Project Topics

1. Matrix multiplication is available for the values 16 and 64. Implement it for 256, 512, 1024, 2048, 4096 and compare the timings for the same. Plot a graph comparing the timing for various values. Comment on the observed speed up or speed down.
2. Use the E-GDB debugger in Parallela to debug the programs. First debug a simple hello world program and then debug the matmul 64 program. The simulator only supports debugging programs running on a single Epiphany CPU core. How can you debug the cores sequentially one by one. Show the steps followed and comment on any observations. **(+2 bonus marks)**
3. Implement a matrix multiplication program on FPGA. Matrix multiplication should be implemented in a way that the processor can initiate the matrix multiplication in FPGA and read results when the multiplication is finished. **(+4 bonus marks)**
4. Implement an USB controller on FPGA available on Xilinx Zynq and use it to communicate with the ARM cores available on Zynq. The communication may be as simple as initiating the program and providing the test vectors to the implemented USB. The main focus will be on communication between ARM and FPGA. **(+4 bonus marks)**
5. You can suggest and work on your own project. The project should be implemented on Parallela board and needs to be approved by the Professor. The bonus marks if applicable would depend on the complexity of the project.

Note: The projects are to be prepared in groups already assigned. The Projects would be submitted on Blackboard along with the detailed project report and project code. The groups will also present a short presentation (5 minutes per group) on the project.