

CS 631-01 Analysis and Cache Memory

Lab 05 Q & A

immediates

sign extension

jal

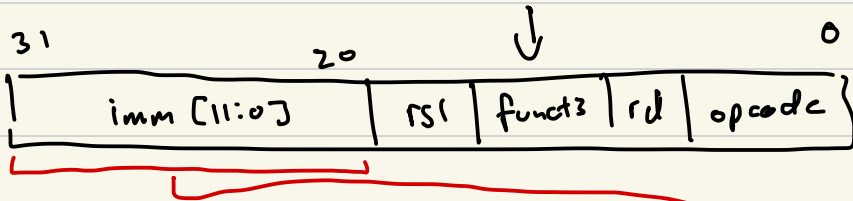
immediates

goal: create a signed 64 bit value
from immediat bits.

Steps

- ① extract immediatz sequences
- ② combine sequences into proper order
- ③ Sign extend to 64 bits

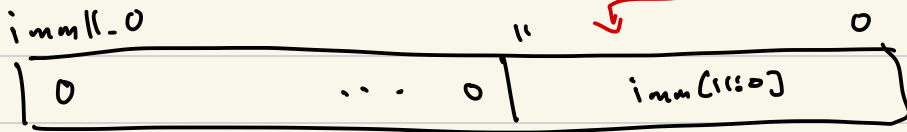
i-type Vint32_t iw;



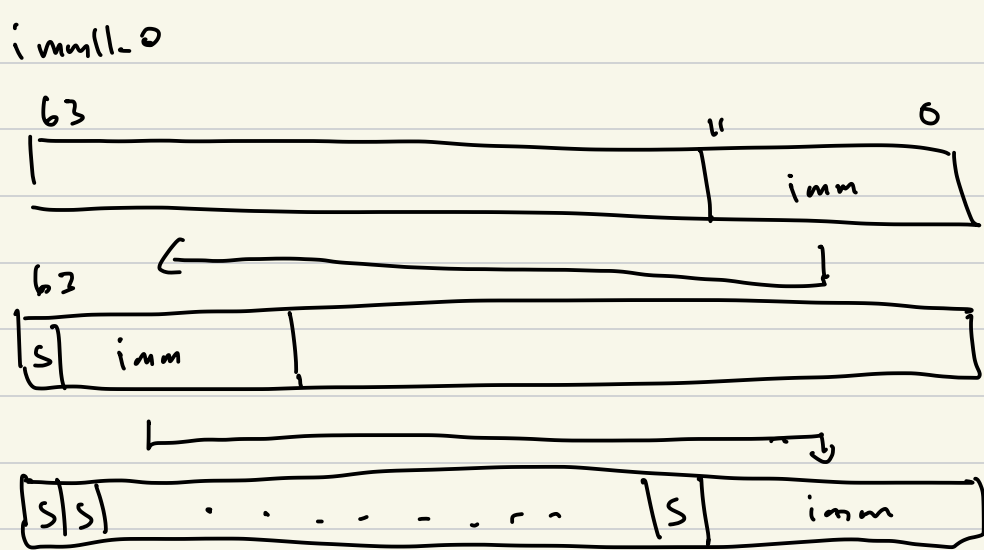
int64_t imm64;

uint64_t imm11_0;

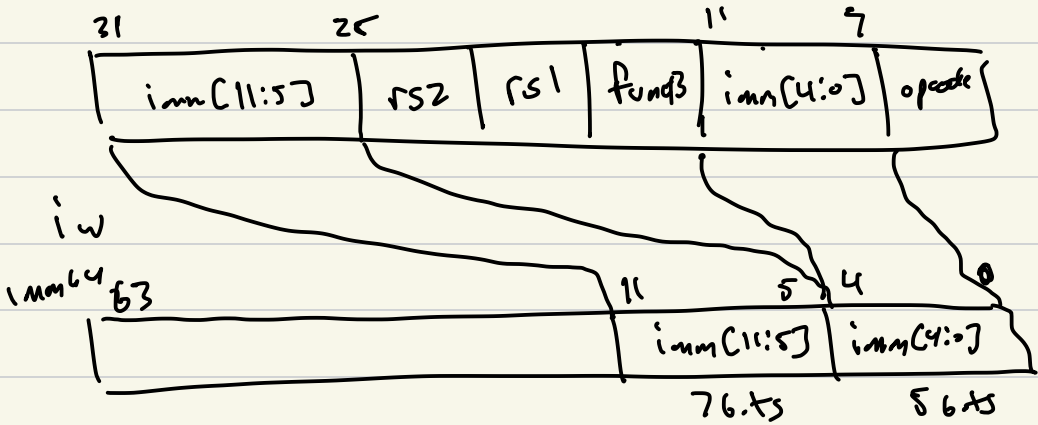
imm11_0 = get_bits(iw, 20, 12);



imm64 = sign_extend(imm11_0, 11);



S type



```
uint64_t imm11_5;  
uint64_t imm4_0;
```

```
imm11_5 = get_bits(iw, 25, 7)  
imm4_0 = get_bits(iw, 7, 5)
```

```
int64_t imm64
```

```
imm64 = (imm11_5 << 5) | imm4_0;
```

```
imm64 = sign_extend(imm64, 11);
```


Project 03 - Full RISC-V Emulator

① Additional Instructions (jal, jalr, auipc)

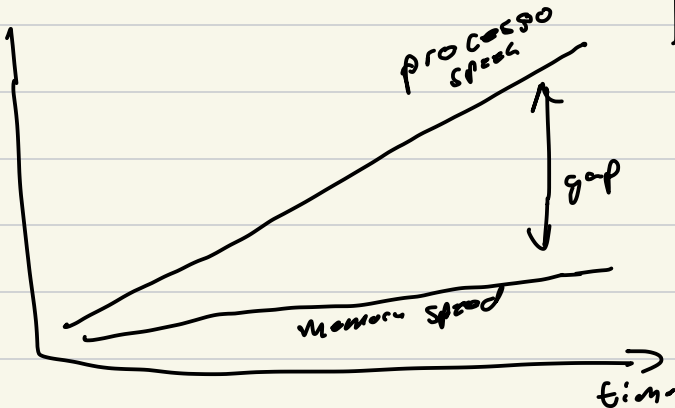
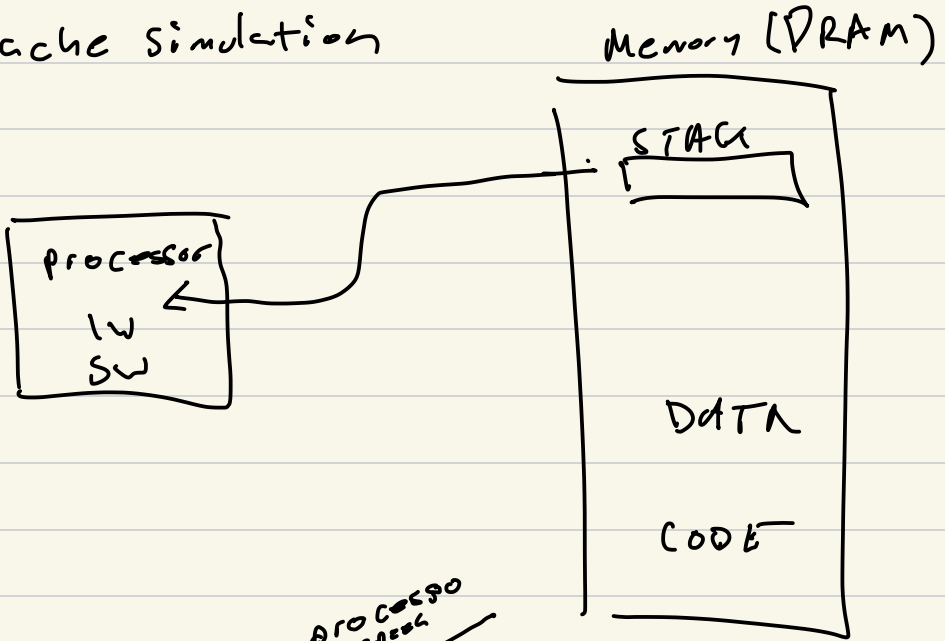
② Dynamic Analysis

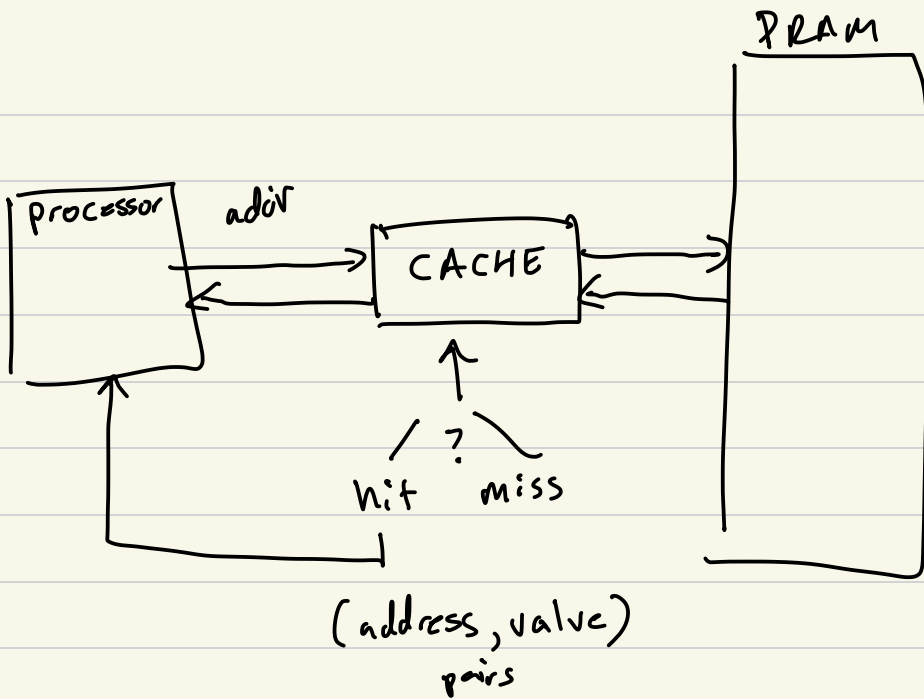
instruction count

branch count

branch not taken

③ Cache simulation





Questions

- 1) Where to look for a given addr?
- 2) How to know if addr is in cache?
- 3) How to resolve a conflict?