VHDL, or, How I Learned to Stop Overthinking Things and Build an ALU

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VHDL

a hardware description language used to describe digital systems & implement them using devices such as field programmable gate arrays (FPGAs)

XILINX SDK

an integrated design environment for embedded systems

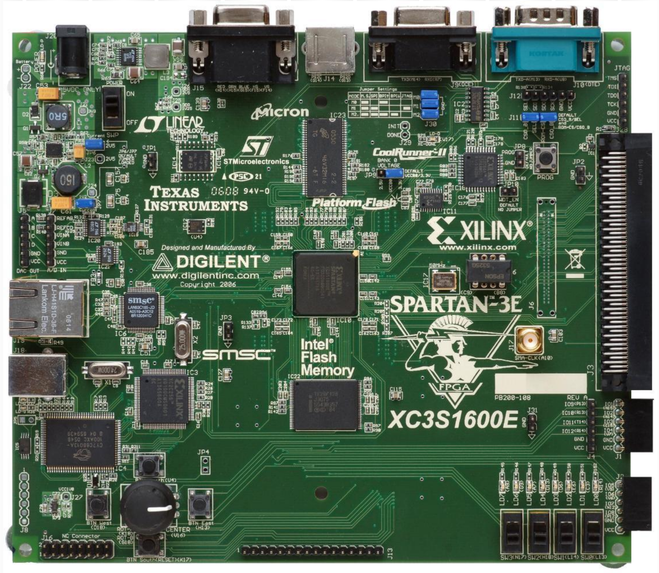
ModelSim

used to simulate & analyze the behavior of VHDL constructs on sample inputs & outputs

Why?

flexible & customizable: allow for reconfigurable systems to fit the task at hand

cost: no need for a new chip for each project



Project

self-directed 300-level course in machine organization

learned: VHDL, Xilinx, ModelSim

created: counters, flip-flops, ALU, CPU, testbenches

programmed: Spartan-3 FPGA with 4-bit ALU

sample code

```
entity cpu is
  Port(dataout: out word;
       datain: in word;
       address: out word;
       readStrobe, writeStrobe: out bit;
       reset: in bit;
       clk: in bit);
end cpu;
architecture interpreter of cpu is
       signal stub : bit;
       signal sdatain : word;
```