

<h3>Term Project Milestone 3 Evaluation (Datapath and Control Specifications)</h3>

Evaluation Criteria Categories	Specific Criteria	Comments	Score
Consistency with higher level specifications	<ul style="list-style-type: none"> <input type="checkbox"/> State elements that are assigned or referenced in Register Transfer Language (RTL) statements appear in datapath <input type="checkbox"/> Operations that are required to implement RTL statements have corresponding components <input type="checkbox"/> Inputs, outputs, and control signals of components in datapath are consistent with RTL specification <input type="checkbox"/> Connections between components in datapath are consistent with RTL specification <input type="checkbox"/> The control signals specified for each state (or microstep) produce the register transfers specified in the corresponding cycle of the RTL description 	State elements appear to be in datapath. You don't know how to implement multiply / divide yet, so no penalty for them. Multiple problems with datapath: jr, jumpchain, jump cannot write a new value to PC. jumpchain cannot write PC to register. lli needs A run to 16-bitifier. load cannot write to registers. excess muxes before ALU—should be removed. interrupt handling is mostly absent. don't just run busses together, indicate concatenation. There may be more problems, but I am out of room—please seriously revise your datapath for the next milestone.	1/3
Self-consistency	<ul style="list-style-type: none"> <input type="checkbox"/> Input signals that have multiple sources have associated multiplexers <input type="checkbox"/> Multiplexers have appropriately sized control signals <input type="checkbox"/> Datapath includes one or more control units that generate the necessary control signals and have the appropriate input signals <input type="checkbox"/> The value of each control signal is defined for every state (or microstep) 	Multiplexors appropriately combine multiple inputs. Bus signal sizes are not marked on datapath. Control unit is provided. Control signals are defined, but some control signals are not labeled on datapath. FSM applies PC Write more than once per instruction.	2/3
Demonstration of design principles 1. Simplicity favors regularity 2. Smaller is faster 3. Good design demands good compromises 4. Make the common case fast	<ul style="list-style-type: none"> <input type="checkbox"/> Components are kept as simple as possible <input type="checkbox"/> Similar components used by multiple instructions or in multiple cycles are combined where possible <input type="checkbox"/> Tradeoffs between the preceding criteria favor the common case, not the special case <input type="checkbox"/> Regularity in the machine language format is exploited by using combinational logic where feasible <input type="checkbox"/> Identical states (or microsteps) are combined 	Components are reasonably simple. Similar components are combined appropriately. FSM should clearly indicate which steps are combined. It is not necessary to store imm in a temporary register.	2/3

<p>Documentation (see below)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Organization <input type="checkbox"/> Completeness <input type="checkbox"/> Conciseness <input type="checkbox"/> Grammar and style 	<ul style="list-style-type: none"> <input type="checkbox"/> Datapath diagram <input type="checkbox"/> Clear English specifications <ul style="list-style-type: none"> o Effects of control signals <input type="checkbox"/> Datapath tests <input type="checkbox"/> State transition diagram or microprogram specifying the finite state machine <input type="checkbox"/> Truth tables or Boolean equations specifying any combinational units <input type="checkbox"/> Clear English specifications as necessary <input type="checkbox"/> Control unit tests 	<p>Memo is acceptable.</p> <p>Design Process Documentation is fair, would benefit from discussion of more alternatives considered.</p> <p>Design Documentation needs major revision. Datapath has multiple issues as mentioned above. FSM should be combined into one diagram that shows execution branching off from the first few cycles.</p> <p>Webpage should link to updated documentation for each milestone (such as RTL, assembly, etc.). Clearly state that it has been updated for the current milestone and retain the prior version for the prior milestone.</p>	<p>13/16</p>
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Required Documents

- Memo
 - Objective assessment of design and status
- Design Documentation
 - Demonstration of conceptual understanding
 - Highlights interesting features
- Design Process Journal
 - Alternatives considered
 - Tradeoffs
 - Decisions
- Website