FL24 CSE565M - Lab 1

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Simulation

1. Log into build server using either the VNC server or just the terminal directly (without the GUI)

2. Navigate to (or create and navigate to) the directory where you want Lab 1 to live.

   ```
   mkdir -p /home/your_username/path/to/where/you/want/lab1/to/live
   ```

   e.g.,

   ```
   mkdir -p /home/cabrera/lab1
   ```

   Create an environment variable for this path

   ```
   export LAB1PATH=/home/your_username/path/to/where/you/want/lab1/to/live
   ```

   I'll now refer to this project path by the `LAB1PATH`.

3. Clone this project to the repository

   ```
   git clone https://github.com/cabreraam/Vitis_Accel_Examples.git
   ```

4. Run these environment setup commands

   ```
   source /tools/Xilinx/Vitis/2023.1/settings64.sh
   source /opt/xilinx/xrt/setup.sh
   ```

   To verify that the scripts ran, you can issue

```
echo $PATH
```

and should observe output similar to this:

```
/opt/xilinx/xrt/bin:/tools/Xilinx/Vitis_HLS/2023.1/bin:/tools/Xilinx/Vitis/2023.1/bin:/tools/Xilinx/Vitis/2023.1/gnu/microblaze/lin/bin:/tools/Xilinx/Vitis/2023.1/gnu/arm/lin/bin:/tools/Xilinx/Vitis/2023.1/gnu/microblaze/linux_toolchain/lin64_le/bin:/tools/Xilinx/Vitis/2023.1/gnu/aarch32/lin/gcc-arm-linux-gnueabi/bin:/tools/Xilinx/Vitis/2023.1/gnu/aarch32/lin/gcc-arm-none-eabi/bin:/tools/Xilinx/Vitis/2023.1/gnu/aarch64/lin/aarch64-linux/bin:/tools/Xilinx/Vitis/2023.1/gnu/aarch64/lin/aarch64-none/bin:/tools/Xilinx/Vitis/2023.1/gnu/armr5/lin/gcc-arm-none-eabi/bin:/tools/Xilinx/Vitis/2023.1/tps/lnx64/cmake-3.3.2/bin:/tools/Xilinx/Vitis/2023.1/aietools/bin:/tools/Xilinx/Vivado/2023.1/bin:/tools/Xilinx/DocNav:/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/usr/games:/usr/local/games:/snap/bin
```

5. Change into the `VitisAccelHelloWorld/` directory of the cloned project:

```
cd ${LAB1PATH}/Vitis_Accel_Examples/VitisAccelHelloWorld/hello_world
```

6. Issue the following commands to build for SW and HW emulation:

   For SW emulation:

```
cp
${LAB1PATH}/Vitis_Accel_Examples/hello_world/_x.sw_emu.xilinx_u280_gen3x16_xdma_1_202211_1/emconfig.json .

make all TARGET=sw_emu
PLATFORM=/opt/xilinx/platforms/xilinx_u280_gen3x16_xdma_1_202211_1/xilinx_u280_gen3x16_xdma_1_202211_1.xpfm
```

   For HW emulation:

```
make all TARGET=hw_emu
PLATFORM=/opt/xilinx/platforms/xilinx_u280_gen3x16_xdma_1_202211_1/xilinx_u280_gen3x16_xdma_1_202211_1.xpfm
```

The SW emulation build shouldn't take too long -- ~1 minute from my testing -- but the HW emulation build will take longer -- ~9 minutes in my testing.

7. Run the applications for both SW and HW emulation

   - For SW:

```
${LAB1PATH}/Vitis_Accel_Examples/VitisAccelHelloWorld/hello_world
export XCL_EMULATION_MODE=sw_emu
./hello_world_xrt -x \
./build_dir.sw_emu.xilinx_u280_gen3x16_xdma_1_202211_1/vadd.xclbin
```

   Copy and paste your output.

   - For HW:

```
export XCL_EMULATION_MODE=hw_emu
./hello_world_xrt -x
./build_dir.hw_emu.xilinx_u280_gen3x16_xdma_1_202211_1/vadd.xclbin
```

   Copy and paste your output.