Electronic Systems of Computers
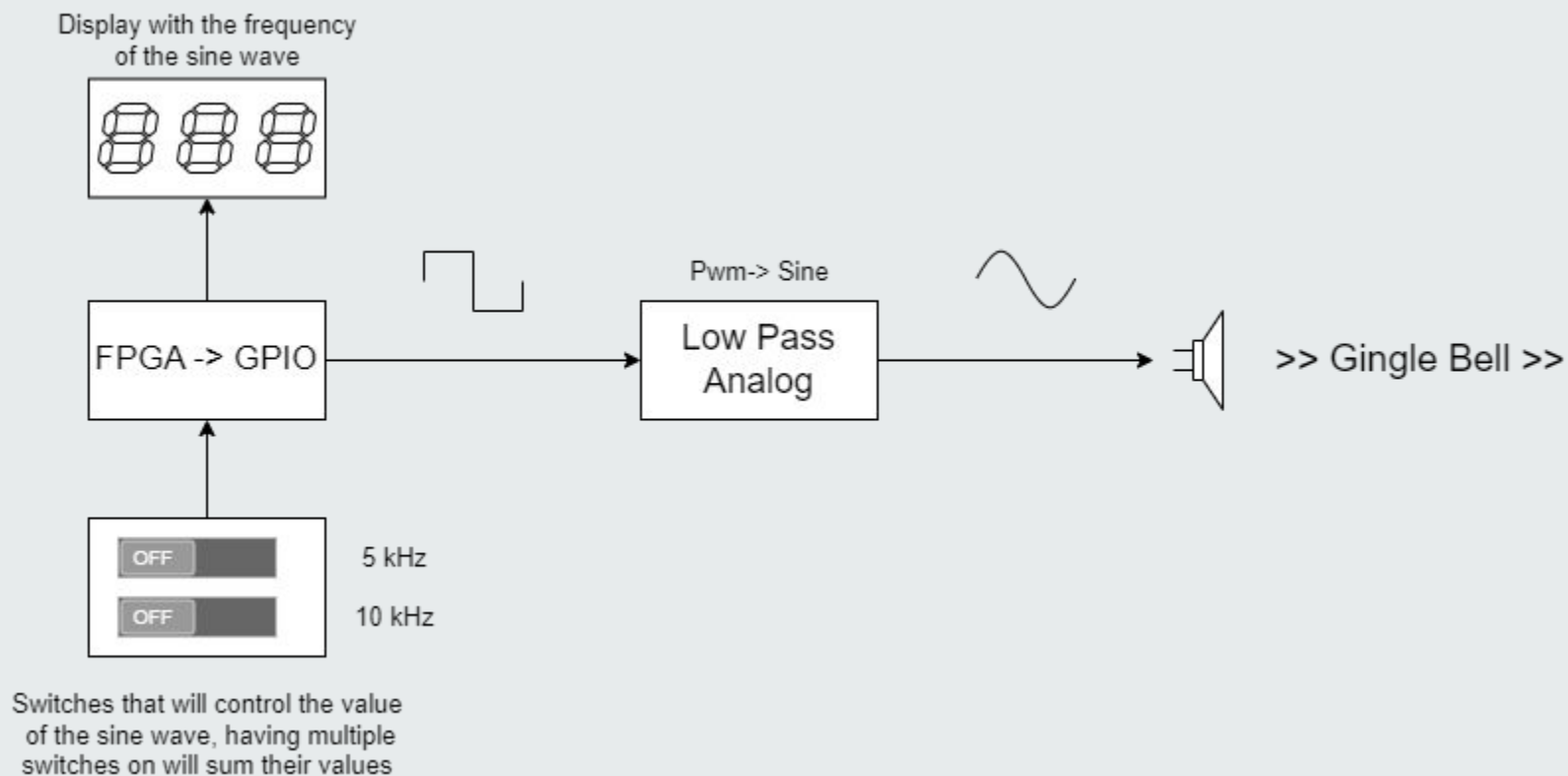
Lab Assignments

First assignment (done)

- Modify IOb-SoC's firmware to print Fibonacci numbers

- Simulate

- Run on FPGA board

Second assignment (due 10/12/22)

- Add GPIO peripheral to IOb-SoC

- Modify firmware to drive GPOs

- Modify firmware to read GPIs
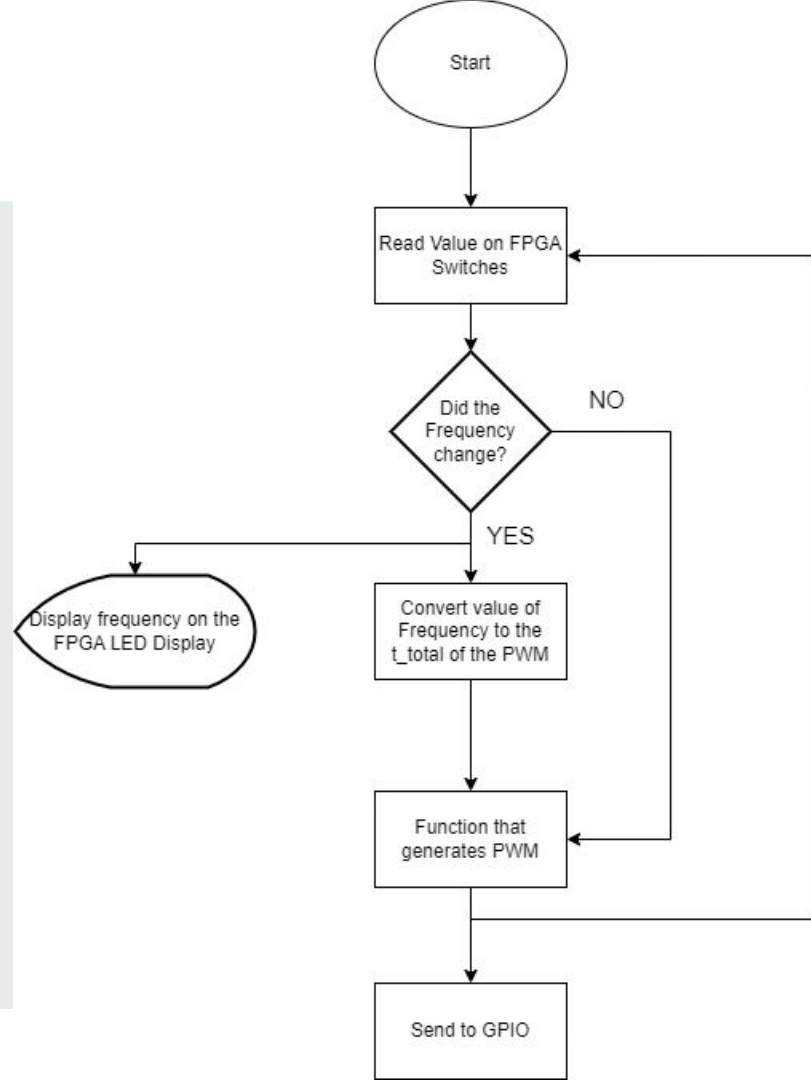
- Simulate

- Run on FPGA board

Project proposal (due 15/12/22)

- Propose a IOb-SoC system that uses the resources of the BASYS3 FPGA board

- Firmware and peripherals that read buttons and switches and write to display and VGA

- External hardware may be added to project (be careful with voltage compatibility, study docs and schematics)

- CAUTIONS: hold USB socket with one hand while plugging with the other hand

- The proposal is a 3-page presentation placed in the doc directory of your repo: short intro, description of project and expected results.

Display with the frequency of the sine wave

Pwm-> Sine

FPGA -> GPIO

Low Pass Analog

>> Gingle Bell >>

OFF 5 kHz

OFF 10 kHz

Switches that will control the value of the sine wave, having multiple switches on will sum their values

Functions:

- PWM Creator

- Frequency Selector

- Write Frequency

- Frequency to time converter

Start

Read Value on FPGA Switches

Did the Frequency change?

NO

YES

Display frequency on the FPGA LED Display

Convert value of Frequency to the t_total of the PWM

Function that generates PWM

Send to GPIO

Project execution (due 15/01/23)

- Prepare 10 minute slide presentation
  - Short intro mentioning other works 1-2 slides
  - Project description: 6 slides
  - Conclusion: 2 slides (what you learned, what you did, directions for continuation)

- Demo the project in the Lab (5 minutes)