Computer Architecture Lab

Lab11 – Week #11

MPLAB Media Processing Laboratory

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ALU forwarding

Table 2 – Signals for M_TEXT_FWD.txt

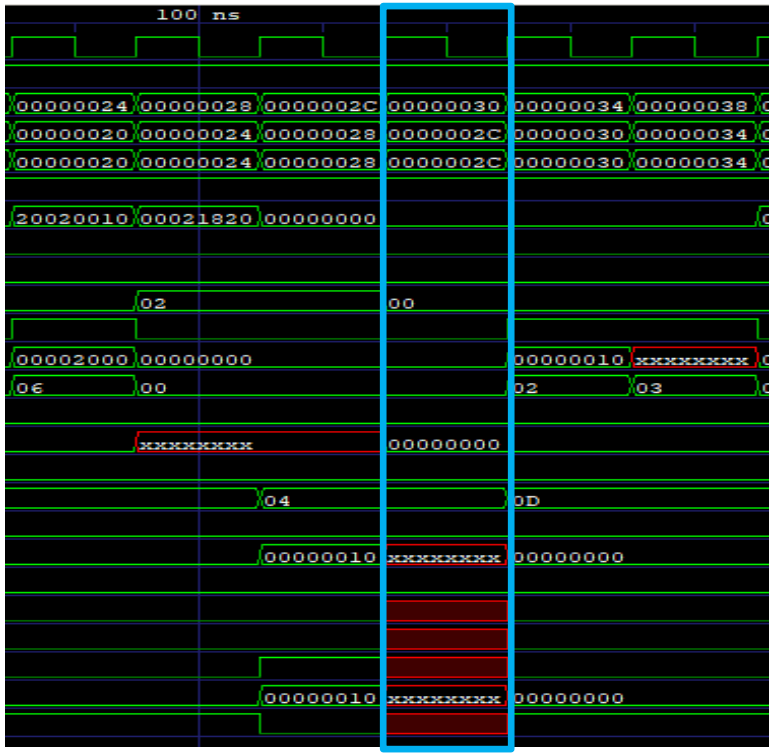
Signal Names	Descriptions
FWD_ALU_Ai	**00:** From Register file of ID stage to EX stage **01:** From ALU output of MM stage **10:** From Writeback data of WB stage
FWD_ALU_Bi	**00:** From Register file of ID stage to EX stage **01:** From ALU output of MM stage **10:** From Writeback data of WB stage
* For both signals, 11 is not allowed.	

ALU forwarding

- ✓ example - Data hazard

```
main:
        lui     $6, 0x0000
        nop
        nop
        nop
        ori     $6, $6, 0x2000
        nop
        nop
        nop
        addi    $2, $0, 0x10
        add     $3, $0, $2
        nop
        nop
        nop
        nop
```

addi mem
add ex



ALU forwarding

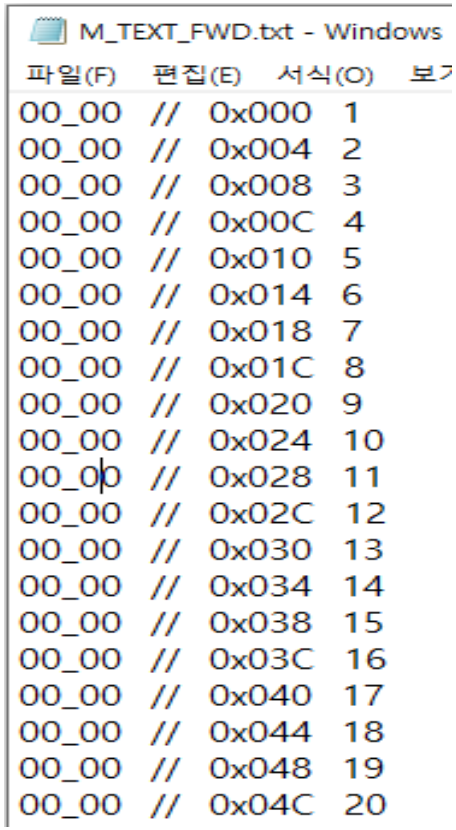
B port forwarding 필요!

ALU forwarding

M_TEXT_SEG.txt

lui
ori
addi
add

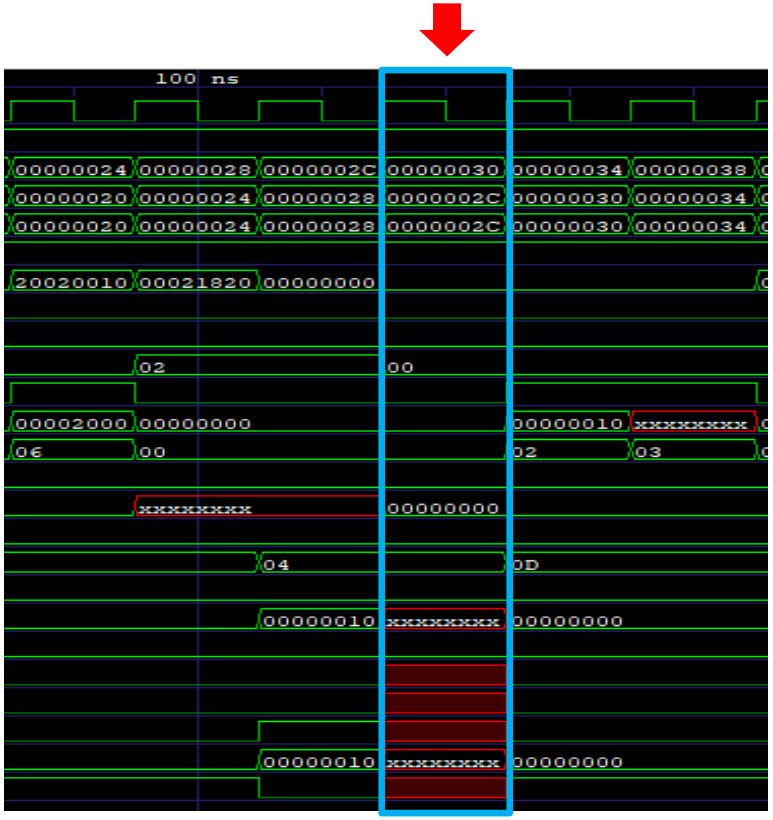
```
1  00111100000001100000000000000000
2  00000000000000000000000000000000
3  00000000000000000000000000000000
4  00000000000000000000000000000000
5  00110100110001100010000000000000
6  00000000000000000000000000000000
7  00000000000000000000000000000000
8  00000000000000000000000000000000
9  00100000000001000000000000010000
10 00000000000001000011000000100000
11 00000000000000000000000000000000
12 00000000000000000000000000000000
13 00000000000000000000000000000000
14 00000000000000000000000000000000
15 00000000100001100100000000100010
16 00000000000000000000000000000000
17 00000000000000000000000000000000
18 00000000000000000000000000000000
19 00000000000000000000000000000000
```



- line number or address check!
- add인 10번 라인, 0x024의 B port에 forwarding signal 설정

ALU forwarding

addi mem
add ex



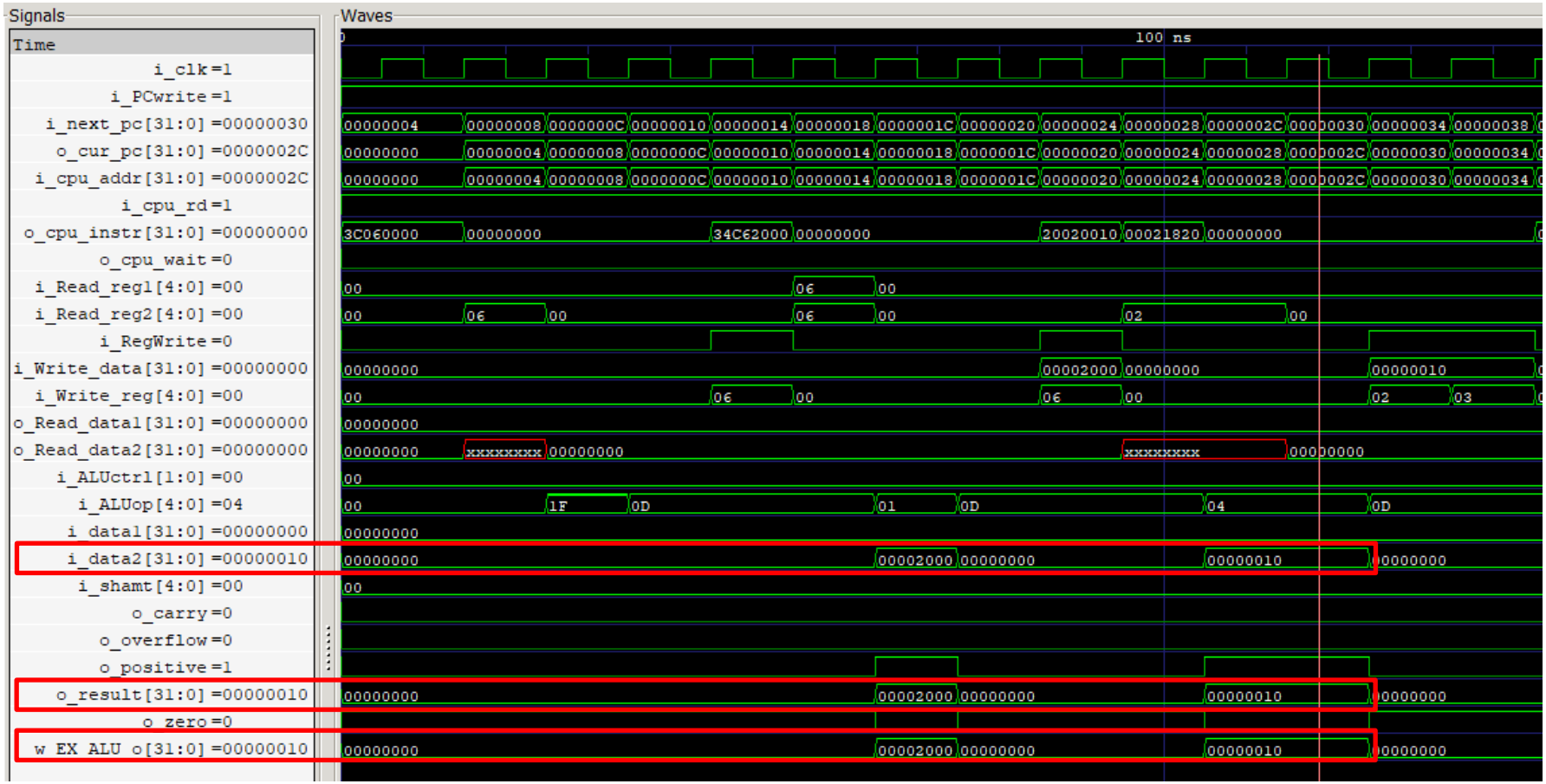
- add의 ex stage에서 addi는 mem stage이므로 B port에 01 설정

M_TEXT_FWD.txt - Windows 메모장

파일(F) 편집(E) 서식(O) 보기(V) 도

```
00_00  //  0x000  1
00_00  //  0x004  2
00_00  //  0x008  3
00_00  //  0x00C  4
00_00  //  0x010  5
00_00  //  0x014  6
00_00  //  0x018  7
00_00  //  0x01C  8
00_00  //  0x020  9
00_01  //  0x024  10
00_00  //  0x028  11
00_00  //  0x02C  12
00_00  //  0x030  13
00_00  //  0x034  14
00_00  //  0x038  15
00_00  //  0x03C  16
00_00  //  0x040  17
00_00  //  0x044  18
00_00  //  0x048  19
00_00  //  0x04C  20
```

ALU forwarding



Thank You