we will implement a system that can connect over Bluetooth and communicates over UART. This system will take an input of an integer and respond with a distance in centimeters. This will run on a LaunchPad device, with a HC-05/HC-06 bluetooth module connected to Port B.

### Functional Description

The deliverable will be a system capable of communicating over Bluetooth and use the UART protocol at 9600 baud. The Bluetooth module will be connected to Port B. When an input is received, it will respond with an associated distance in centimeters. The input will be a number from 0-9999, and the response will be parsed and converted from um to cm.

### Design Document

The user will connect to the device over Bluetooth and have a client capable of communicating at 9600 baud UART. The system clock will be set to 80 MHz on the TM4C chip. The dataflow diagram is shown below in Figure 1.

Diagram

Description automatically generated

Figure 1: The dataflow diagram of the system.

## Discussion

There are several limitations of the system. The LaunchPad only accepts numeric inputs and will not necessarily display an error for non-numeric inputs. Additionally, the HC-05 was found to have several bugs and only the HC-06 would operate without major issues (this may be due to imprecise baud rates).