Spring 2021

California State University, Northridge
Department of Electrical & Computer Engineering

Mini Project 1
Waveform Generator

May 15, 2021

ECE 520L

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Mini Project 1: Run Instructions

1. The zipped file will contain the following:
    a. Vivado Project
        i. This contains the source project for Mini Project 1.
    b. Matlab Script
        i. This is used to display the results of the generate function.
    c. Source code **waveformGen.c**.
    d. All images used in this instruction report.
2. This project was created using Vivado 2019.1 and ZYBO was used as the target hardware device. Make sure to extract the folder before starting.
    a. To open this project open the zipped folder and go to \MiniProject1_JoseMartinez.zip\MiniProject_1 and open MiniProject_1

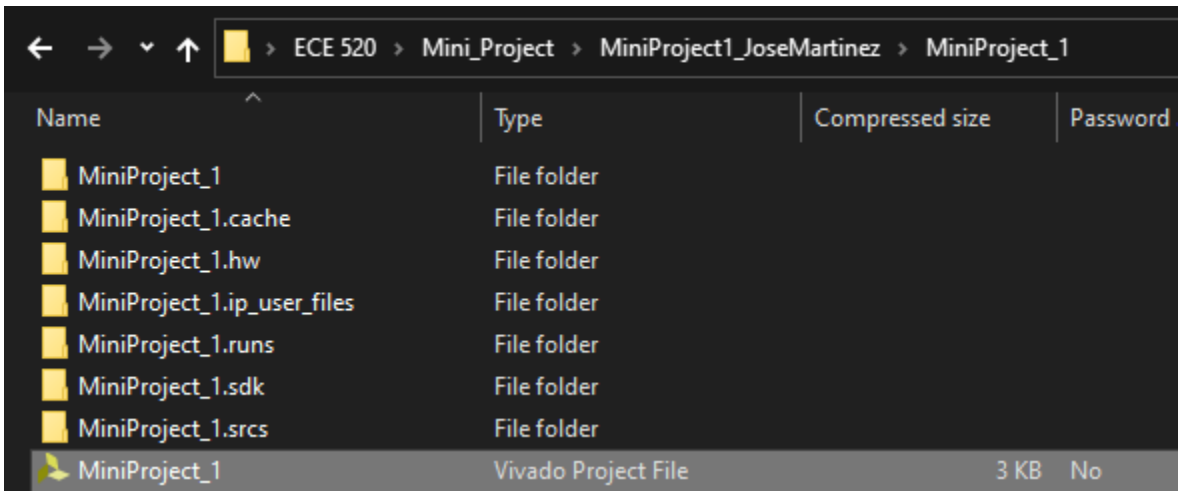

Fig. 1 Vivado Project Directory

3. Once in Vivado, go to **File** and click on **Launch SDK**. In SDK make sure your board is connected to the computer and is turned on. Then program the FPGA and make sure to connect to the terminal on the SDK or another terminal of your choice. Finally click run and you should see a similar output as below.

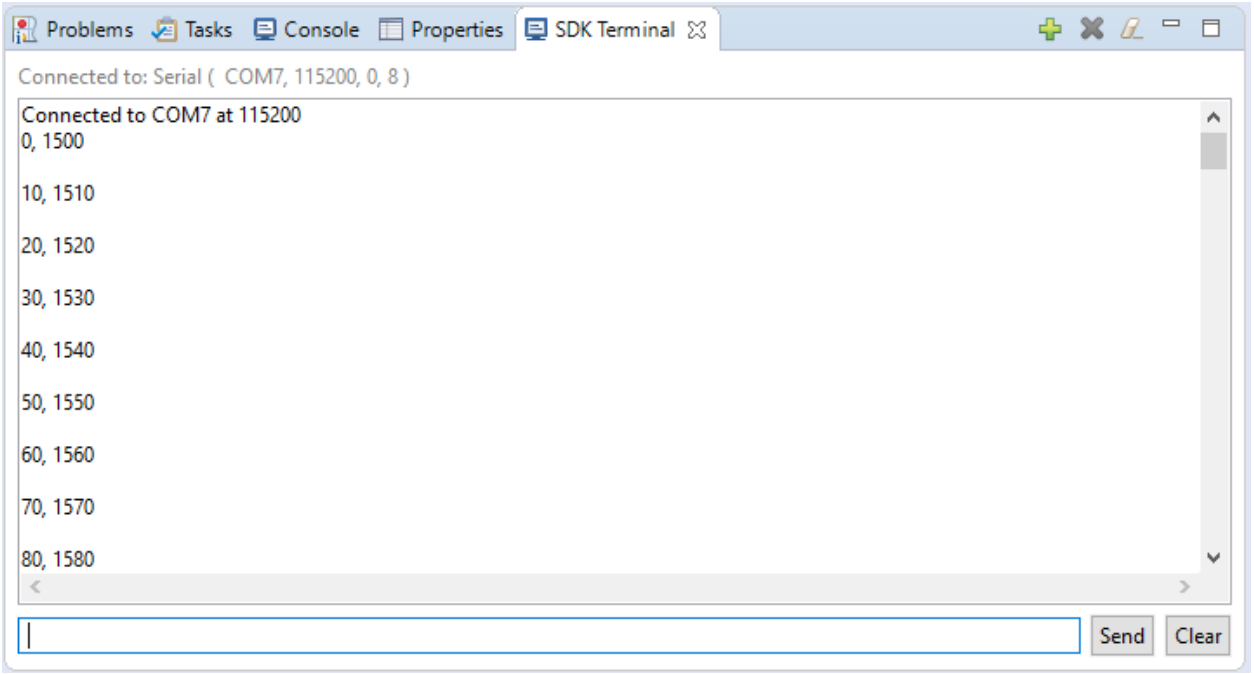

Fig. 2 SDK Terminal

4. I used Matlab to generate the graph for me. To see the graph in **Matlab** copy and paste all of the values you see in the terminal in a file called **waveform.csv**. This file can be found in the matlab_script folder inside the zipped folder. The csv file can be opened by any text editor and just simply delete whatever was there and paste the new values you got from the terminal.
5. In matlab simply change the working directory to the folder where the matlab_script folder is. Then run the wgff.m file and you should see the following.

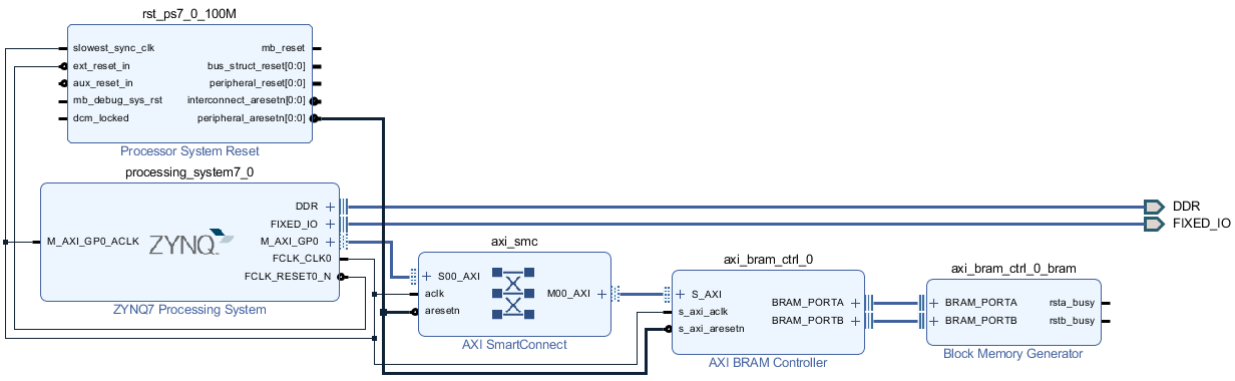

Fig. 3 Block Design

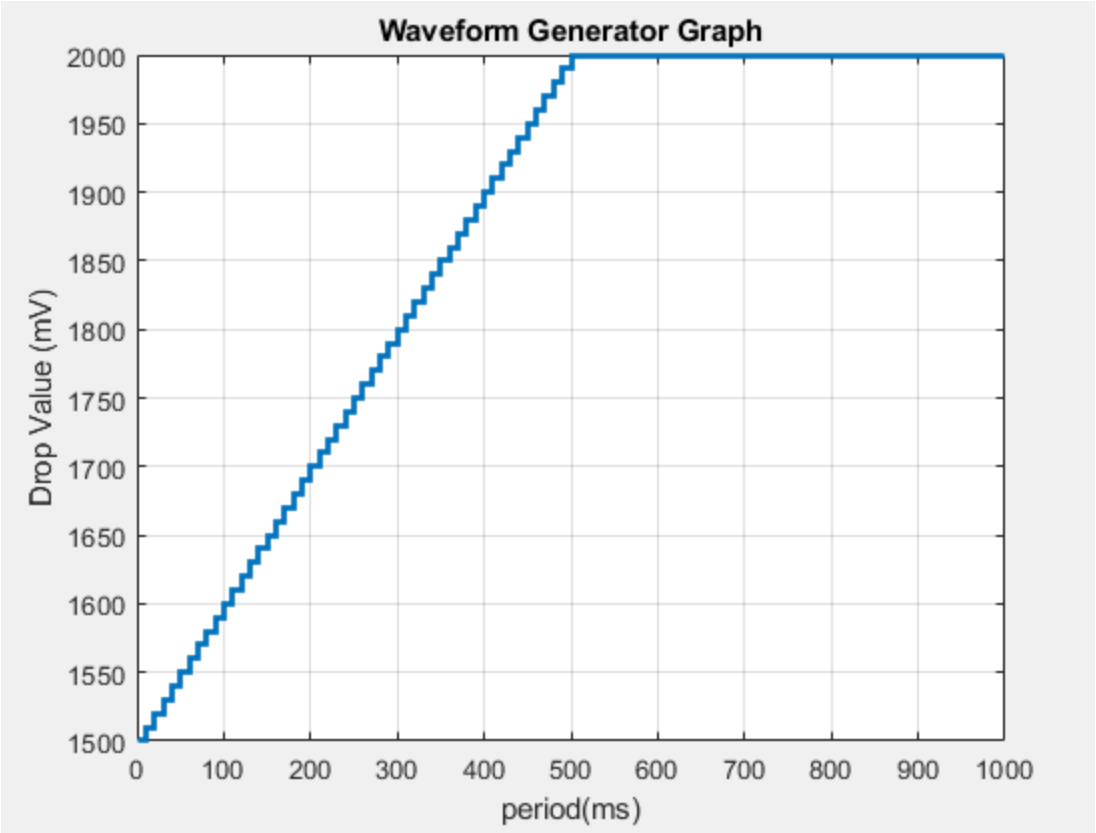

Fig. 4 Waveform Output (Matlab)

6. If the SDK does not detect the files for some reason, just create a new application project and select the Hello World template. Then delete the helloworld.c file and import the provided waveformGen.c file. Then go to step 3.