2022 計算機組織
Computer Organization

Lab 7 Report

系級	電機 114
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1. Architecture Diagram
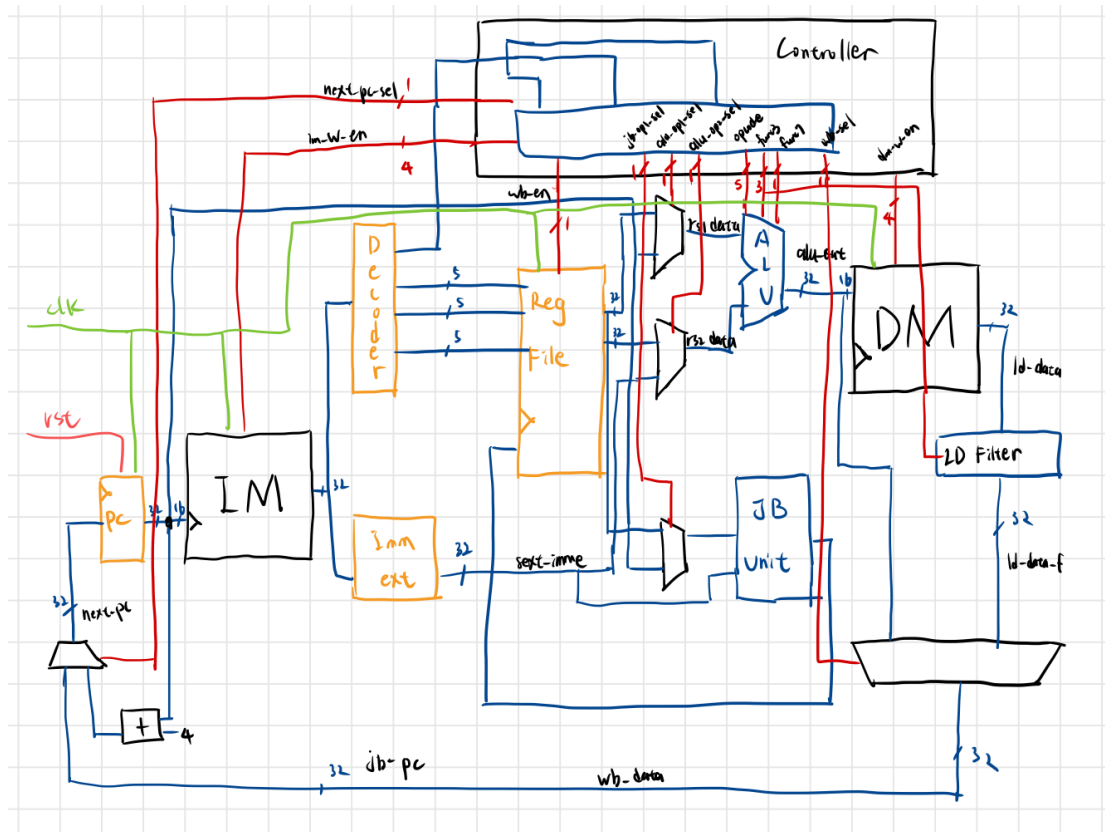
2. Introduce each module (function / corner case / and so on…)

PC_reg: Store the pc address of the present clock

IM: Store all the instructions

Decoder: Break down the whole instruction and then distribute each sub-instructions to those relatively modules

Imm_ext: extent the sign of the immediate numbers according to the present instruction

Reg_File: Registers, store and give data

ALU: Do the arithmetic job according to the present instruction

JB_Unit: Calculate the all the jump pcs

DM: Dram, store results of the processes of the instruction

LD_Filter: Filter the data taking out of DM according to the needs of instructions

Mux: Receive the control signal and chose the correct data path

Controller: Give all the control signal according to the instruction

3. Screenshot the successful result of prog0

```
Done

DM['h9000] = fffffff0, pass
DM['h9004] = fffffff8, pass
DM['h9008] = 00000008, pass
DM['h900c] = 00000001, pass
DM['h9010] = 00000001, pass
DM['h9014] = 78787878, pass
DM['h9018] = 000091a2, pass
DM['h901c] = 00000003, pass
DM['h9020] = fefcfefd, pass
DM['h9024] = 10305070, pass
DM['h9028] = cccccccc, pass
DM['h902c] = ffffffcc, pass
DM['h9030] = ffffcccc, pass
```

```
DM['h9034] = 000000cc, pass
DM['h9038] = 0000cccc, pass
DM['h903c] = 00000d9d, pass
DM['h9040] = 00000004, pass
DM['h9044] = 00000003, pass
DM['h9048] = 000001a6, pass
DM['h904c] = 00000ec6, pass
DM['h9050] = 2468b7a8, pass
DM['h9054] = 5dbf9f00, pass
DM['h9058] = 00012b38, pass
DM['h905c] = fa2817b7, pass
DM['h9060] = ff000000, pass
DM['h9064] = 12345678, pass
DM['h9068] = 0000f000, pass
DM['h906c] = 00000f00, pass
DM['h9070] = 000000f0, pass
DM['h9074] = 0000000f, pass
DM['h9078] = 56780000, pass
DM['h907c] = 78000000, pass
DM['h9080] = 00005678, pass
DM['h9084] = 00000078, pass
DM['h9088] = 12345678, pass
DM['h908c] = ce780000, pass
DM['h9090] = fffff000, pass
DM['h9094] = fffff000, pass
DM['h9098] = fffff000, pass
DM['h909c] = fffff000, pass
DM['h90a0] = fffff000, pass
DM['h90a4] = fffff000, pass
DM['h90a8] = 13579d7c, pass
DM['h90ac] = 13578000, pass
DM['h90b0] = fffff004, pass
```

```
        ***************************
        **                       **
        **   Waku Waku !!         **
        **                       **
        **   Simulation PASS !!   **
        **                       **
        ***************************
Simulation complete via $finish(1) at time 6215 NS + 1
./top_tb.sv:115      $finish;
xcelium> exit
TOOL:   xmverilog     22.03-s003: Exiting on Jan 21, 2023 at 21:42:06 CST  (total: 00:00:01)
```

4. Screenshot the successful result of prog1

```
Done

DM['h9000] = 00000000, pass
DM['h9004] = 00000001, pass
DM['h9008] = 00000001, pass
DM['h900c] = 00000003, pass
DM['h9010] = 00000003, pass
DM['h9014] = 00000006, pass
DM['h9018] = 00000008, pass
DM['h901c] = 0000000a, pass
DM['h9020] = 0000000a, pass
DM['h9024] = 0000000b, pass
DM['h9028] = 0000000c, pass
DM['h902c] = 0000000f, pass
DM['h9030] = 00000010, pass
DM['h9034] = 00000012, pass
DM['h9038] = 00000012, pass
DM['h903c] = 00000017, pass
DM['h9040] = 00000017, pass
DM['h9044] = 00000017, pass
DM['h9048] = 00000018, pass
DM['h904c] = 0000001b, pass
DM['h9050] = 0000001e, pass
DM['h9054] = 00000025, pass
DM['h9058] = 00000025, pass
DM['h905c] = 00000026, pass
DM['h9060] = 00000027, pass
DM['h9064] = 00000028, pass
DM['h9068] = 00000028, pass
DM['h906c] = 00000029, pass
DM['h9070] = 0000002b, pass
DM['h9074] = 0000002d, pass
DM['h9078] = 0000002d, pass
DM['h907c] = 0000002e, pass
DM['h9080] = 0000002f, pass
DM['h9084] = 00000031, pass
DM['h9088] = ffffffce, pass
DM['h908c] = ffffffce, pass
DM['h9090] = ffffffd1, pass
DM['h9094] = ffffffd1, pass
DM['h9098] = ffffffd2, pass
DM['h909c] = ffffffe2, pass
DM['h90a0] = ffffffe9, pass
DM['h90a4] = ffffffea, pass
DM['h90a8] = ffffffeb, pass
DM['h90ac] = ffffffed, pass
DM['h90b0] = ffffffef, pass
DM['h90b4] = fffffff3, pass
DM['h90b8] = fffffff7, pass
```

```
DM['h90b8] = fffffff7, pass
DM['h90bc] = fffffffa, pass
DM['h90c0] = fffffffa, pass
DM['h90c4] = fffffffd, pass
DM['h90c8] = fffffffe, pass
DM['h90cc] = ffffffff, pass
DM['h90d0] = 00000000, pass
DM['h90d4] = ffffffcf, pass
DM['h90d8] = ffffffd2, pass
DM['h90dc] = ffffffd2, pass
DM['h90e0] = ffffffd4, pass
DM['h90e4] = ffffffd5, pass
DM['h90e8] = ffffffd6, pass
DM['h90ec] = ffffffdb, pass
DM['h90f0] = ffffffe3, pass
DM['h90f4] = ffffffe3, pass
DM['h90f8] = ffffffe8, pass
DM['h90fc] = ffffffe9, pass
DM['h9100] = ffffffee, pass
DM['h9104] = ffffffee, pass
DM['h9108] = ffffffee, pass
DM['h910c] = ffffffef, pass
DM['h9110] = fffffff0, pass
DM['h9114] = fffffffe, pass
DM['h9118] = 00000000, pass
DM['h911c] = 00000000, pass
DM['h9120] = 00000000, pass
DM['h9124] = 00000003, pass
DM['h9128] = 00000009, pass
DM['h912c] = 0000000f, pass
DM['h9130] = 00000013, pass
DM['h9134] = 00000016, pass
DM['h9138] = 00000017, pass
DM['h913c] = 00000017, pass
DM['h9140] = 00000023, pass
DM['h9144] = 0000002e, pass
```

```
****************************
**                        **
**  Waku Waku !!         **;
**                        **
**  Simulation PASS !!    **
**                        **
****************************
Simulation complete via $finish(1) at time 176025 NS + 1
```