Datapath Coding Standards

- Non-leaf nodes should contain only
  - Module instantiations
  - Wires
  - Simple assigns for renaming: assign foo = bar (and not many of these)
- Leaf nodes are either stateful or not.
- Stateful leaves
  - Registers
  - Register files
  - Memory modules.
  - Need to have clk and reset.
  - May contain always @(posedge clk), always @(*), and ‘<=’ assignments
- Non-stateful leaves
  - May contain always @(*), and ‘=’ assignments
  - No clk or reset input.
Datapath Coding Standards

• Consistently use a good naming conventions
• Label all inputs and outputs
  • e.g. foo_in, foo_out
• Include module types in their names
  • A_mux -- the instantiated mux
• Give control lines descriptive and consistent names
  • A_mux_sel_in -- the input that controls the mux
  • A_mux_sel -- should not exist since it would be a control line (and would come from the control path)
  • The control unit would have a corresponding A_mux_sel_out
Build Useful Modules

• Parameterize!
• You should only ever write code for one
  • Register (of any width)
  • 2-input mux (of any width)
  • 3-input mux
  • etc.
• Give your modules descriptive names
  • my3Mux
  • my4Mux
  • myFF
  • gcd_control
  • gcd_datapath
  • gcd -- top-level.