Processador 8 bits

Trabalho final AOC

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Tipos de instrução

- Tipo R

3 bits	2 bits	2 bits	1 bit
7-5	4-3	2-1	0
Opcode	Reg1	Reg2	Funct

Tipos de instrução

- Tipo I

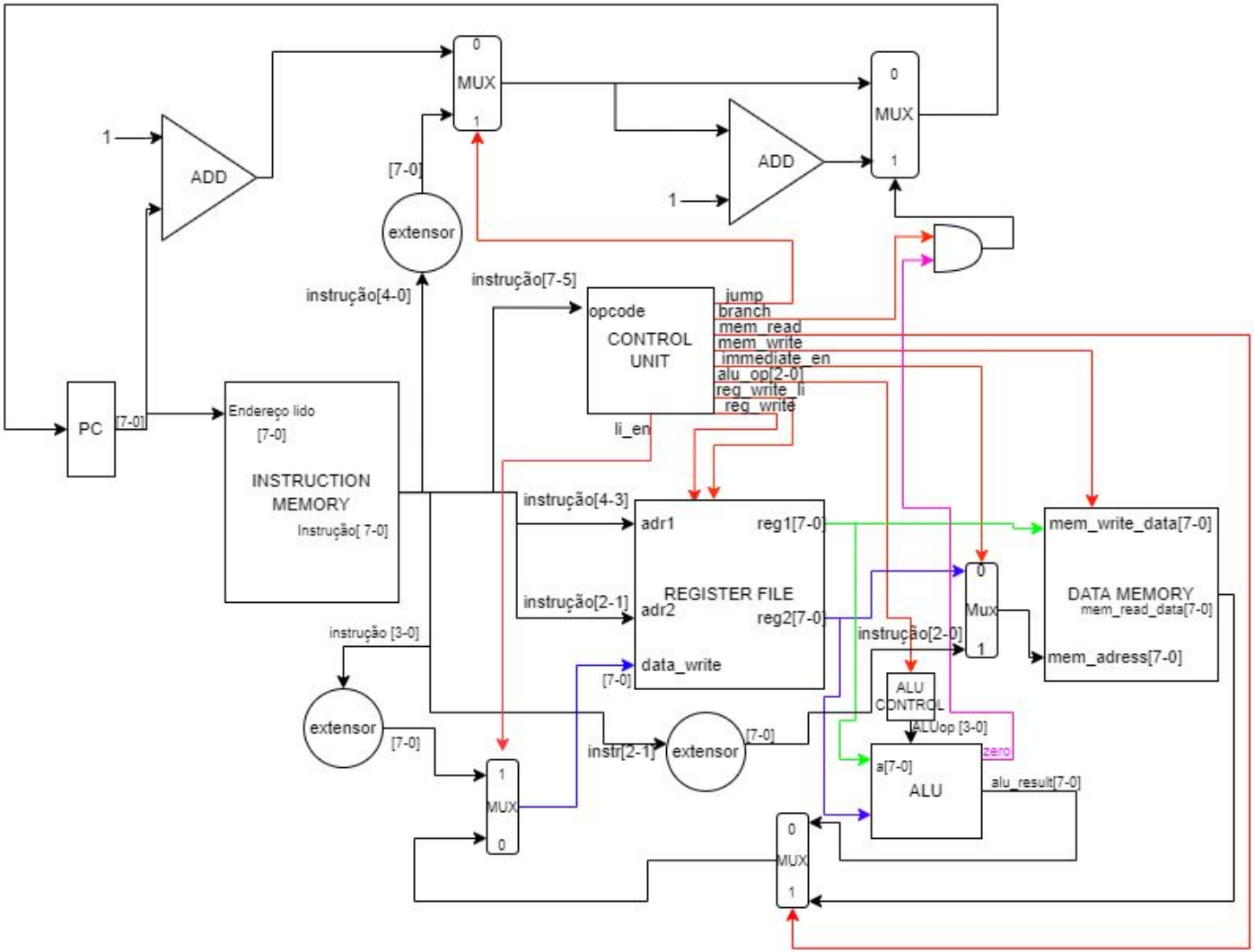
3 bits	2 bits	2 bits	1 bit
7-5	4-3	2-1	1
Opcode	Reg1	Reg2 / Immediate	Immediate_en

Tipos de instrução

- Tipo J

3 bits	5 bits
7-5	4-0
Opcode	Target

DataPath


0
MUX
1
1
ADD
[7-0]
extensor
instrução[4-0]
instrução[7-5]
opcode
CONTROL
UNIT
jump
branch
mem_read
mem_write
immediate_en
alu_op[2-0]
reg_write_li
reg_write
li_en
ADD
1
0
MUX
1
PC
[7-0]
Endereço lido
[7-0]
INSTRUCTION
MEMORY
Instrução[7-0]
instrução[4-3]
instrução[2-1]
adr1
adr2
REGISTER FILE
reg1[7-0]
reg2[7-0]
data_write
[7-0]
mem_write_data[7-0]
DATA MEMORY
mem_read_data[7-0]
mem_adress[7-0]
0
Mux
1
instrução [3-0]
instrução[2-0]
ALU
CONTROL
ALUop [3-0]
zero
extensor
[7-0]
instr[2-1]
extensor
[7-0]
a[7-0]
ALU
alu_result[7-0]
1
MUX
0
0
MUX
1

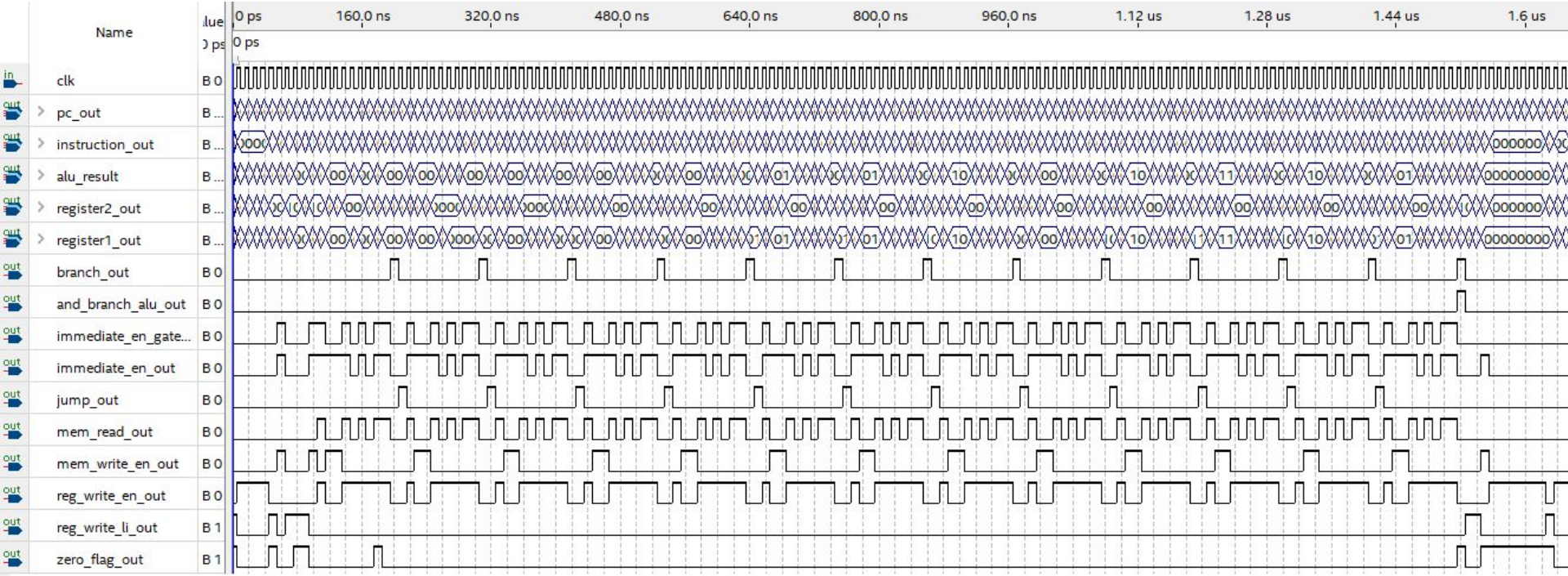
Algoritmo

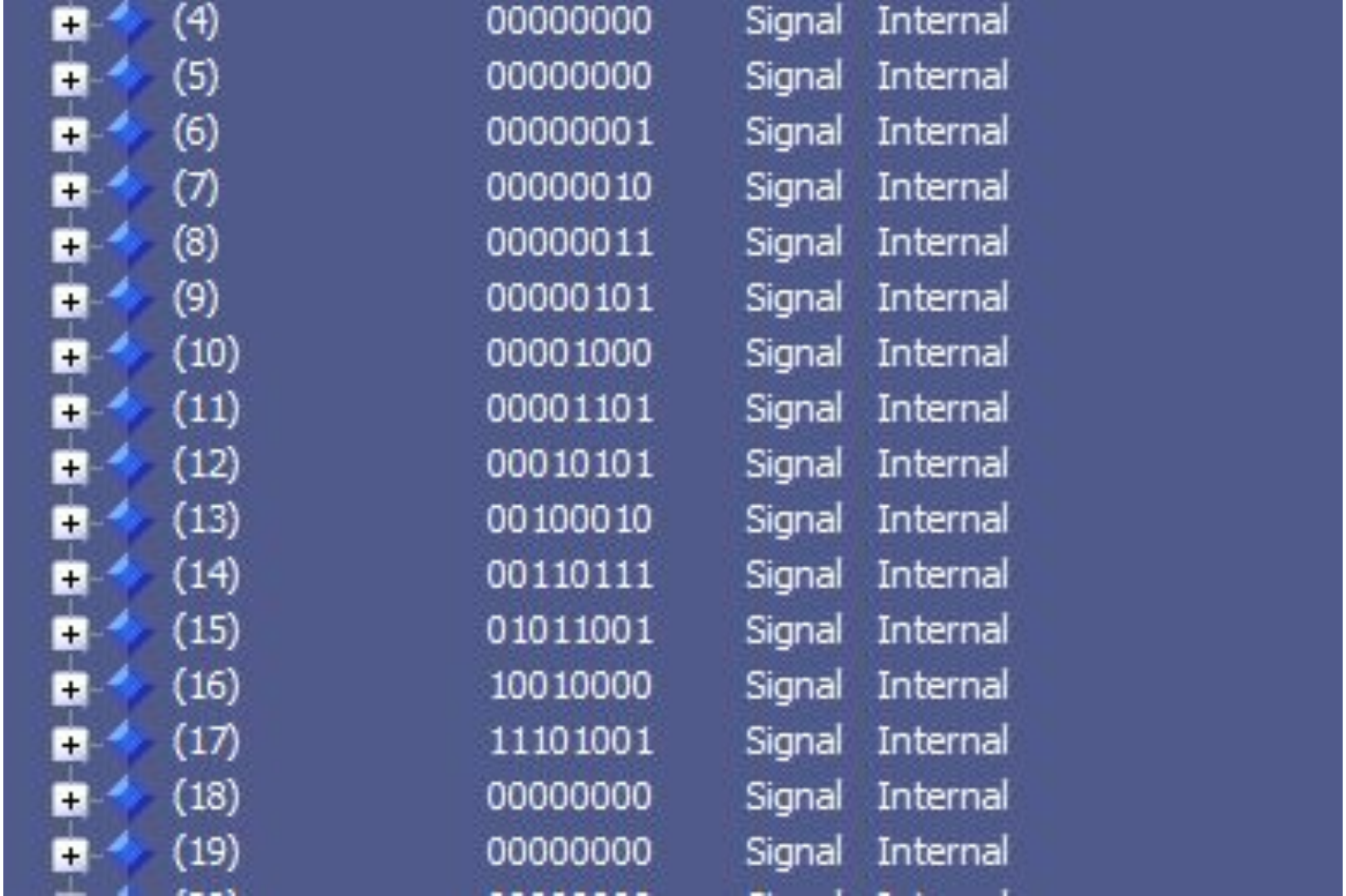
Fibonacci

0	**li $0, 7**	111	00	111	
1	**add $0, $0**	000	00	00	0
2	**add $0, $0**	000	00	00	00
3	**add $0, $0**	000	00	00	00
4	**add $0, $0**	000	00	00	00
5	**li $1, 3**	111	01	011	
6	**sw $0, 3**	110	00	11	1
7	**li $1, 1**	111	01	001	
8	**li $2, 0**	111	10	000	
9	**li $3 5**	111	11	101	
10	**sw $1, 0**	110	01	00	1
11	**lw $0, 0**	101	00	00	1
12	**sw $1, $0**	110	01	00	0
13	**sw $1, $3**	110	01	11	0
14	**lw $1, 0**	101	01	00	1
15	**add $3, $0**	000	11	00	0
16	**lw $1, 1**	101	01	01	1
17	**add $1, $2**	000	01	10	0
18	**lw $2, 1**	101	10	01	1
19	**lw $0, 3**	101	00	11	1
20	**slt $1, $0**	100	01	00	0
21	**j 12**	001	01011		
22	**li $0, 0**	111	00	000	
23	**li $1, 5**	111	01	101	
24	**sw $0, $1**	110	00	01	0

Waveform

Fibonacci




(4) 00000000 Signal Internal
(5) 00000000 Signal Internal
(6) 00000001 Signal Internal
(7) 00000010 Signal Internal
(8) 00000011 Signal Internal
(9) 00000101 Signal Internal
(10) 00001000 Signal Internal
(11) 00001101 Signal Internal
(12) 00010101 Signal Internal
(13) 00100010 Signal Internal
(14) 00110111 Signal Internal
(15) 01011001 Signal Internal
(16) 10010000 Signal Internal
(17) 11101001 Signal Internal
(18) 00000000 Signal Internal
(19) 00000000 Signal Internal