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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