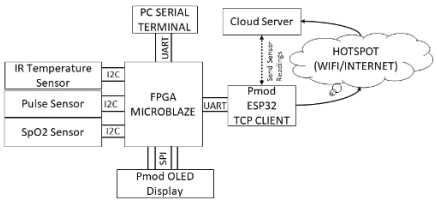
Title: Multi-Parameter Health Monitoring System

Introduction: The goal of this project is to design and develop a system that can continuously monitor vital signs such as heart rate and oxygen saturation level, Body Temperature, Display these reading on an OLED display and send these data to a cloud server for analysis. The system will use multiple sensors to collect the data, including one Pulse sensor and one SpO2 sensor and one Temperature Sensor. A Microblaze processor will be used to control the sensors, collect the data, and send it to the cloud server.Additionally, the system will display the data on a Pmod OLED display. The Microblaze processor will be implemented using the Microblaze IP in Xilinx Vivado and other IPs will be added as required. The software will be developed using Xilinx Vitis and coded using Xilinx C. The system will be implemented on the Nexys A7-100T board.



Hardware Requirements:

- Development Board: Nexys A7-100T
- 1x SpO2 Sensor: MAX30102 from Maxim Integrated (same sensor for measuring oxygen saturation level and pulse)
- 1x Wifi communication Module: PmodESP32 WiFi module (sending collected data to cloud server)
- 1x OLED Display: Any Model (for displaying sensor data)
- 1x GY-906 Infrared-Temperature sensor MLX90614

Software Requirements:

- Xilinx Vivado Design Suite for hardware design and IP integration
- Xilinx Vitis for software development
- Xilinx C for programming
- Web-based platform such as Thingspeak for data visualization

Project Objectives:

- Design and integrate the hardware for the system using Xilinx Vivado and Microblaze IP
- Develop and implement the software for controlling the sensors, collecting the data, and sending it to the cloud server using Xilinx Vitis and Xilinx C
- Develop a web-based platform for data visualization and analysis
- Test and evaluate the performance of the system

Deliverables:

- A working prototype of the Multi-parameter Health Monitoring System
- A comprehensive report detailing the design, implementation, and evaluation of the system
- All relevant source code, documentation, and design files