

Datapath :

jr	0	0	0	0	0	0	0	0	1	1	0
jal	2	1	0	0	0	0	0	0	0	1	1

Alu controller:

Alu op	Func	Operation
00	Xxxxxx	0
1	Xxxxxx	1
2	Xxxxxx	4
3	000001	0
	000010	2
	000100	2
	001000	3
	010000	4

کد تست برنامه :

```
A = mem[1000]
Mem[2004] = 0
For(i=19; i!=0; i--)
    C=i+i
    C= C+C
    B = mem[1000+c]
    If( B >A)
        A = B
        Mem[2004] = i
Mem[2000] = A
```

0	Ld R1, R0, 1000	000011 00000 00001 0000001111101000
1	Sw R0, R0, 2004	000100 00000 00000 0000011111010100
2	Addi R5, R0, 19	000001 00000 00101 00000000000010011
3	Beq R5, R0, 10	000101 00101 00000 00000000000001010
4	Add R4, R5, R5	000000 00101 00101 00100 00000 000001
5	Add R4, R4, R4	000000 00100 00100 00100 00000 000001
6	Ld R2, R4, 1000	000011 00100 00010 0000001111101000
7	Stl R3, R2, R1	000000 00010 00001 00011 00000 010000
8	Beq R3, R0, 1	000101 00011 00000 00000000000000001
9	Jump 12	000110 00000000000000000000000000001100
10	Add R1, R2, R0	000000 00010 00000 00001 00000 000001
11	Sw R5, R0, 2004	000100 00000 00101 0000011111010100
12	Addi R5, R5, -1	000001 00101 00101 11111111111111111
13	Jump 3	000110 000000000000000000000000000011
14	Sw R1, R0, 2000	000100 00000 00001 0000011111010000

Ld R1, R0, 1000

Sw R0, R0, 2004

Addi R5, R0, 19

Beq R5, R0, 14

Add R4, R5, R5

Add R4, R4, R4

Ld R2, R4, 1000

Stl R3, R2, R1

Beq R3, R0, 10

Jump 12

Sw R5, R0, 2004

Jump 3

Sw R1, R0, 2000

