Arquitetura e Organização de Computadores

Caminho de Dados (Parte 1)

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Disciplina: Arquitetura de Computadores

Câmpus Apucarana

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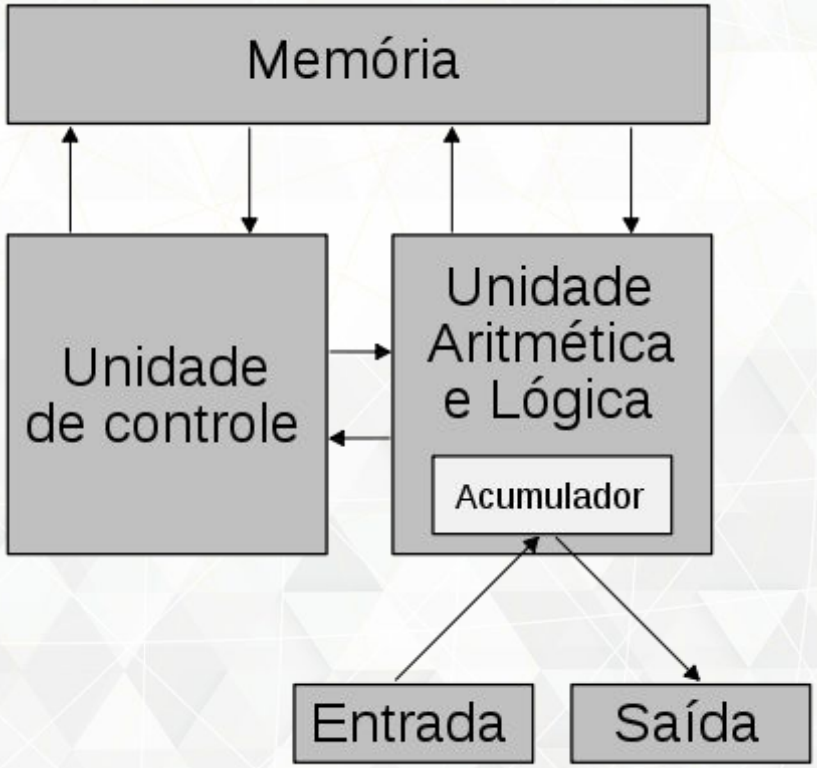
UNIVERSIDADE TECNOLÓGICA FEDERAL DO PARANÁ
CÂMPUS APUCARANA

MINISTÉRIO DA EDUCAÇÃO

BRASIL
GOVERNO FEDERAL

Ciclo Básico de Instruções (Von Newmann)



Classes de Instruções

Campo	0	rs	rt	rd	shamt	funct
Posição de bit	31:26	25:21	20:16	15:11	10:6	5:0

a. Instrução do tipo R

Campo	35 ou 43	rs	rt	address
Posição de bit	31:26	25:21	20:16	15:0

b. Carrega ou armazena instrução

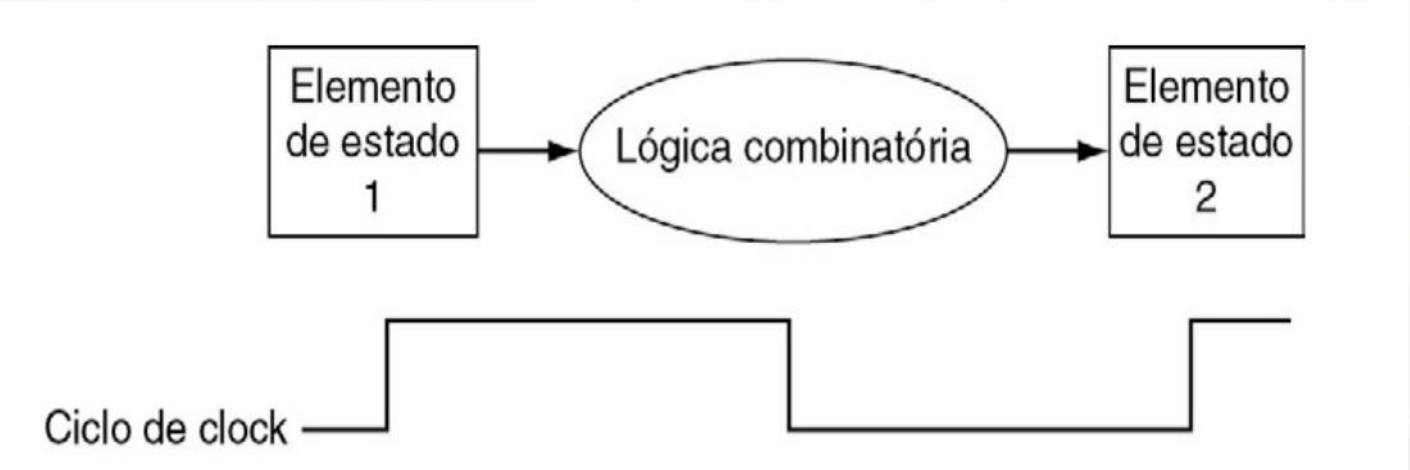
Campo	4	rs	rt	address
Posição de bit	31:26	25:21	20:16	15:0

c. Instrução de desvio

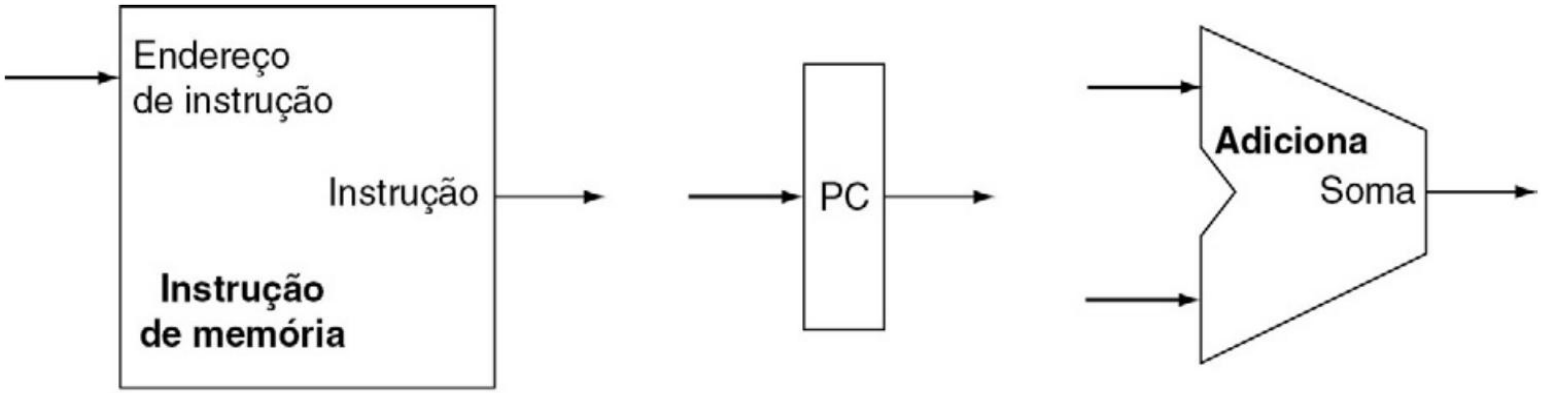
Desempenho

- Depende CPI (ciclos de clock por instrução)

Método de Clocking

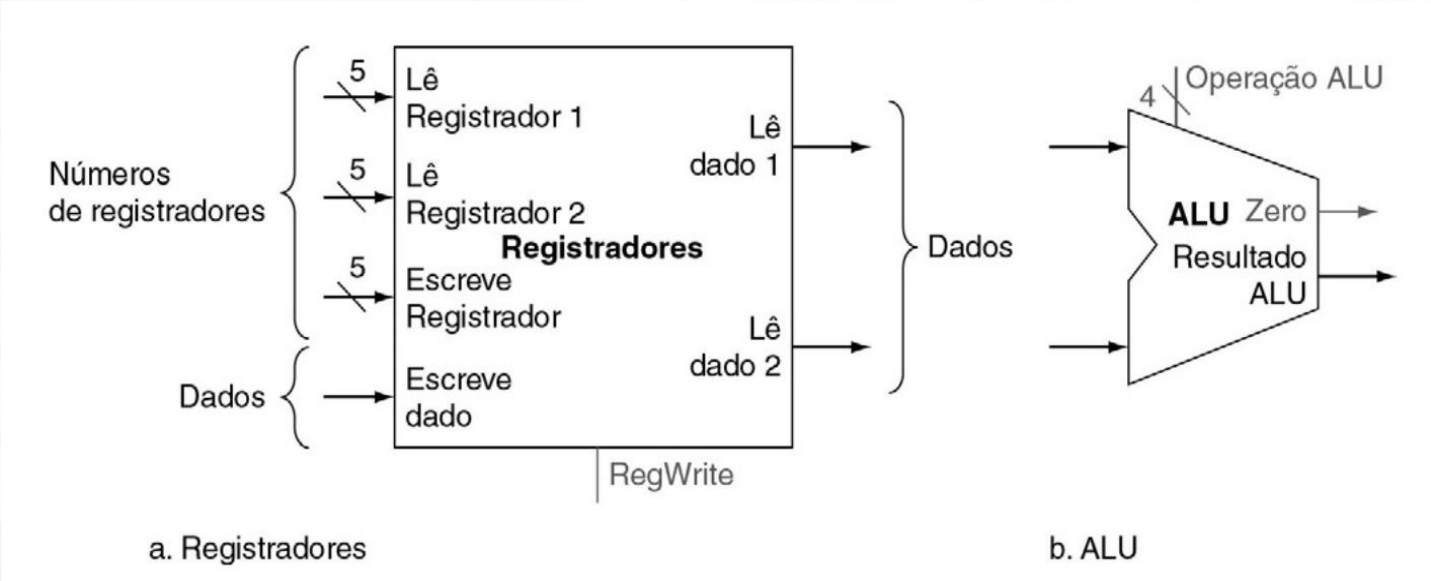


Elementos do caminho de dados

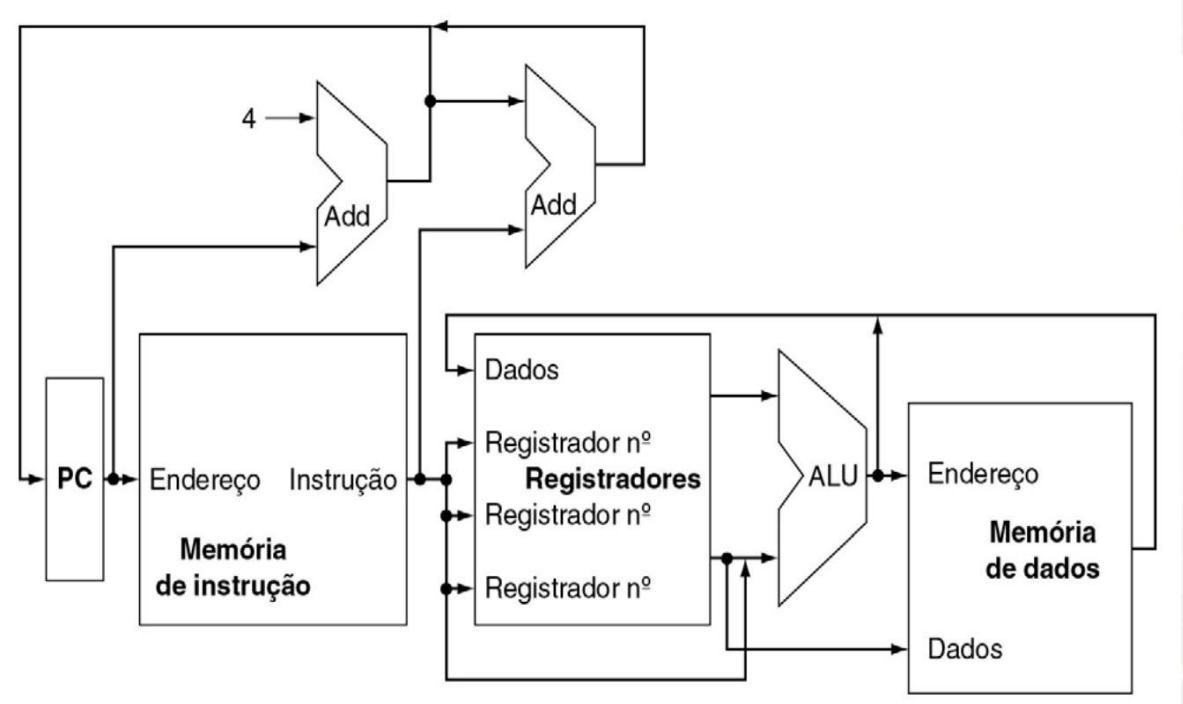


a. Instrução de memória b. Contador de programa c. Adicionador

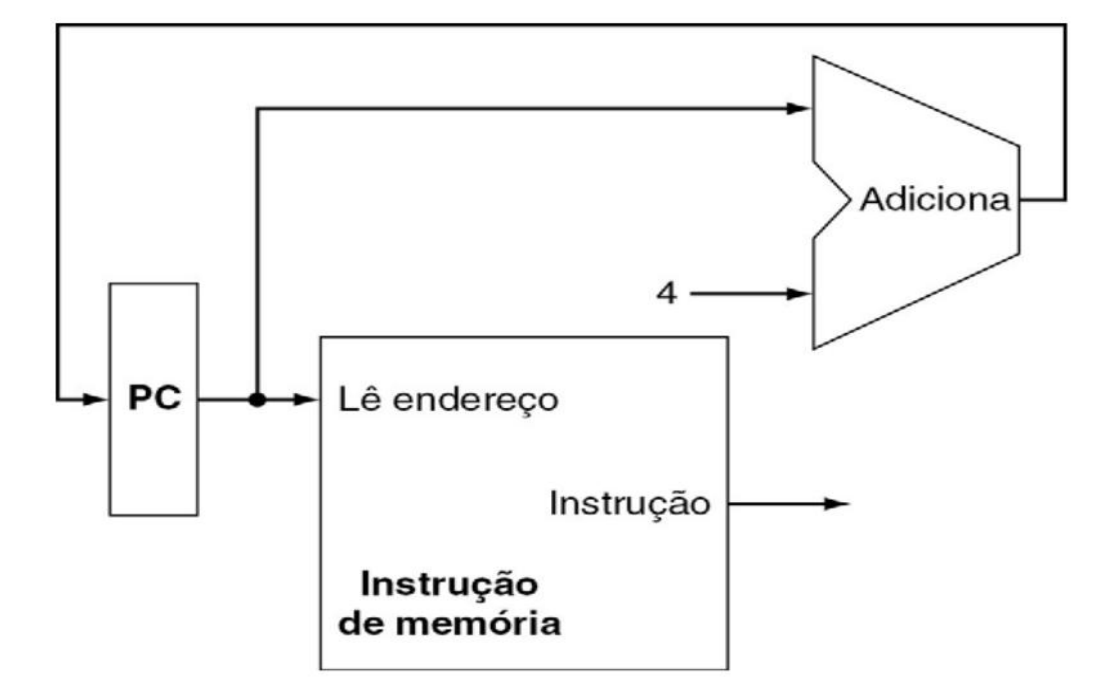
Elementos do caminho de dados



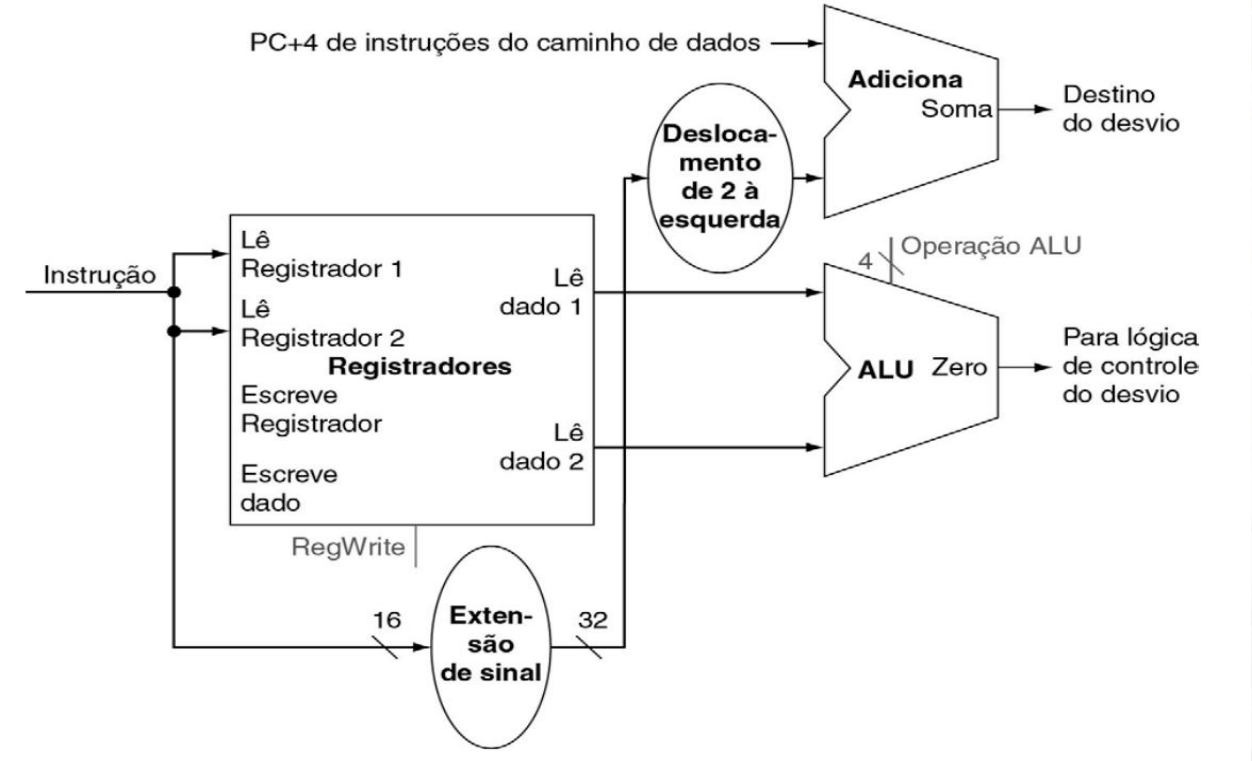
Caminho de Dados Simplificado



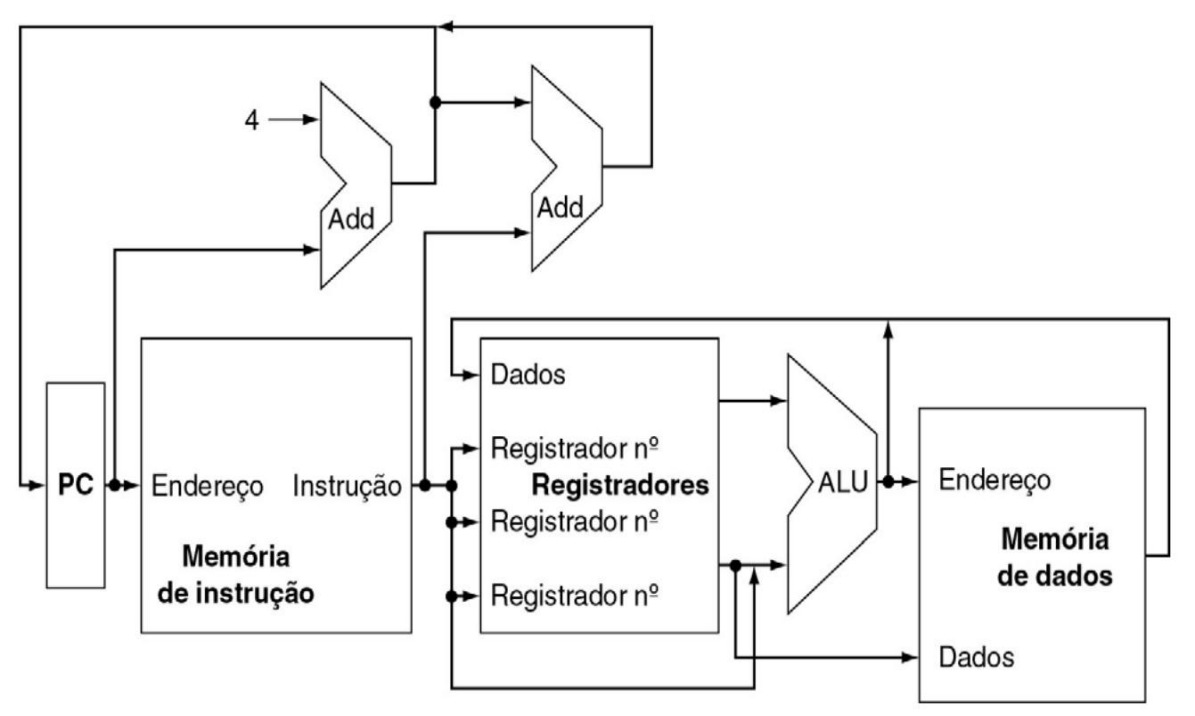
Caminho de Dados: Busca



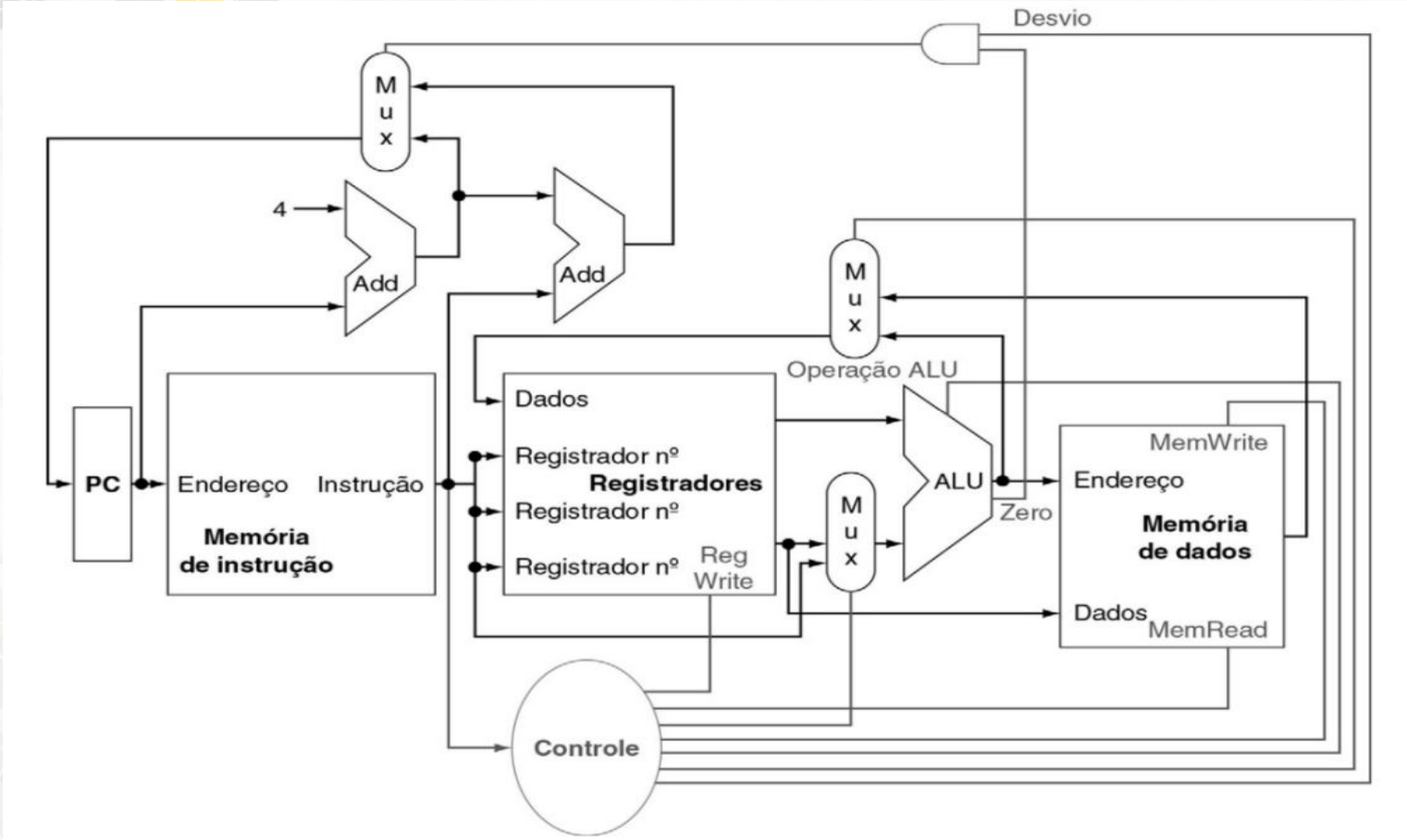
Caminho de Dados: Desvio



Caminho de Dados



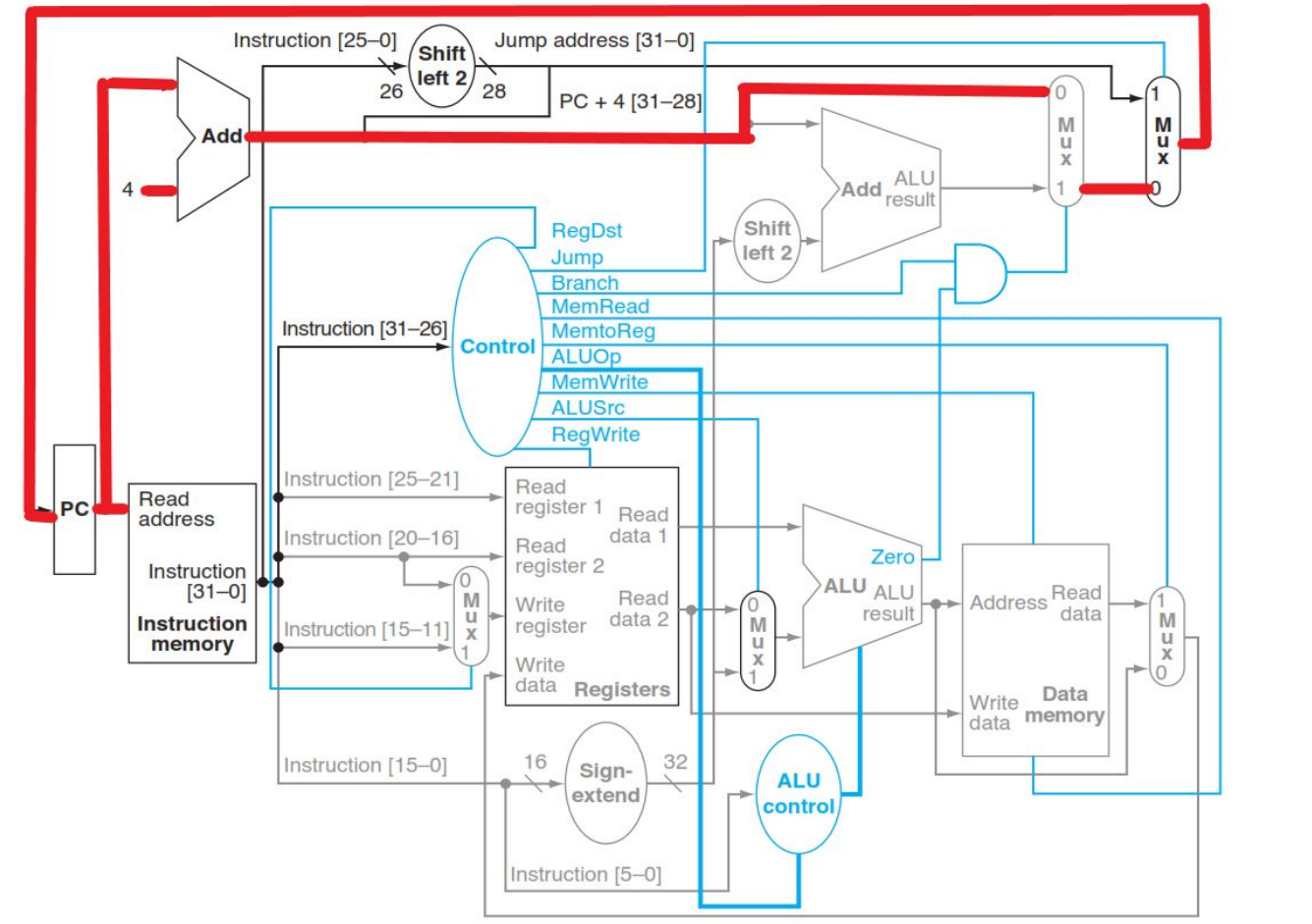
Caminho de Dados: Unidade de Controle



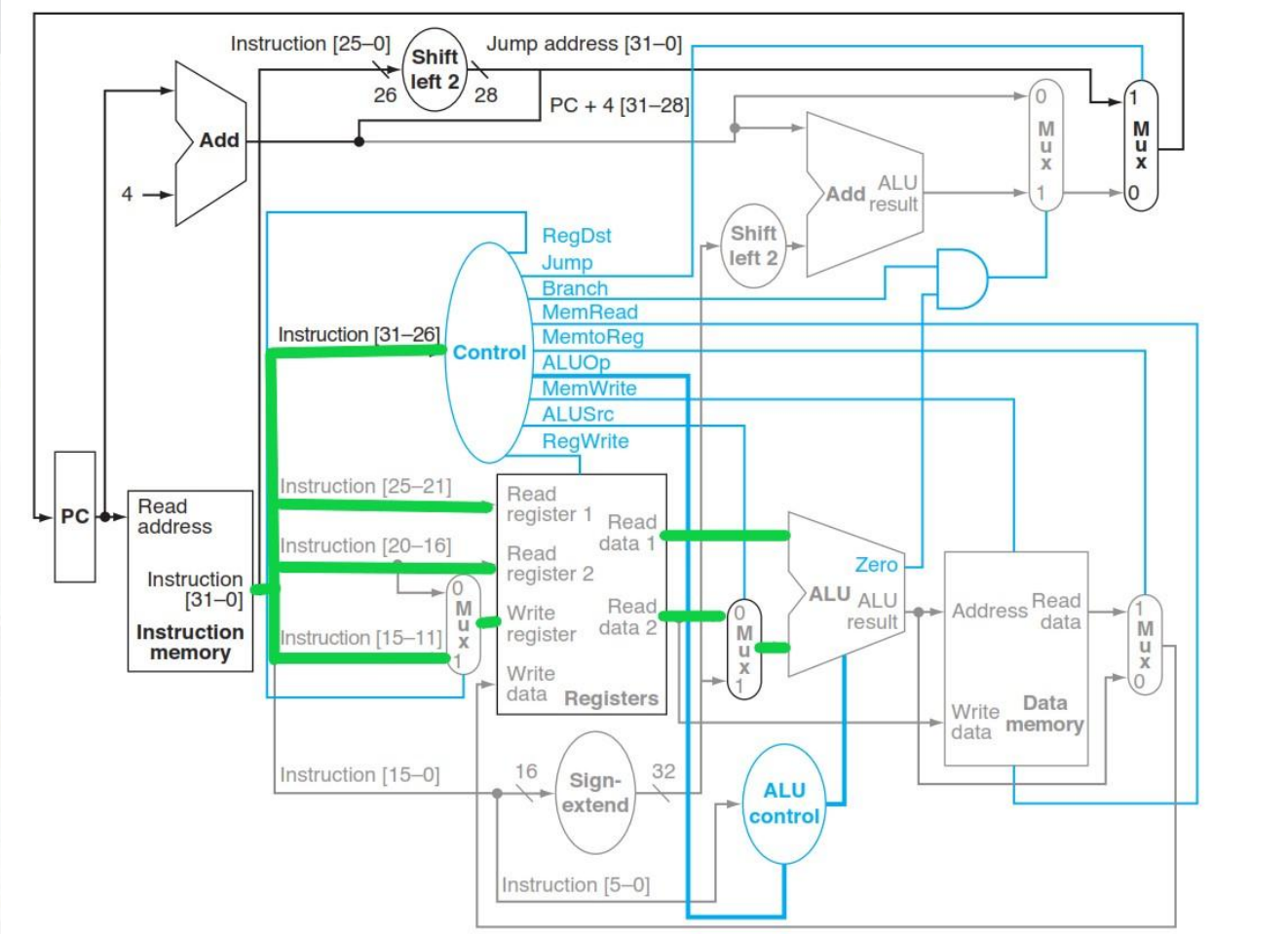
Instruções Suportadas

Opcode da instrução	OpALU	Operação da instrução	Campo funct	Ação da ALU desejada	Entrada do controle da ALU
LW	00	load word		add	0010
SW	00	store word	XXXXXX	add	0010
Branch equal	01	branch equal	XXXXXX	subtract	0110
tipo R	10	add	100000	add	0010
tipo R	10	subtract	100010	subtract	0110
tipo R	10	AND	100100	AND	0000
tipo R	10	OR	100101	OR	0001
tipo R	10	set on less than	101010	set on less than	0111

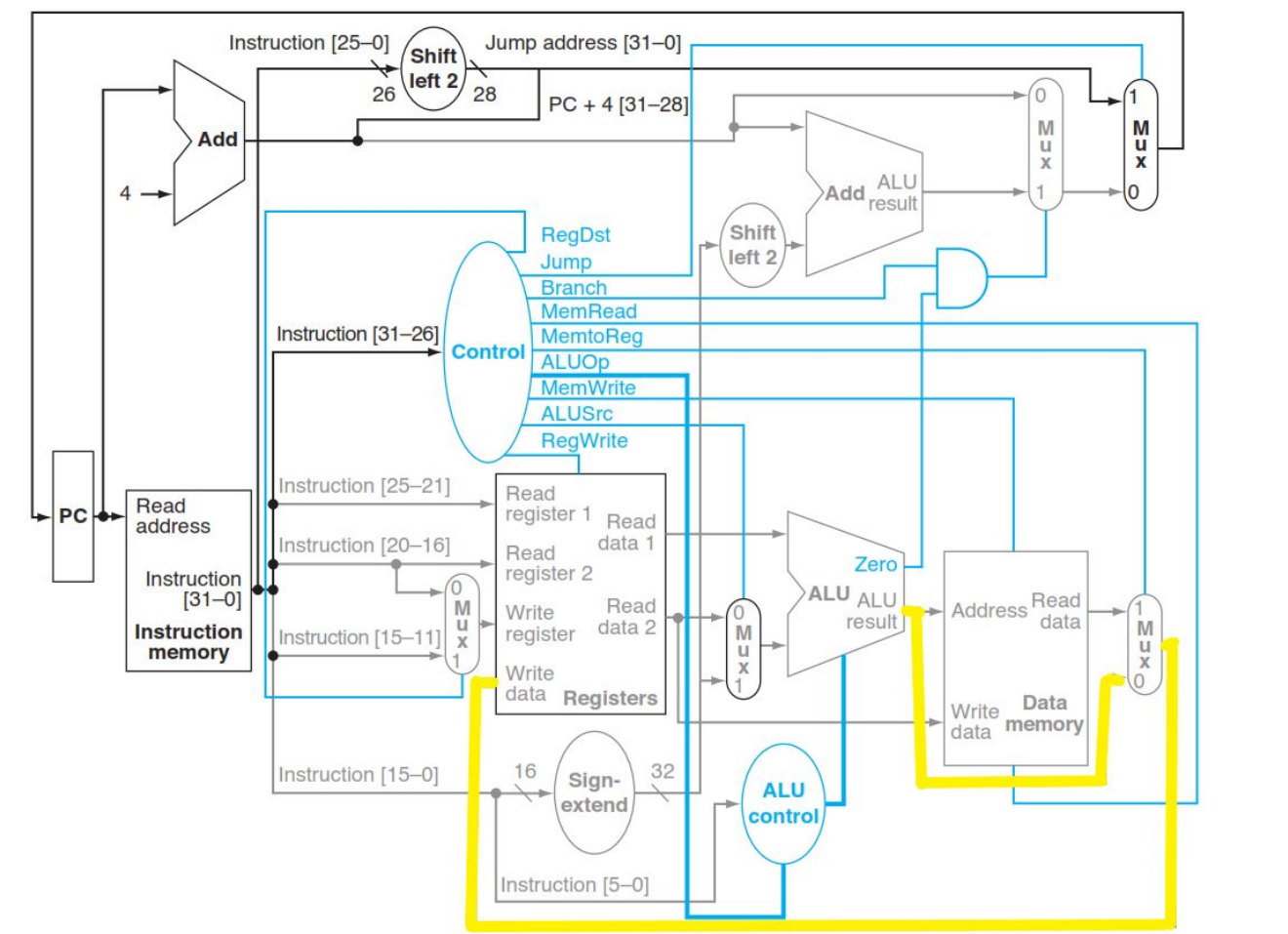
Exemplo (ADD – type R)



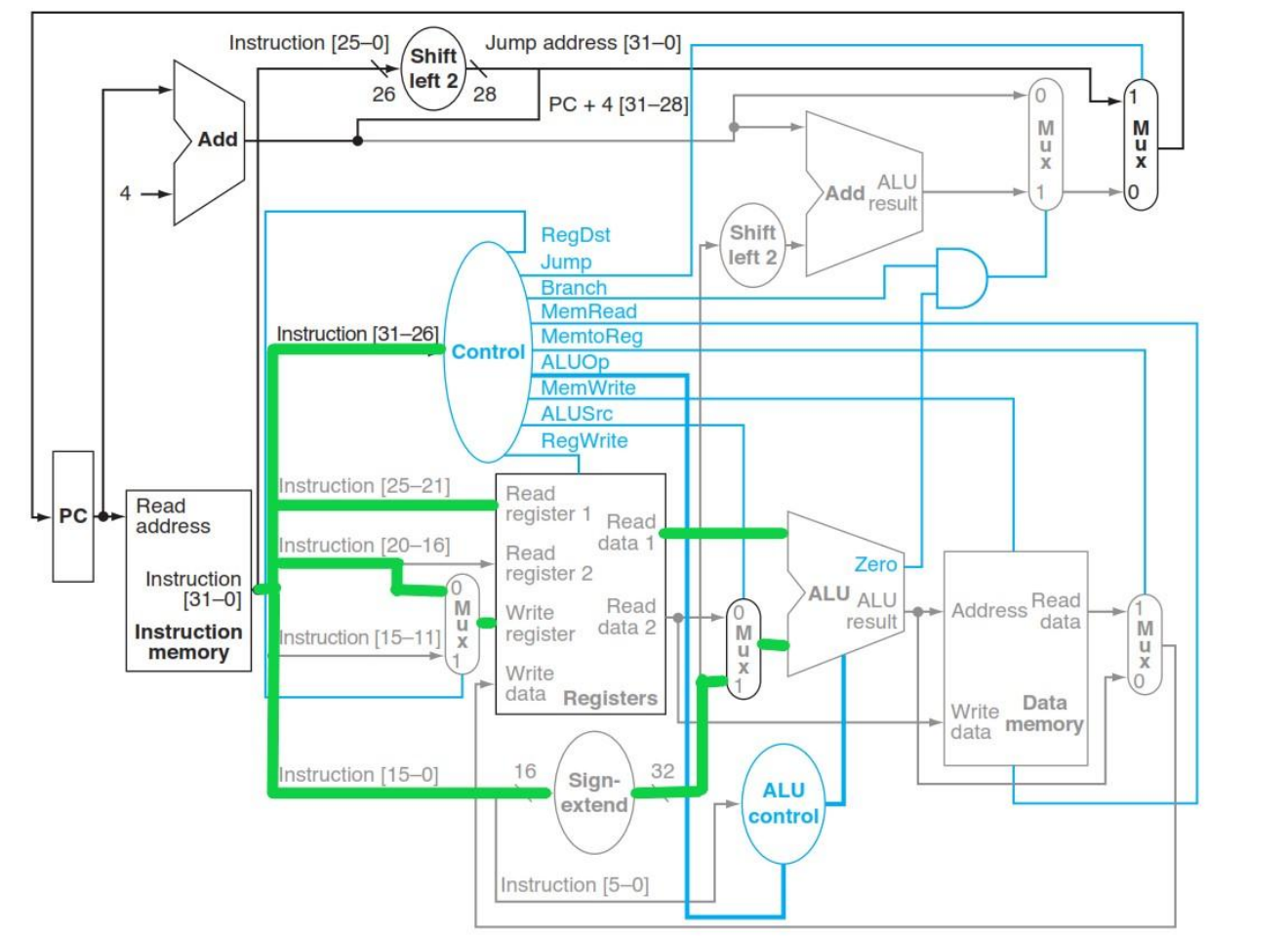
Exemplo (ADD – type R)



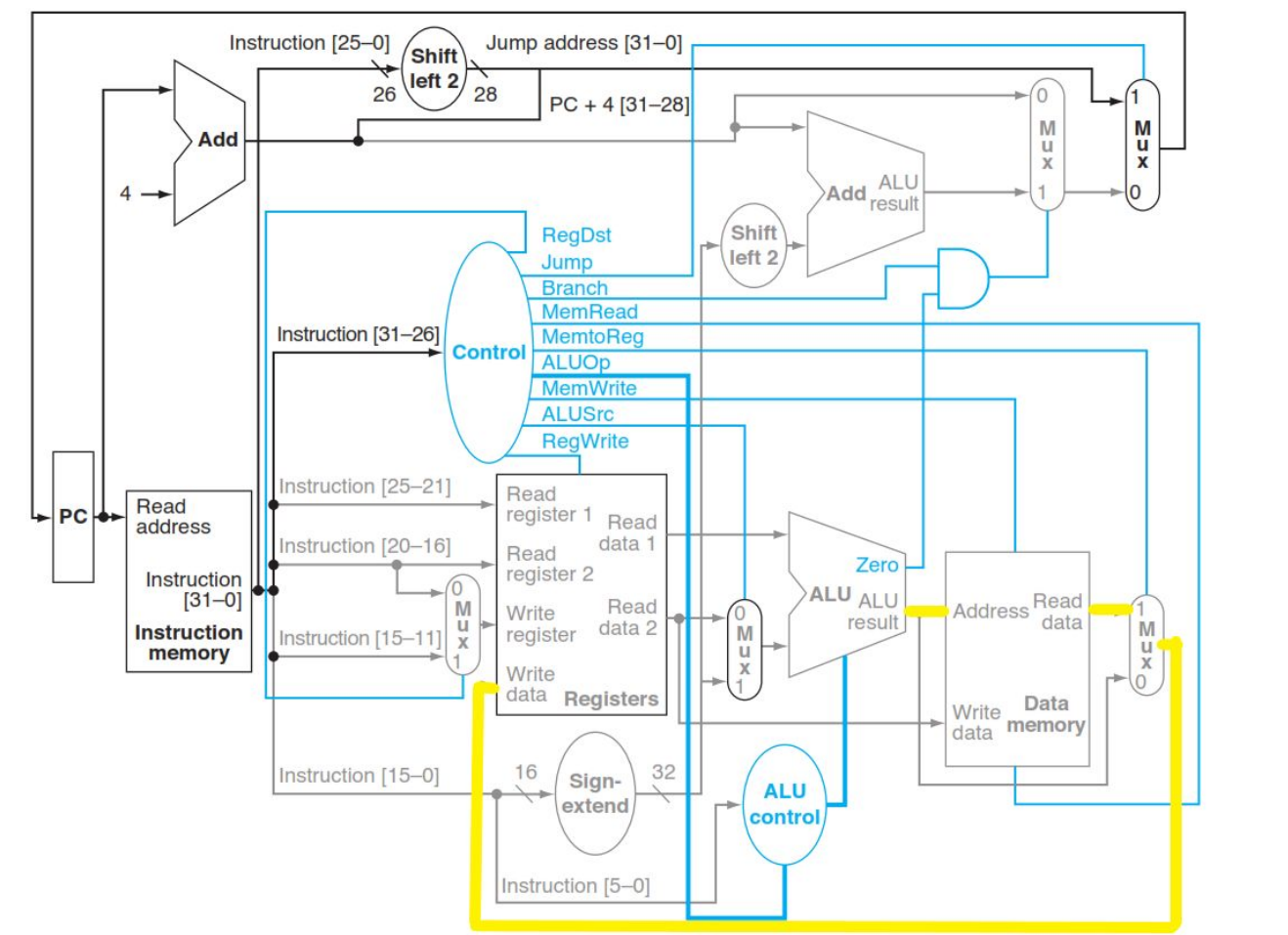
Exemplo (ADD – type R)



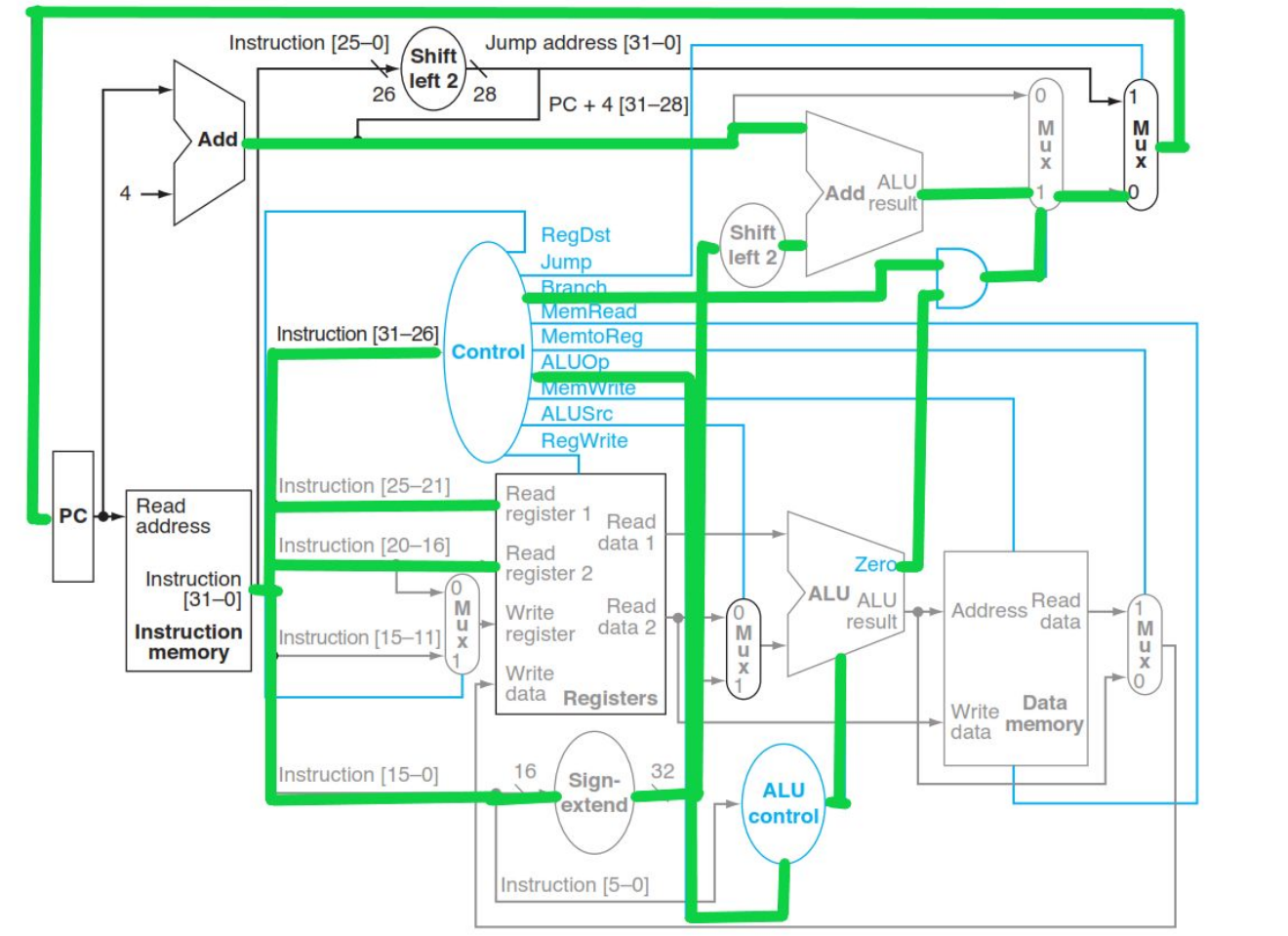
Exemplo (LW – type I)



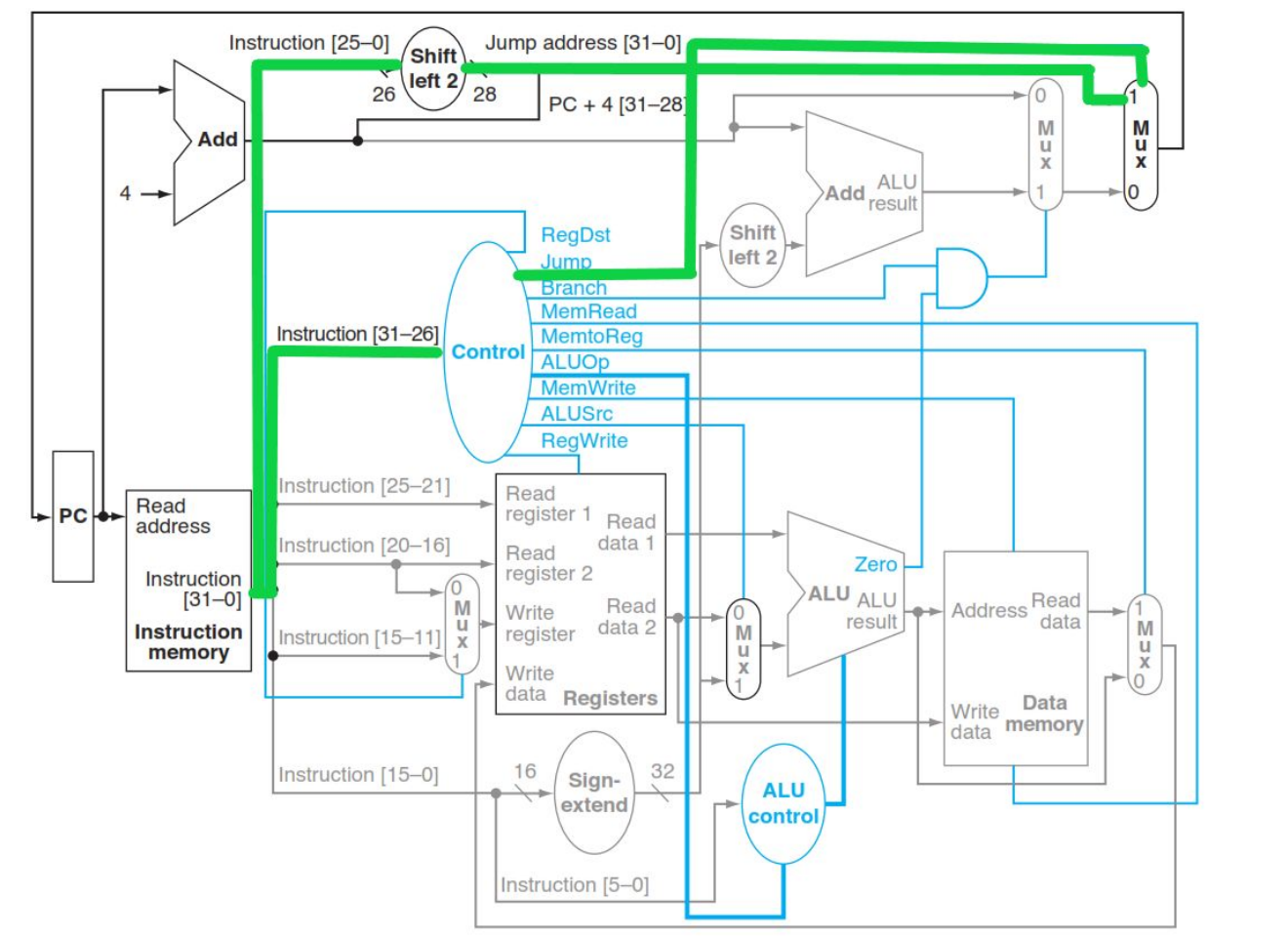
Exemplo (LW – type I)



Exemplo (BEQ – type I)



Exemplo (J – type J)



Exemplo (J – type J)