Homework 4

(Due date: June 16th)

Presentation and clarity are very important! Show your procedure!

PROBLEM 1 (20 PTS)

- Calculate the result (provide the 32-bit result) of the following operations with 32-bit floating point numbers. Truncate the results when required. When doing fixed-point division, use $x = 4$ fractional bits. Show your procedure.

✓ C3FA80000 - C1E00000	✓ D0D80000 + D0FA0000	✓ 80C00000×FAD00000	✓ 7B380000 ÷ C8A00000

PROBLEM 2 (20 PTS)

- Complete the table for the following DFX formats (10 pts)

DFX format	p_0	p_1	Number of bits of significand	Boundary value	$num0$ range	$num1$ range	Dynamic Range (dB)
8_4_2							
16_8_4							

- Convert the following signed fixed-point numbers in format [16 8] to the dual fixed-point format 16_8_4. (10 pts)

FX	3A.CD	9B.E6	7A.CE	CA.FE
DFX				

PROBLEM 3 (20 PTS)

- Calculate the result of the following operations where the numbers are represented in dual fixed-point arithmetic. Note that the results must be in the same format. Include an overflow bit when necessary.

DFX Format: 8_4_2	Result	overflow		Result	overflow
EA+2E			EB-99		
D3+C5			65+FD		

PROBLEM 4 (40 PTS)

- Attach your Project Status Report (no more than 3 pages, single-spaced, 2 columns, only one submission per group). This report should contain the current status of your project. For formatting, use the provided template (`Final Project - Report Template.docx`). More details need to be provided:
  - ✓ Details, i.e., architecture of the AXI Interface
  - ✓ Allocation of tasks: i) software routine, and ii) reconfigurable hardware.
    - Software routine: provide top-level pseudo-code of your software application
    - If you plan to use run-time alterable hardware, indicate what tasks it will be doing.
  - ✓ Hardware Architecture: Include a Block Diagram with a complete I/O description (how many signals, how many bits per signal) and I/O mechanism.