Temperature Controlled Fan

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Introduction

Project Overview:

- Temperature Controlled Fan
- Displays Temperature on Nexys 4 DDR Board
- Cools targeted area

Real World Application:

- Can be used within homes
- Can be used within commercial buildings
- Technology used to create project can be applied in many ways

Introduction

Goals:

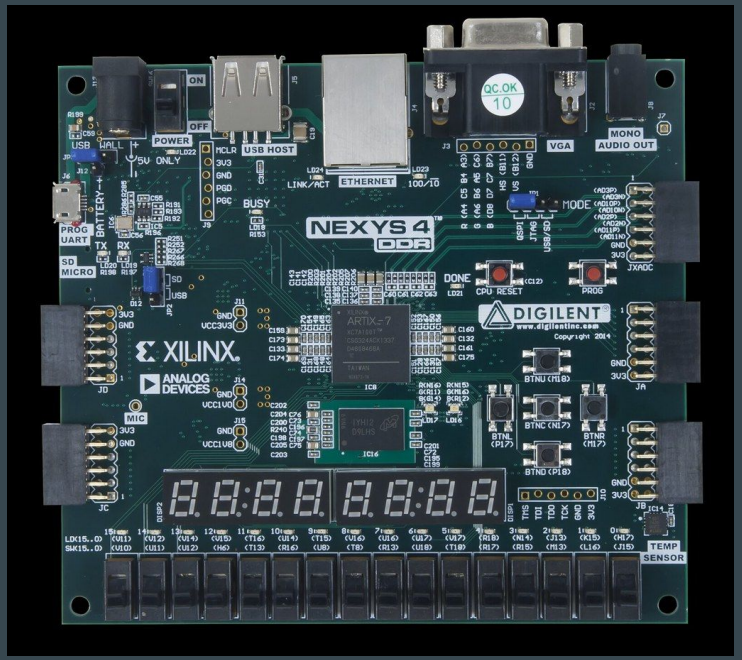
- Apply knowledge gained throughout the semester
- Create unique design
- Make a well-executed project with real-world uses

Background:

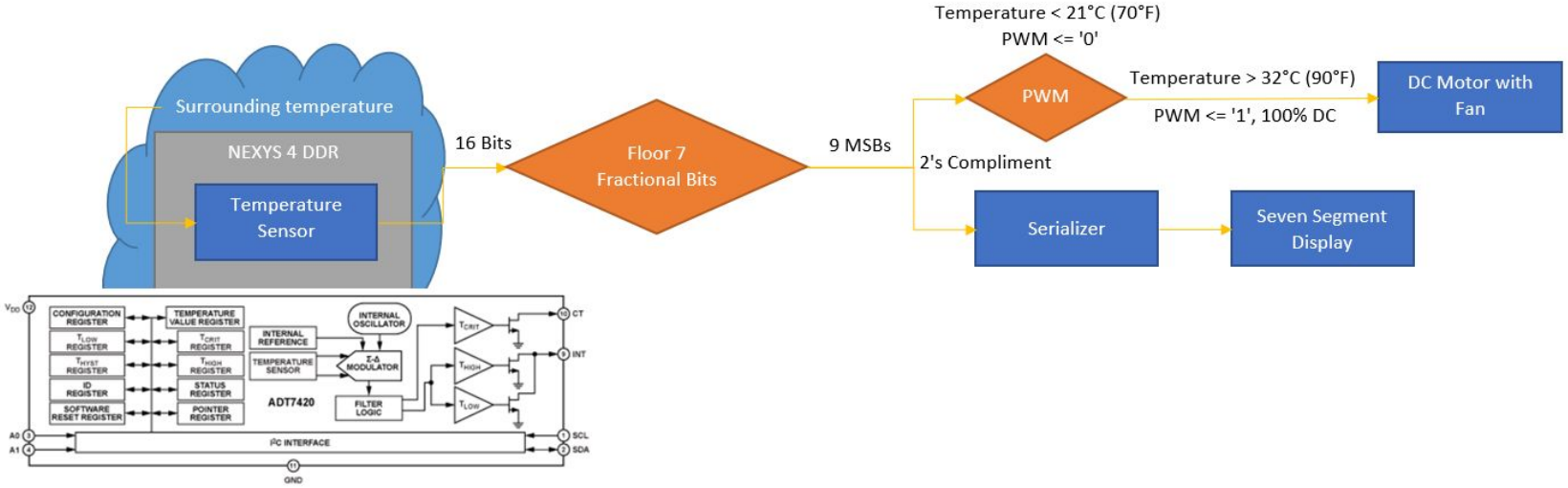
- Temperature sensors are used in several modern applications
- The combination of the sensor with a reading and a fan is highly probable
- Homes, Cars, Boats, etc. have a need for this similar design

Hardware/Software

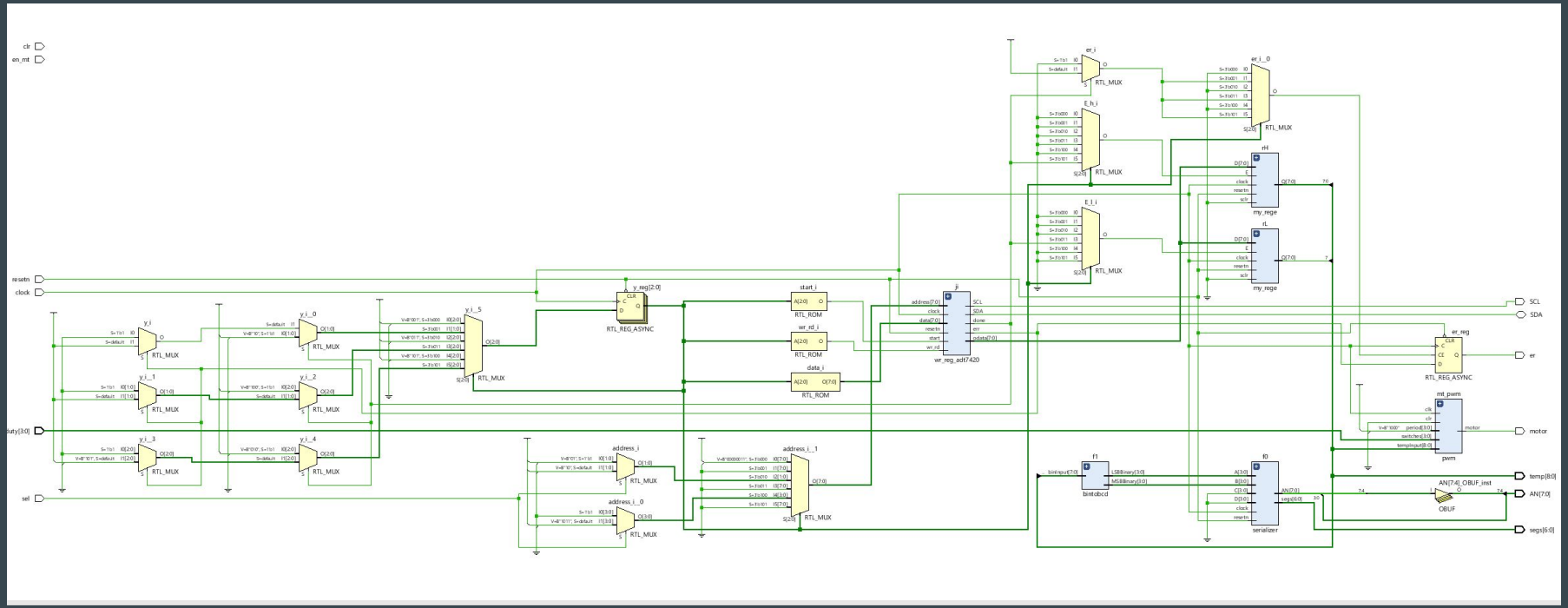
- Nexys 4 DDR
  - ADT7420 Temperature Sensor
  - Temperature Display
- Pulse Width Modulation Signal
  - DC motor
  - Power Supply
  - Transistor
- Breadboard
- Wires



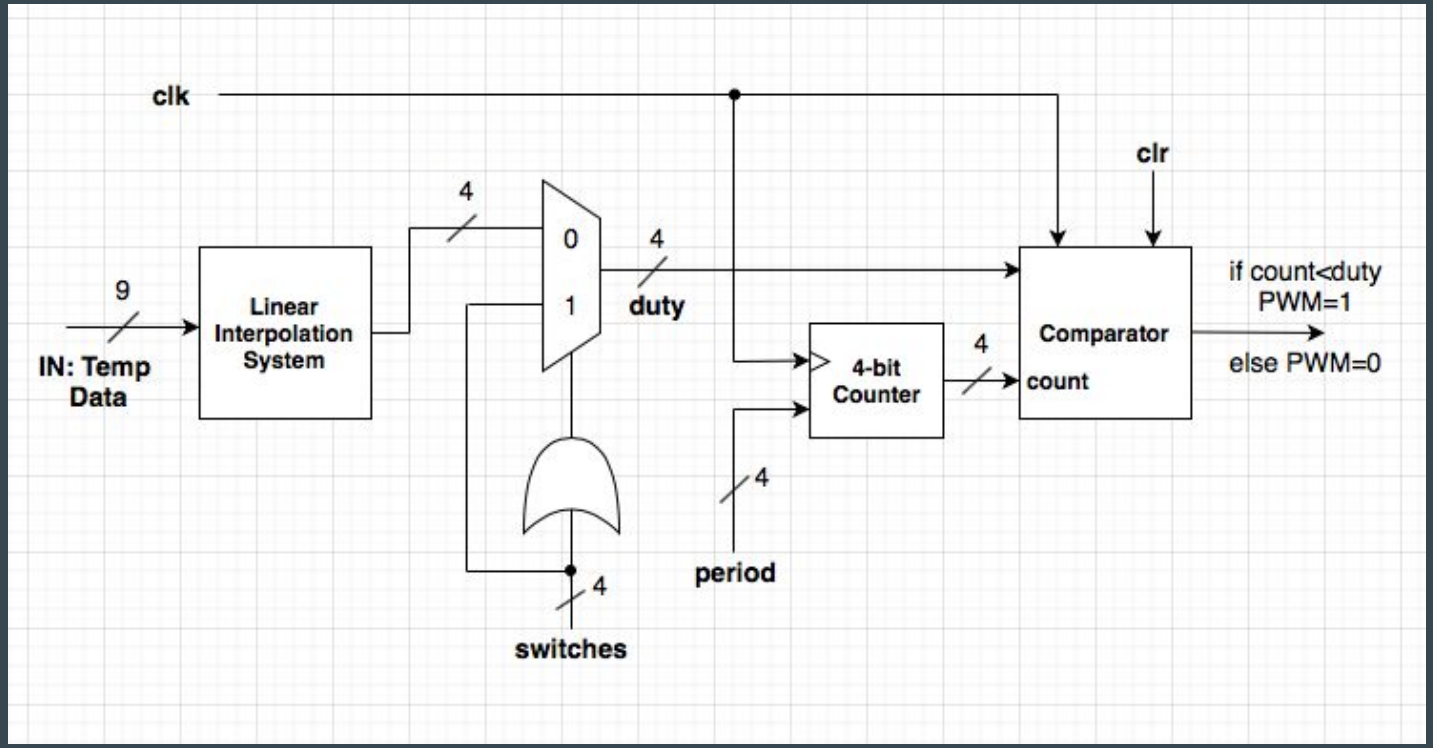
Configuration:



Block Diagram

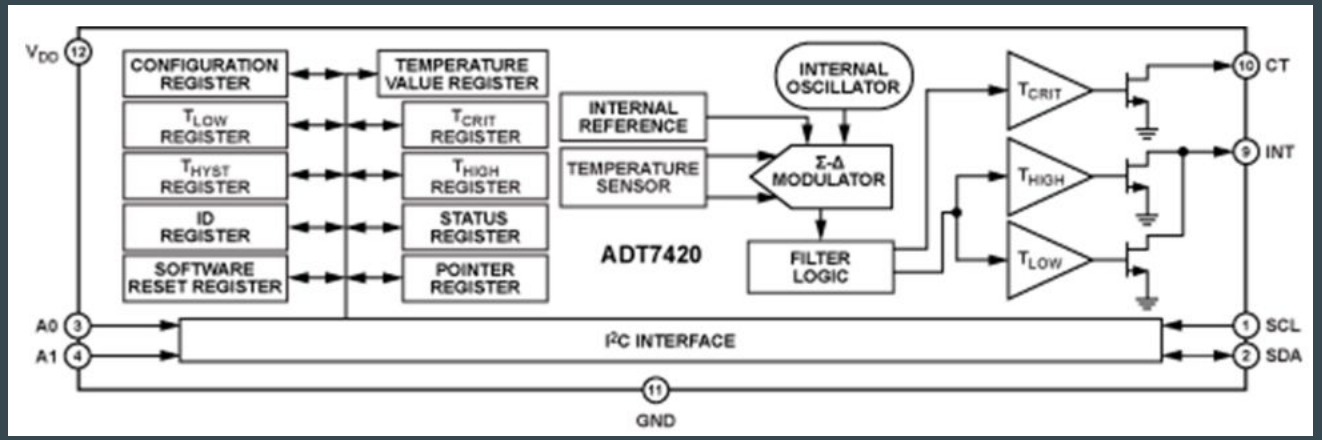


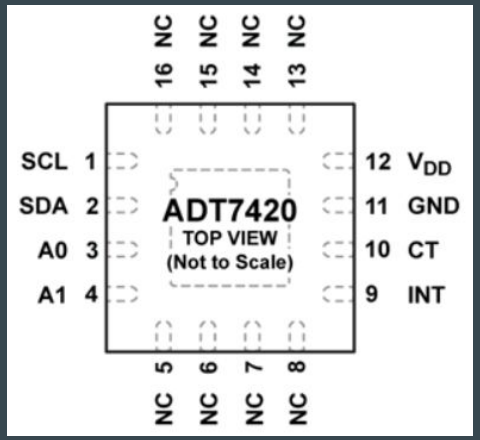
PWM and Linear Interpolation of DC



Temperature Sensor Diagram

ADT7420 Temperature Sensor

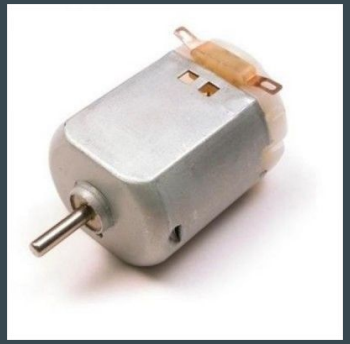


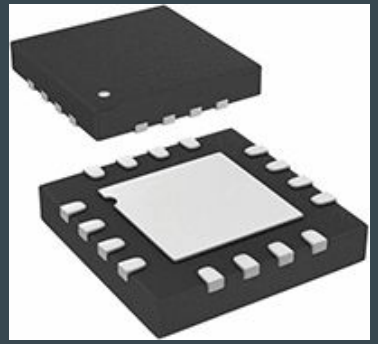


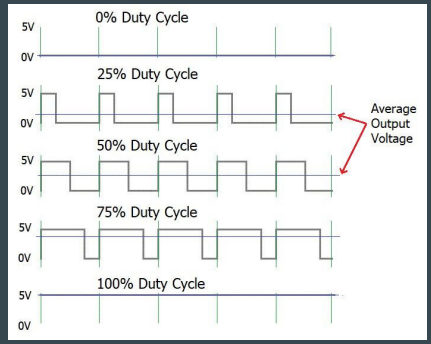
Discussion/Results

The project was a success:

- Initial research to understand components



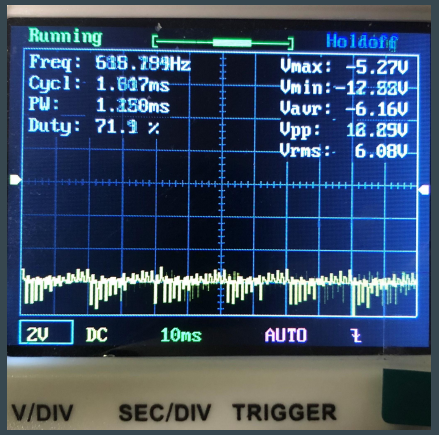


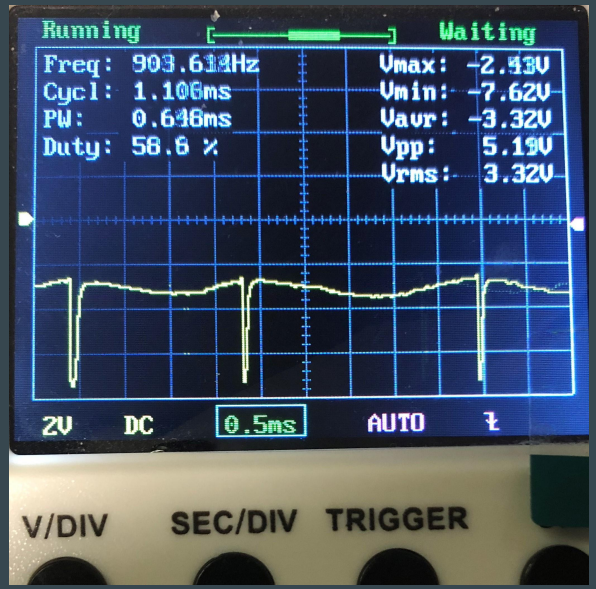


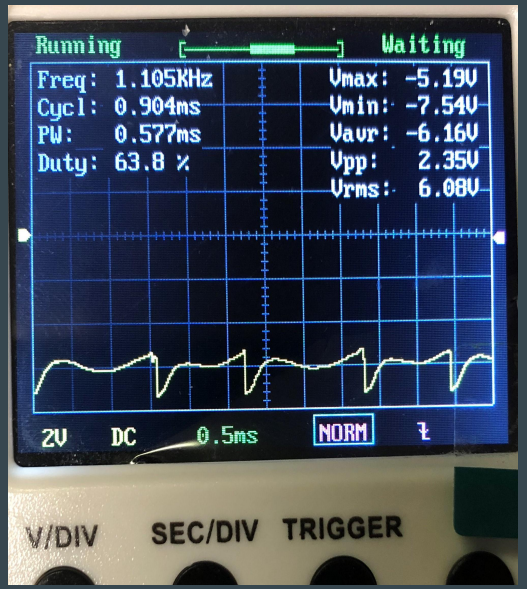
- Developing, adjusting & debugging (software/hardware)
- Creating separate code & combining

Oscilloscope Results

View of different duty cycles through an oscilloscope, used to debug.
Why does the Hardware manager in Vivado kept shutting down? We seemingly draw too much current from the I/O pin, we added some resistance hoping to help..







Conclusion

Findings:

- Implemented in class topics
- Real world applications
- Implementing software and hardware
- Debugging

Group Work:

- Time management
- Critical thinking skills
- Communication skills

DEMO

Link of Video:

https://www.youtube.com/watch?v=YVdxcObGVf0