ARM SoC:Experiment -1

Building an SoC by interfacing GPIO-LED with ARM Cortex M0

Introduction

The purpose of this experiment is to build a System on Chip-Integrating the GPIO-LED peripheral with ARM Cortex M0 processor using AHB Lite Bus and to Synthesis and Check the behavior of the same.

Objective

Toggle the LEDs for the data 55 and AA with equal duration for both data

Software tools Requirement

Modelsim (Siemens)/ Xilinx Vivado/ Icarus Verilog

arm Keil µvision 5.37

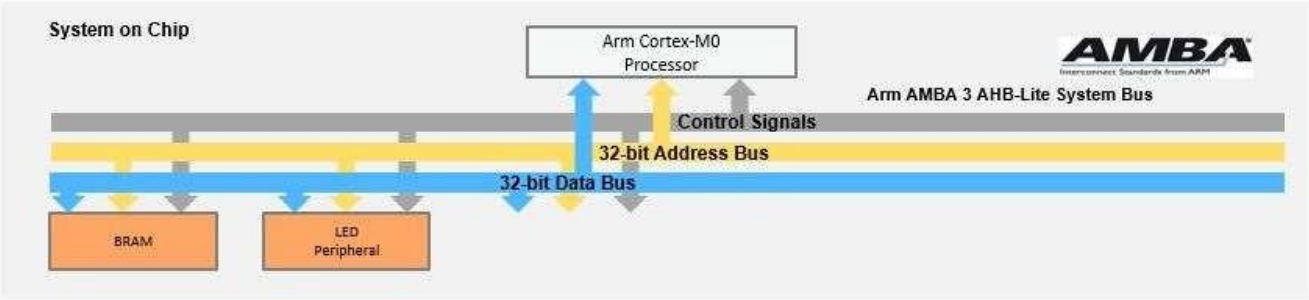
Software programming:

Program the Cortex-M0 processor using arm assembly language and generate the hex file using **arm Keil µvision 5.37**

Synthesis

Synthesis the same on ARTY A7 FPGA Kit.
Results should have
Synthesis Report
RTL Schematic
Pin Mapping Report
Screenshot of the Remote Lab-Showing outputs (if any)

Block Diagram:



Memory Map of Peripherals

Peripheral	Base address	End address	Size
MEM	0x0000_0000	0x0000_FFFF	16MB
LED	0x5000_0000	0x50FF_FFFF	16MB

Outcome

After this experiment, the learner would get a basic idea about designing a simple SoC based on arm cores, how to interface peripherals to the core using the AHB Lite bus, and how to program the processor using Assembly language.

Reference

Demo video in session 10