TinyMicro control unit X66986_en

Design the control unit of the TinyMicro.

Specification

```
module control_unit ( Instruction , Instruction_Address , EnA, EnB, Op,
                      ReadWrite, MemConst, MemALU, Zero, Positive, Const,
                      clk , rst );
  input [7:0] Instruction ;
  output [5:0] Instruction_Address ;
  output [1:0] Op;
  output [7:0] Const;
  output EnA, EnB, ReadWrite, MemConst, MemALU;
  input Zero, Positive ;
  input clk , rst ;
```

Input

- *Instruction* is the instruction coming from the instruction memory.
- *Zero* is the signal that is asserted when the *zero* condition for a jump is true.
- *Positive* is the signal that is asserted when the *positive* condition for a jump is true.
- *clk* is the clock signal of the circuit.
- *rst* is the reset signal of the circuit.

Output

- *Instruction_Address* is the address sent to the instruction memory (program counter).
- *Op* indicates the type of operation for ALU instructions.
- *Const* is the constant encoded in instruction register (sign-extended up to 8 bits).
- *EnA* and *EnB* are the signals that enable writing into registers RA ad RB, respectively.
- *ReadWrite* is the signal the indicates whether to read (0) from or write (1) into data memory.
- *MemConst* is the signal that controls the datapath multiplexer selecting between data memory (0) and constant from the instruction register (1).
- *MemALU* is the signal that controls the datapath multiplexer selecting between memory/constant (0) and the ALU output (1).

Problem information

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Generation: 2026-02-03T12:25:13.149Z