CS 315-01 Pipeline Stall and Flush

Data Hazards

Forwarding

```
sub t0,t1,t2
add t3,t0,t0
```

Load stall

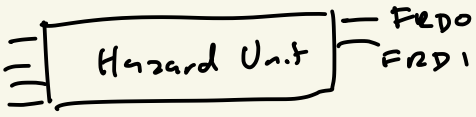
```
ld t0,(t1)
add t2,t0,t0
```

Control Hazards

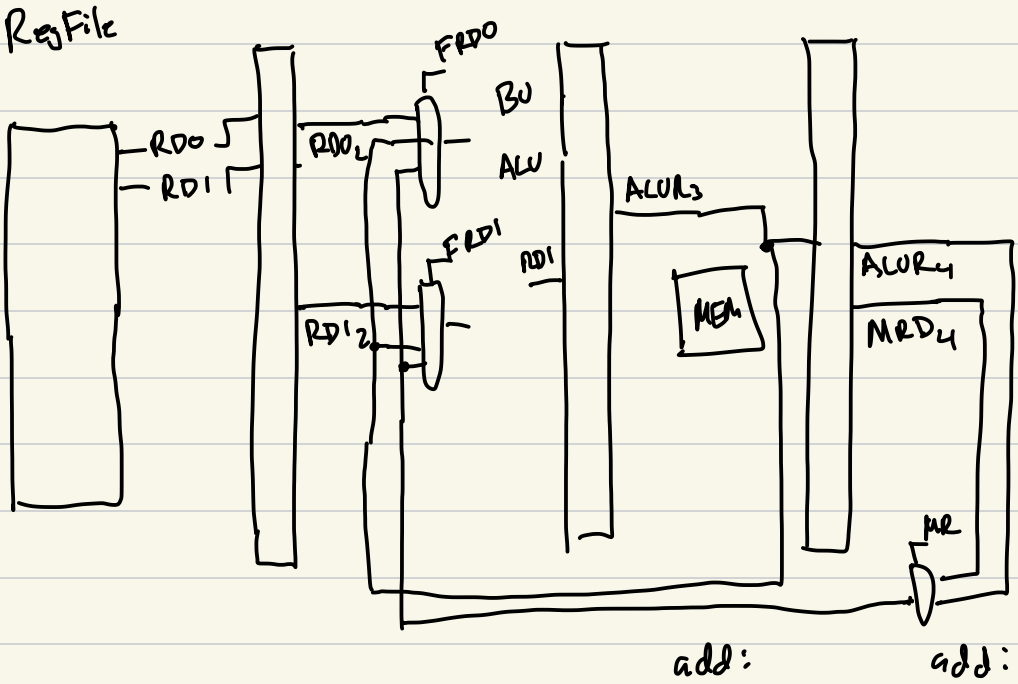
```
add
→ jal foo
→ sub
  add
```

foo:
add: sp,sp,-8

Forwarding



DR(1) EX(2) MEM(3) WB(4)



Load stall

```
ld  t0, (t1)
add t2, t0, t0
```

Load Stall Steps

1) Force CLR in