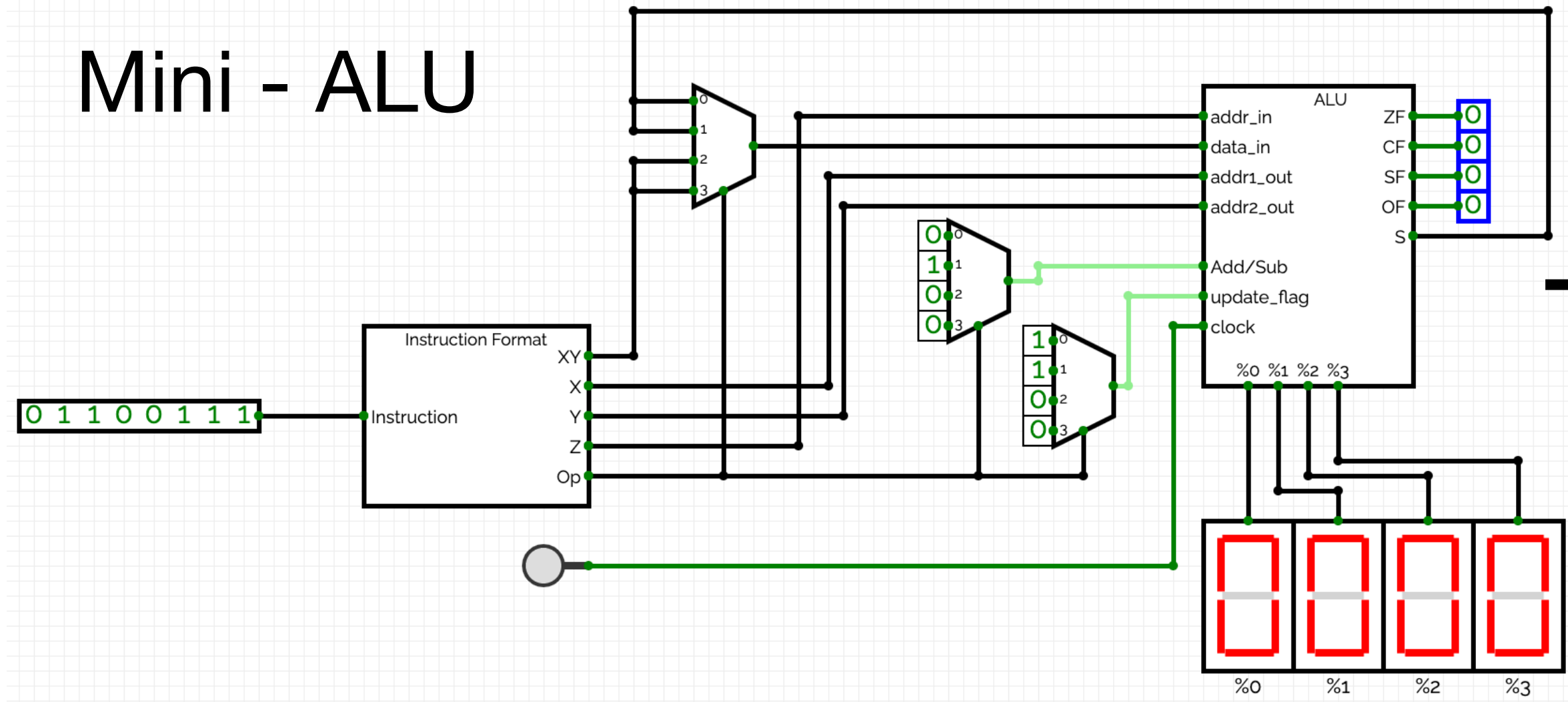


ULM: Ulm Lecture Machine (Bottom-Up Approach)

Preparation for the Exercise "ULM on Paper"

Mini - ALU

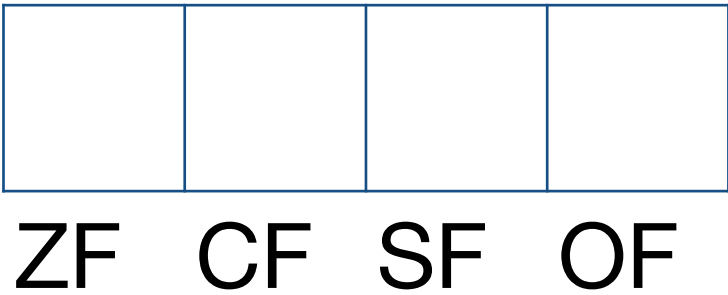
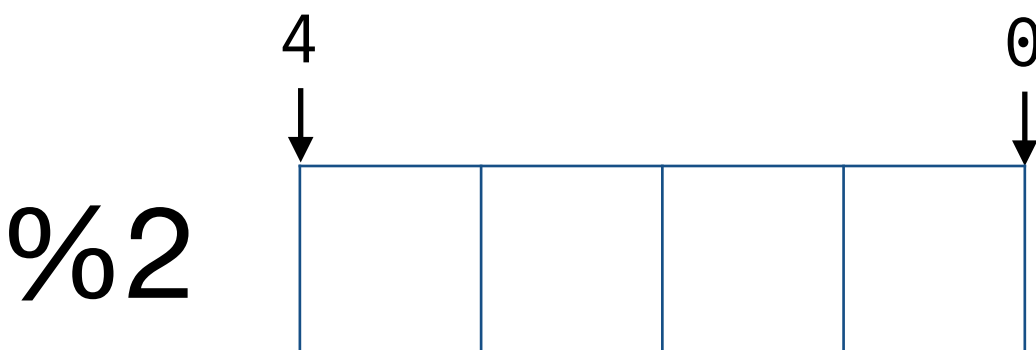
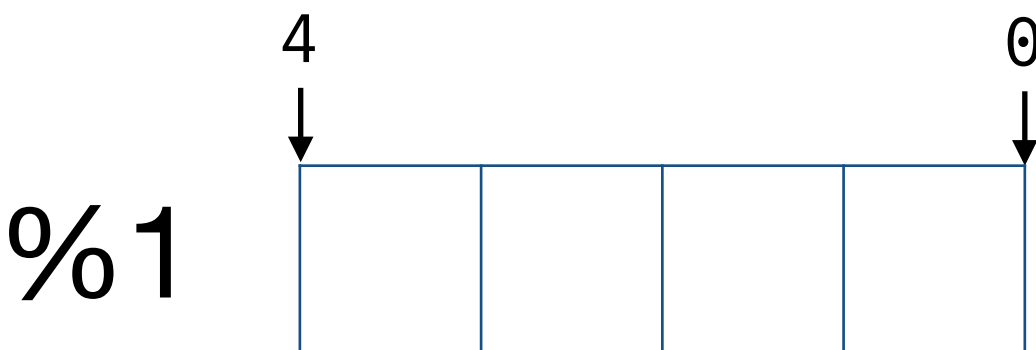
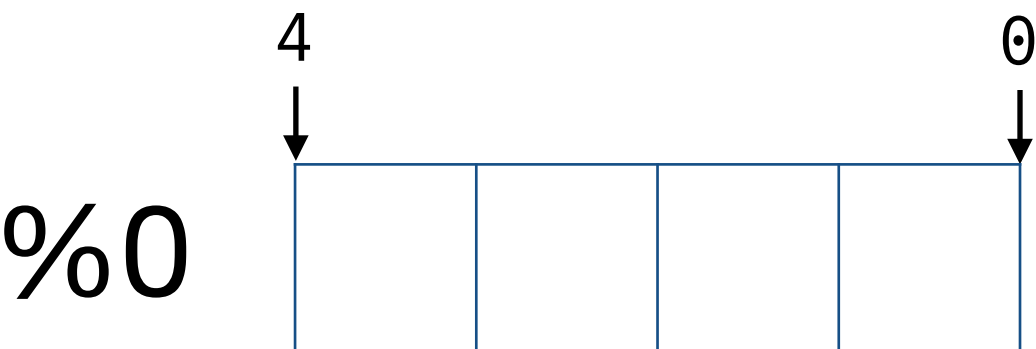


Description of the Instruction Set, etc.

ULM
(Ulm Lecture Machine)

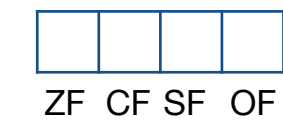
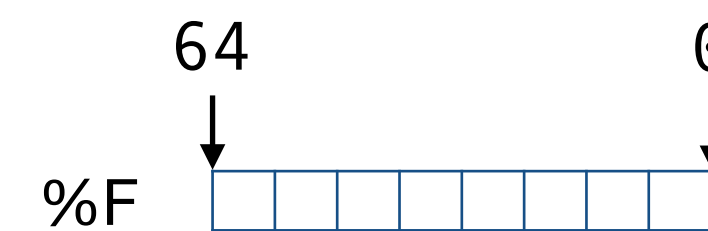
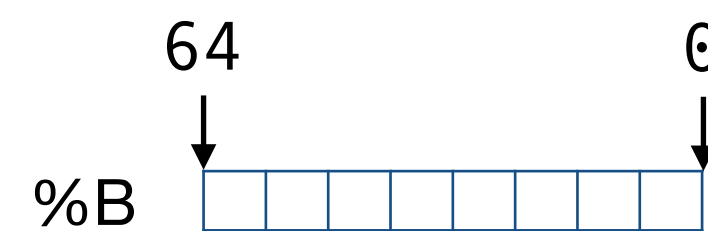
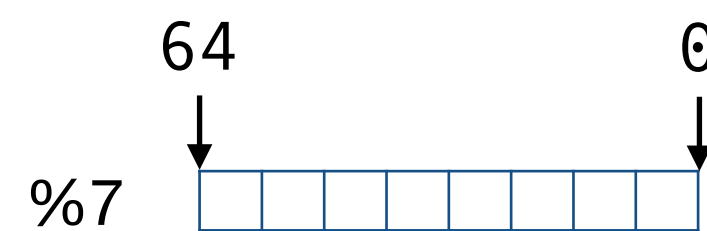
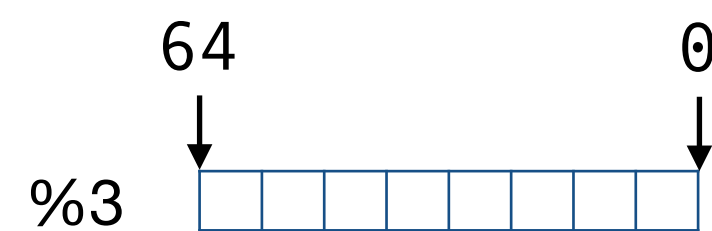
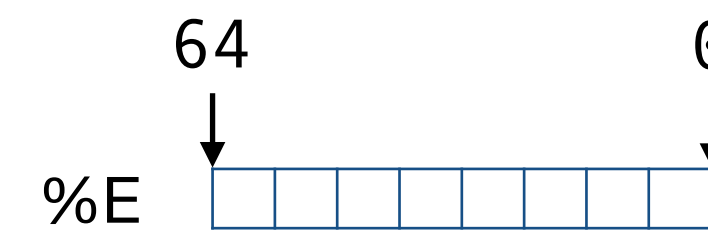
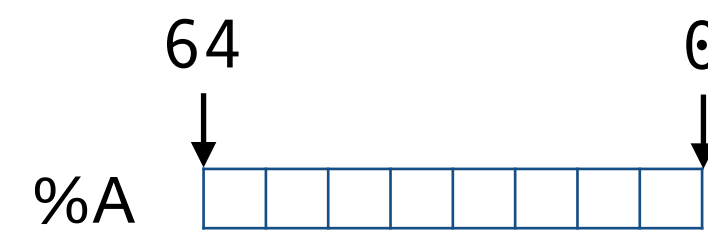
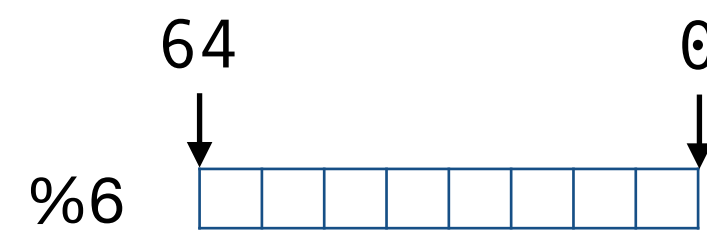
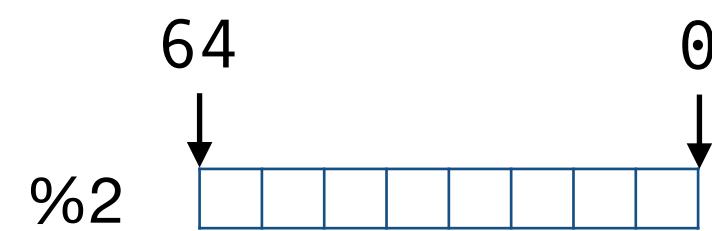
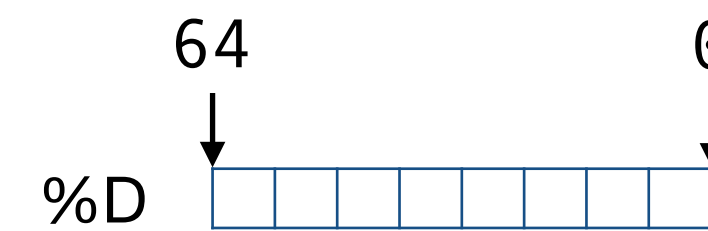
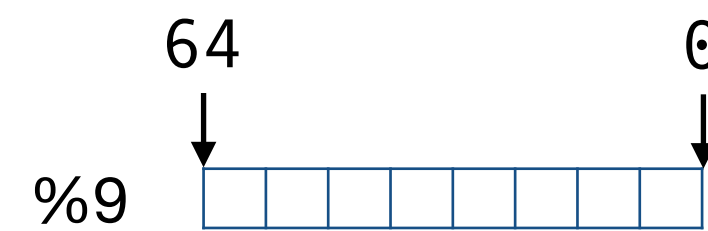
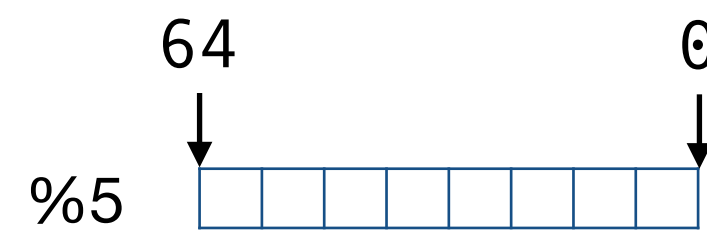
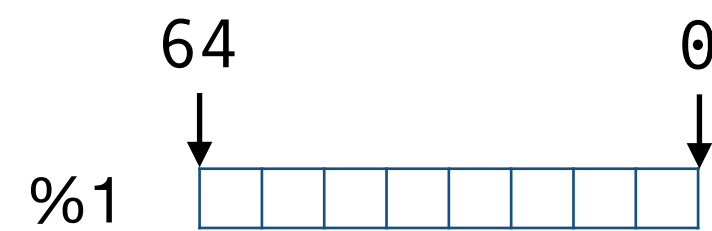
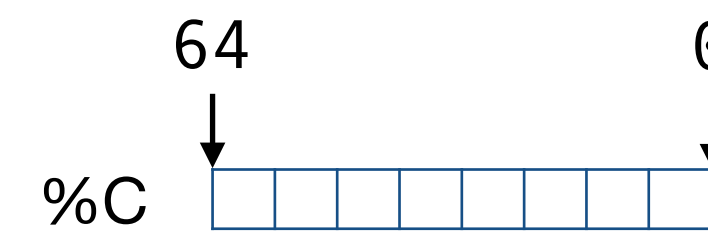
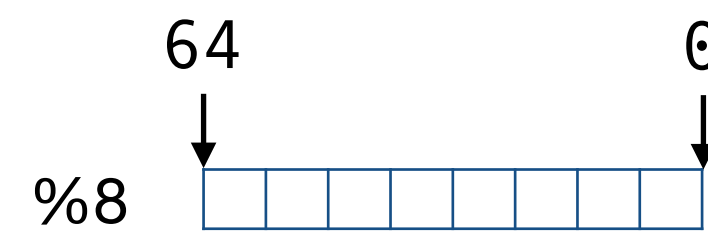
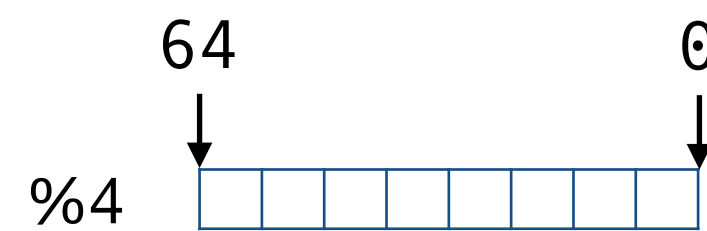
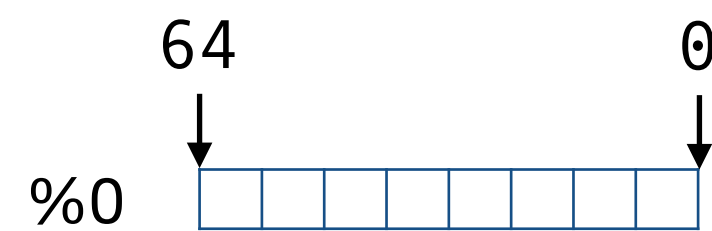
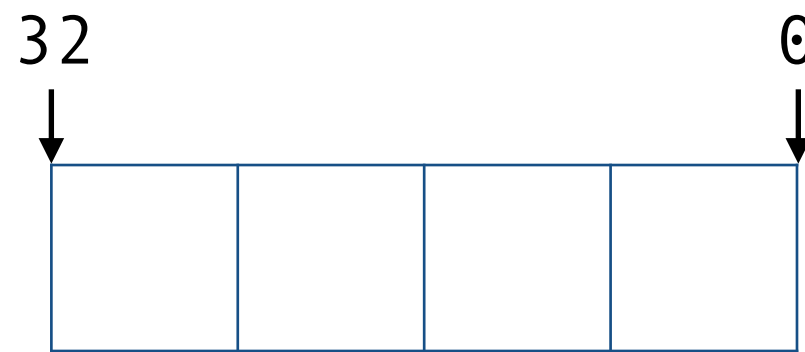
Description of the Instruction Set, etc.

Mini-ALU and Register File



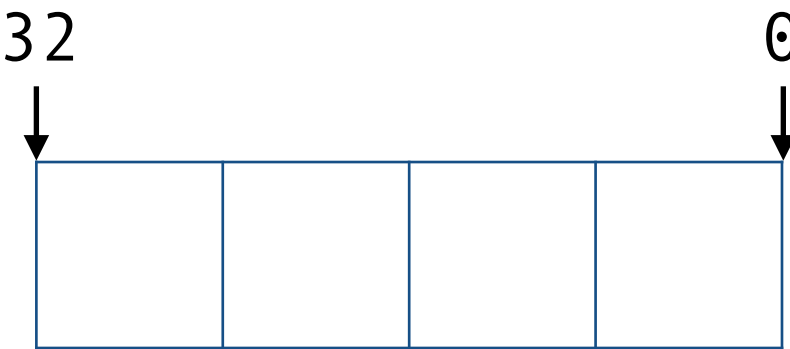
ULM: ALU and Register File

Instruction

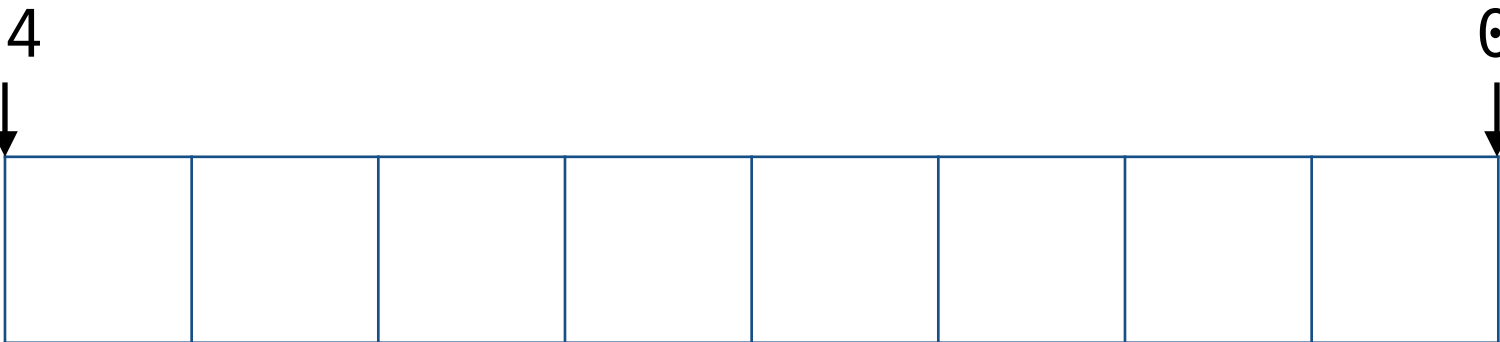


ULM: ALU and Register File

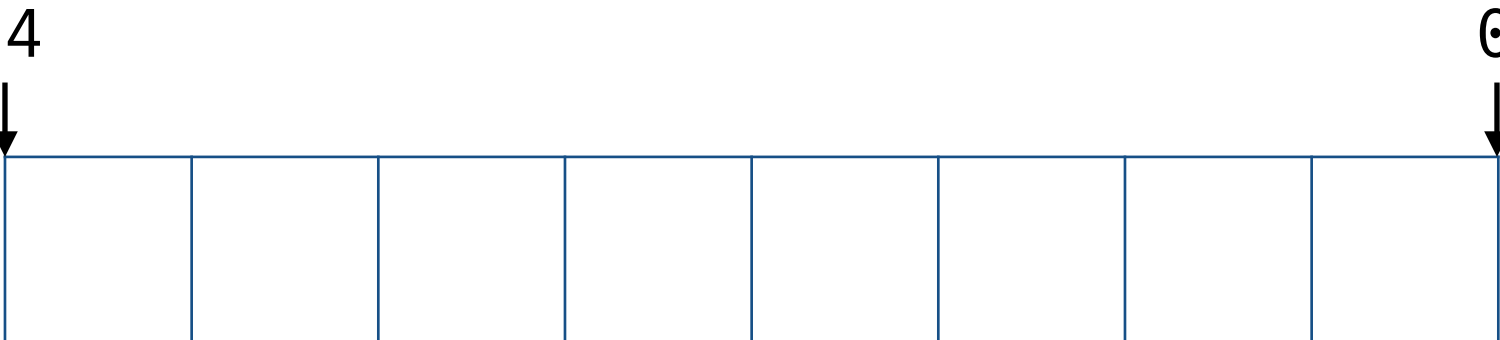
Instruction



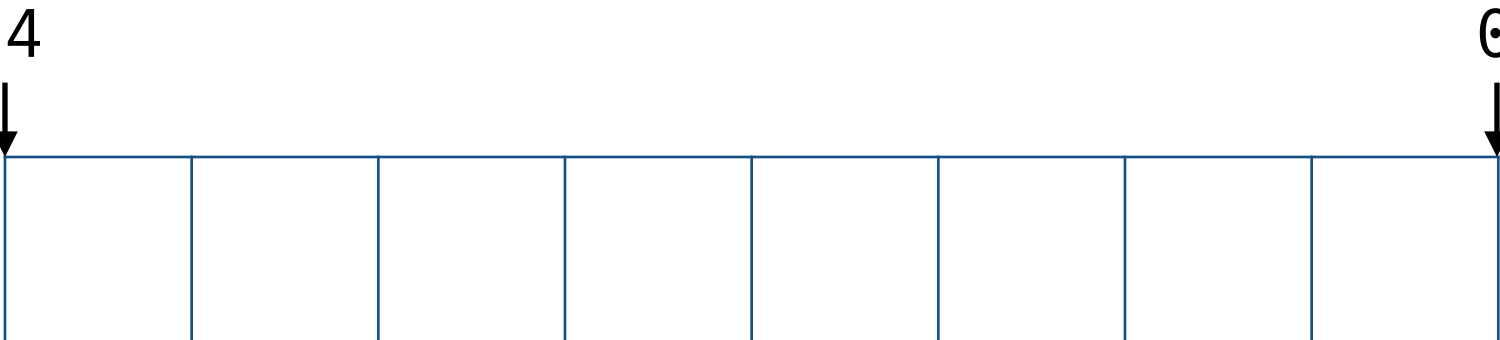
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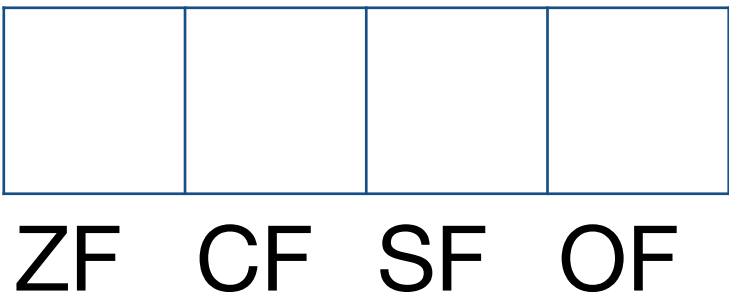
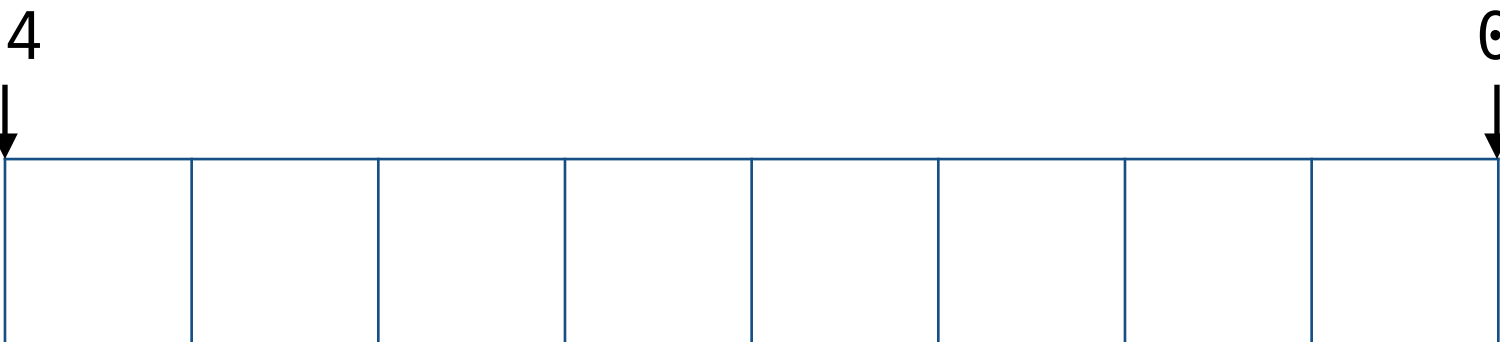
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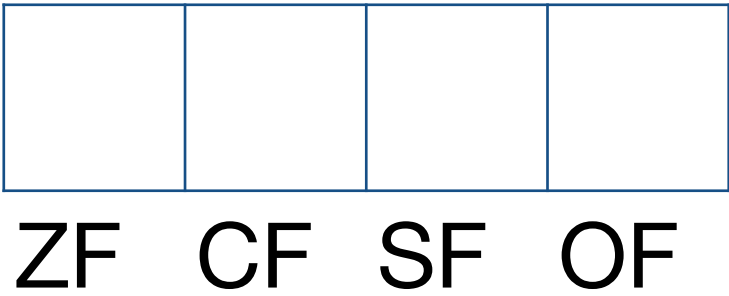
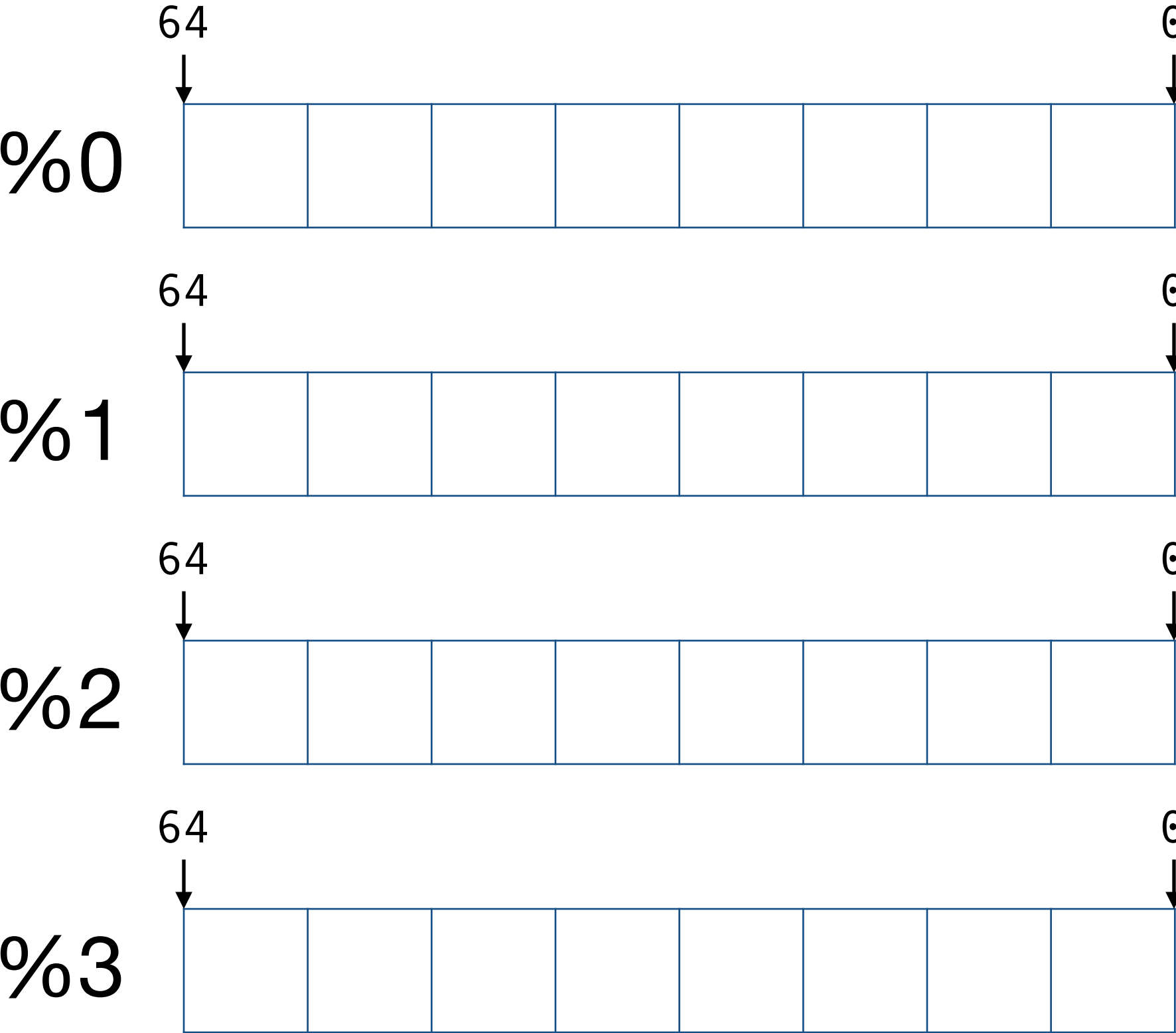
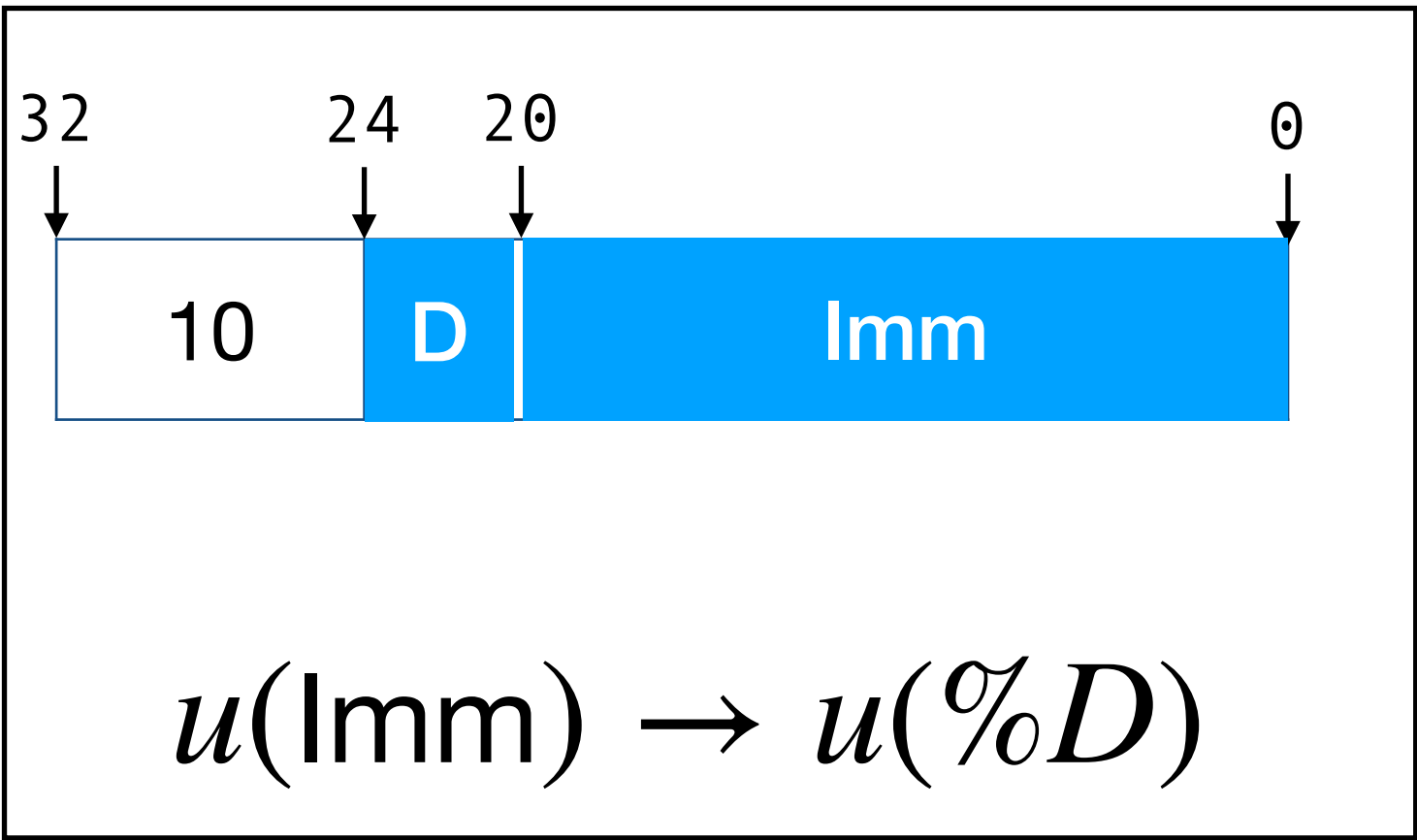
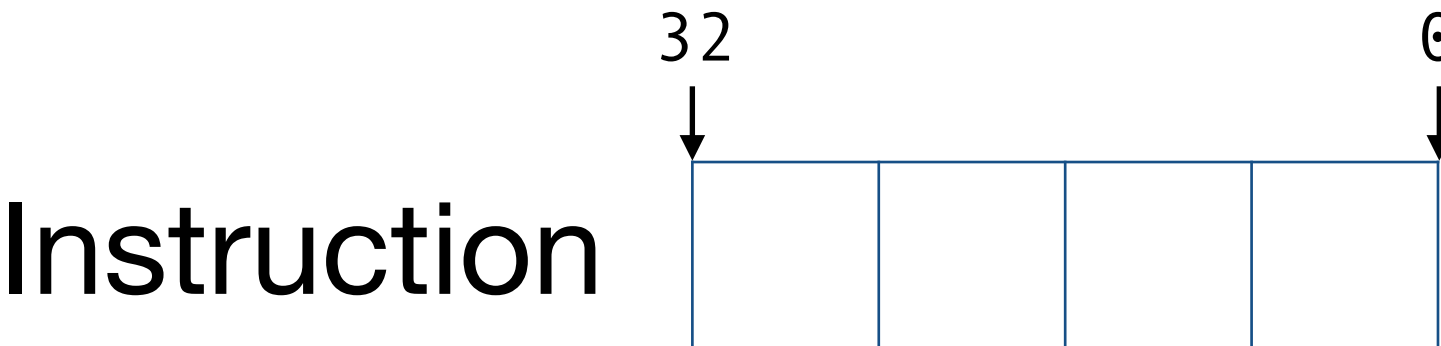
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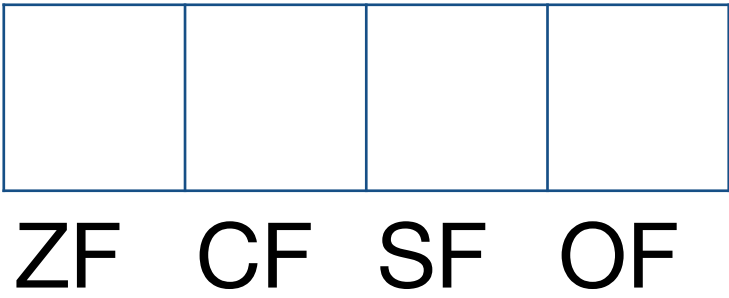
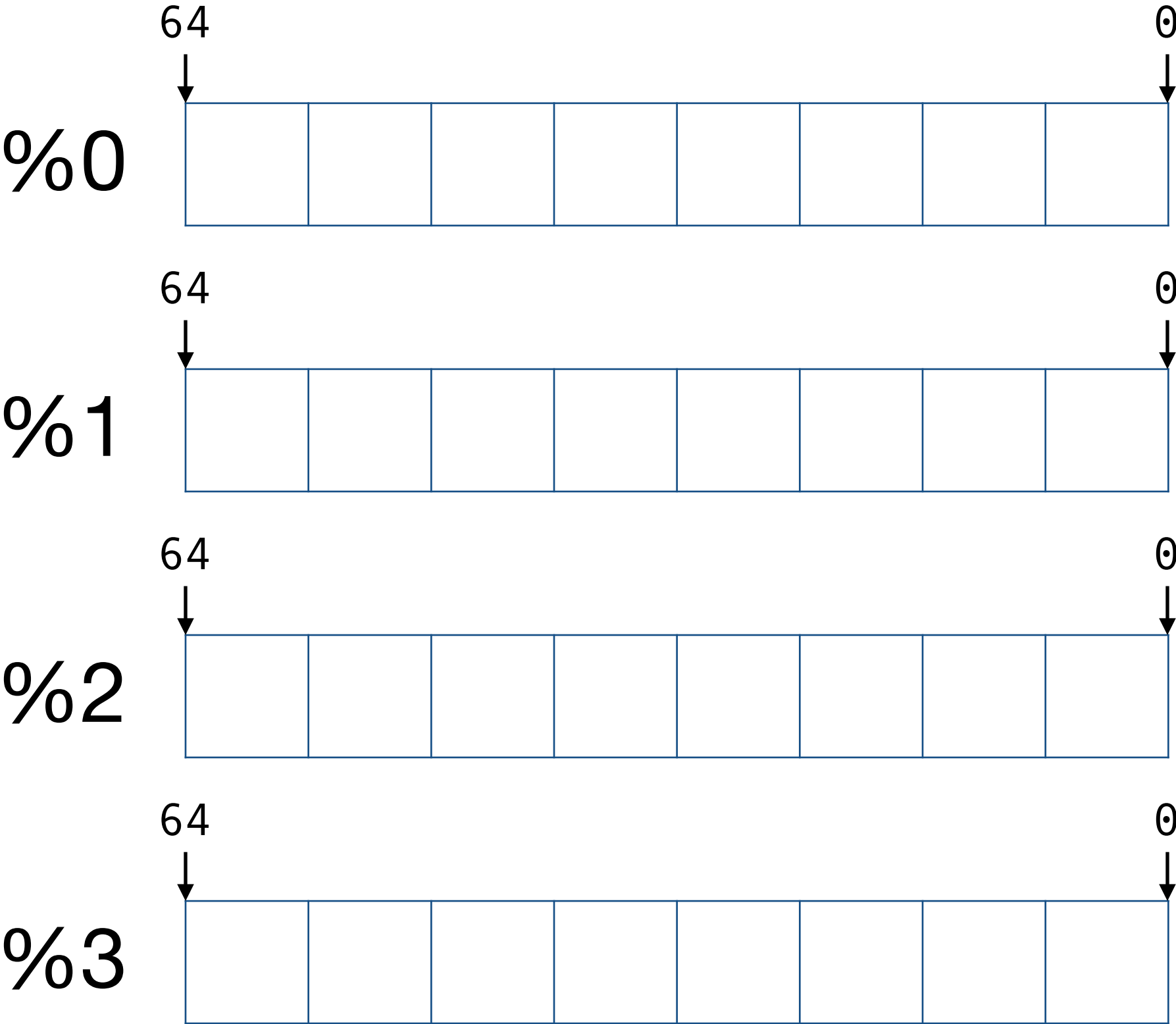
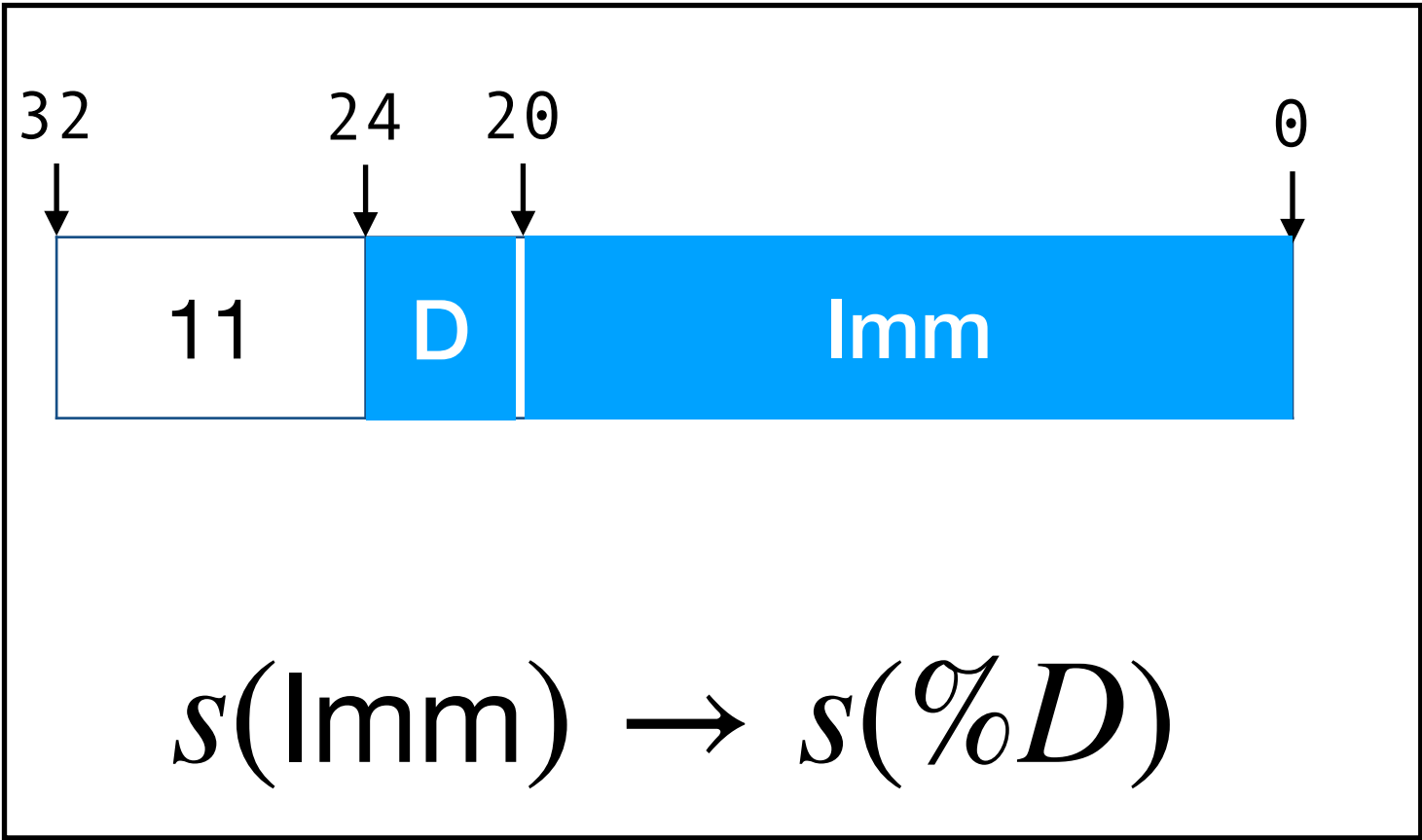
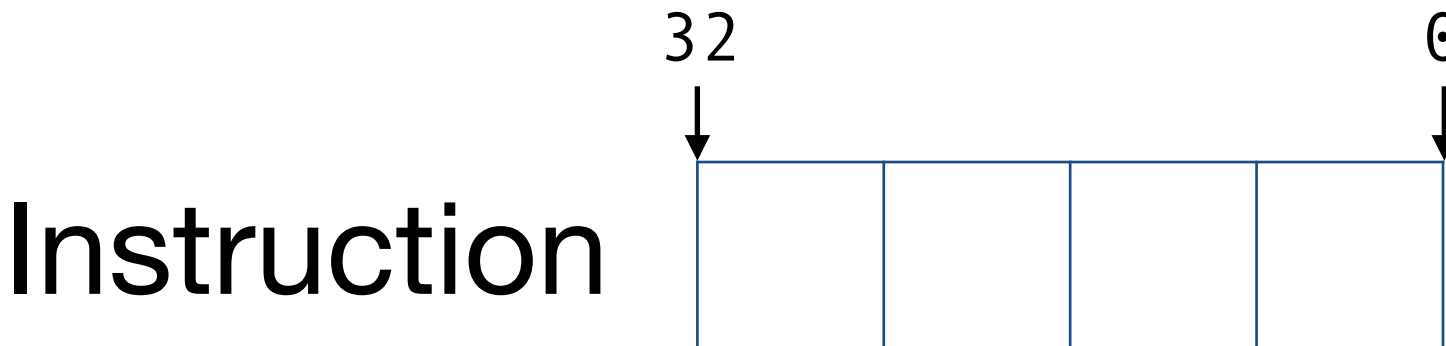
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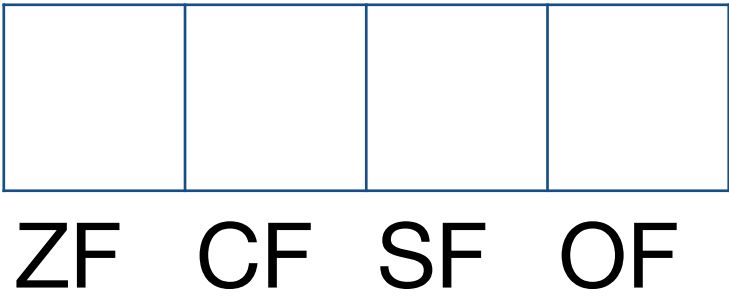
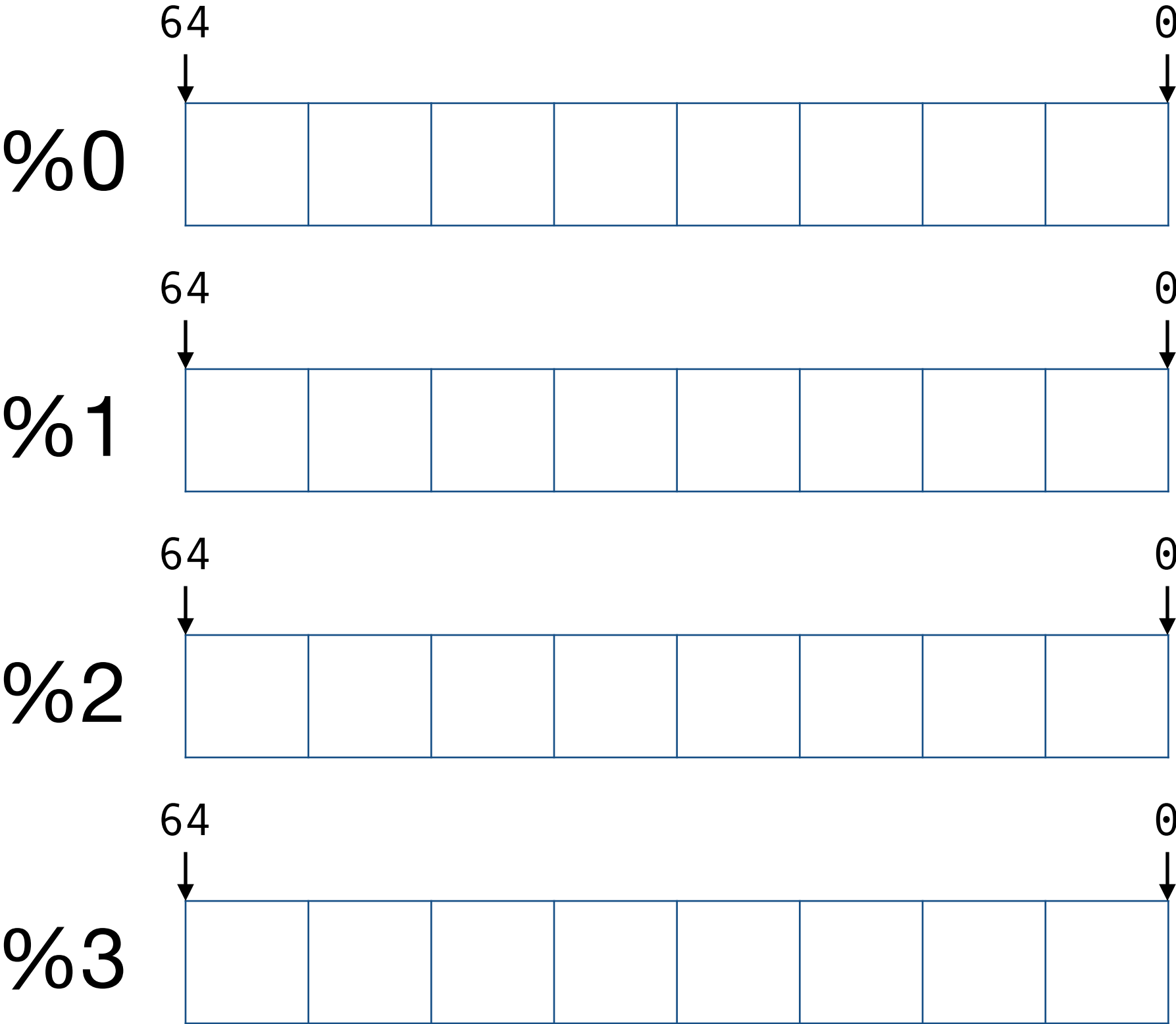
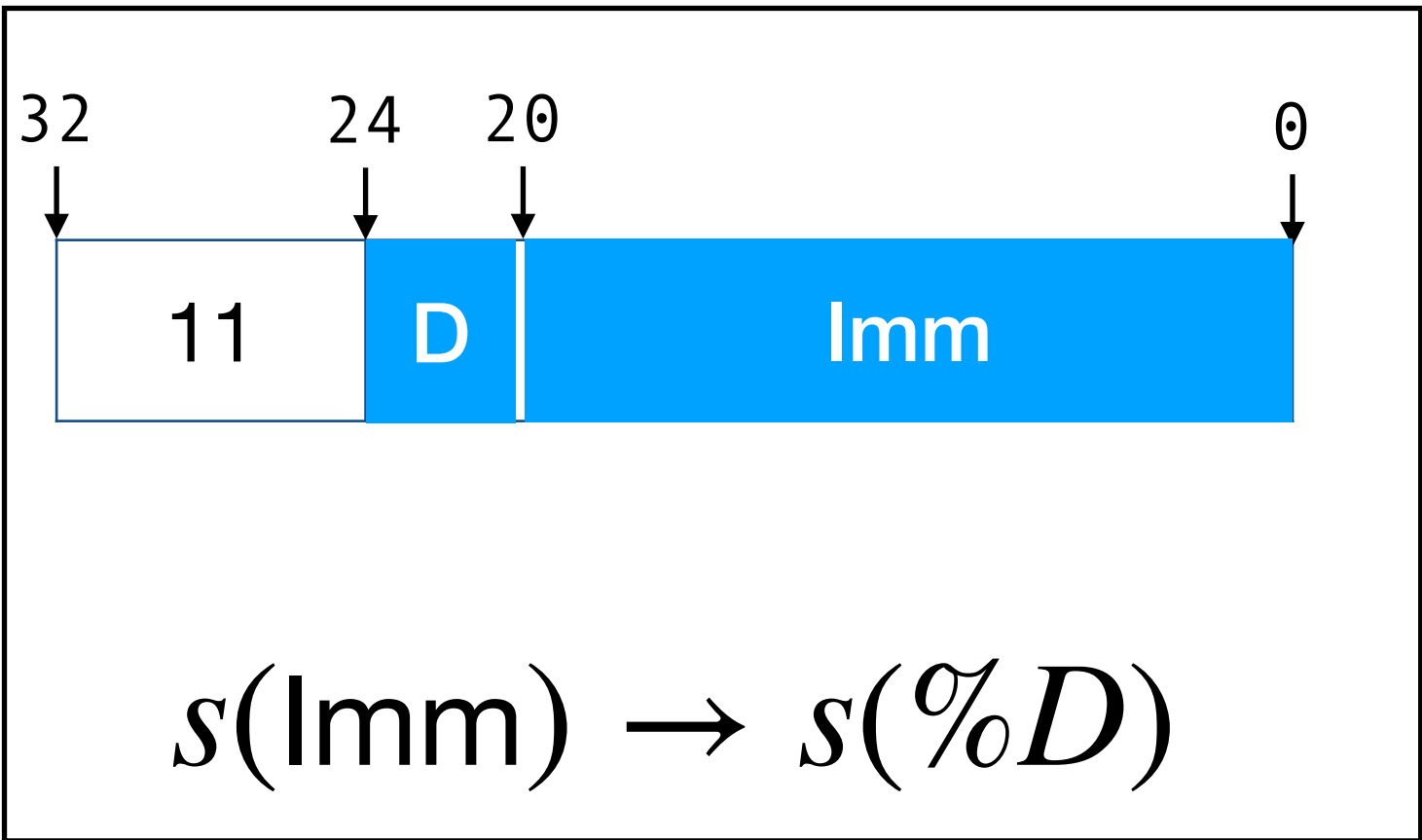
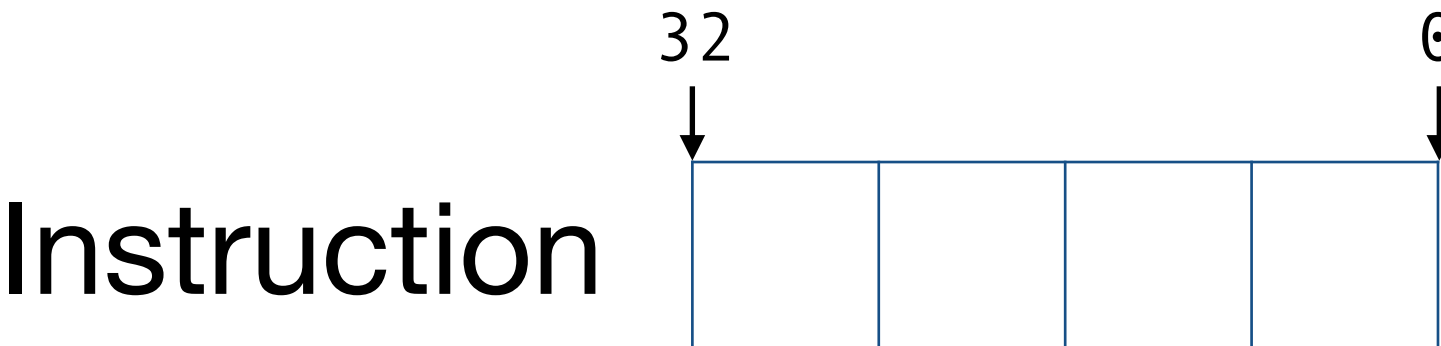
ULM: ALU and Register File



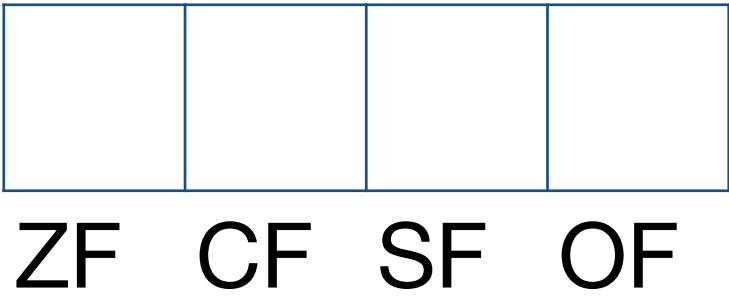
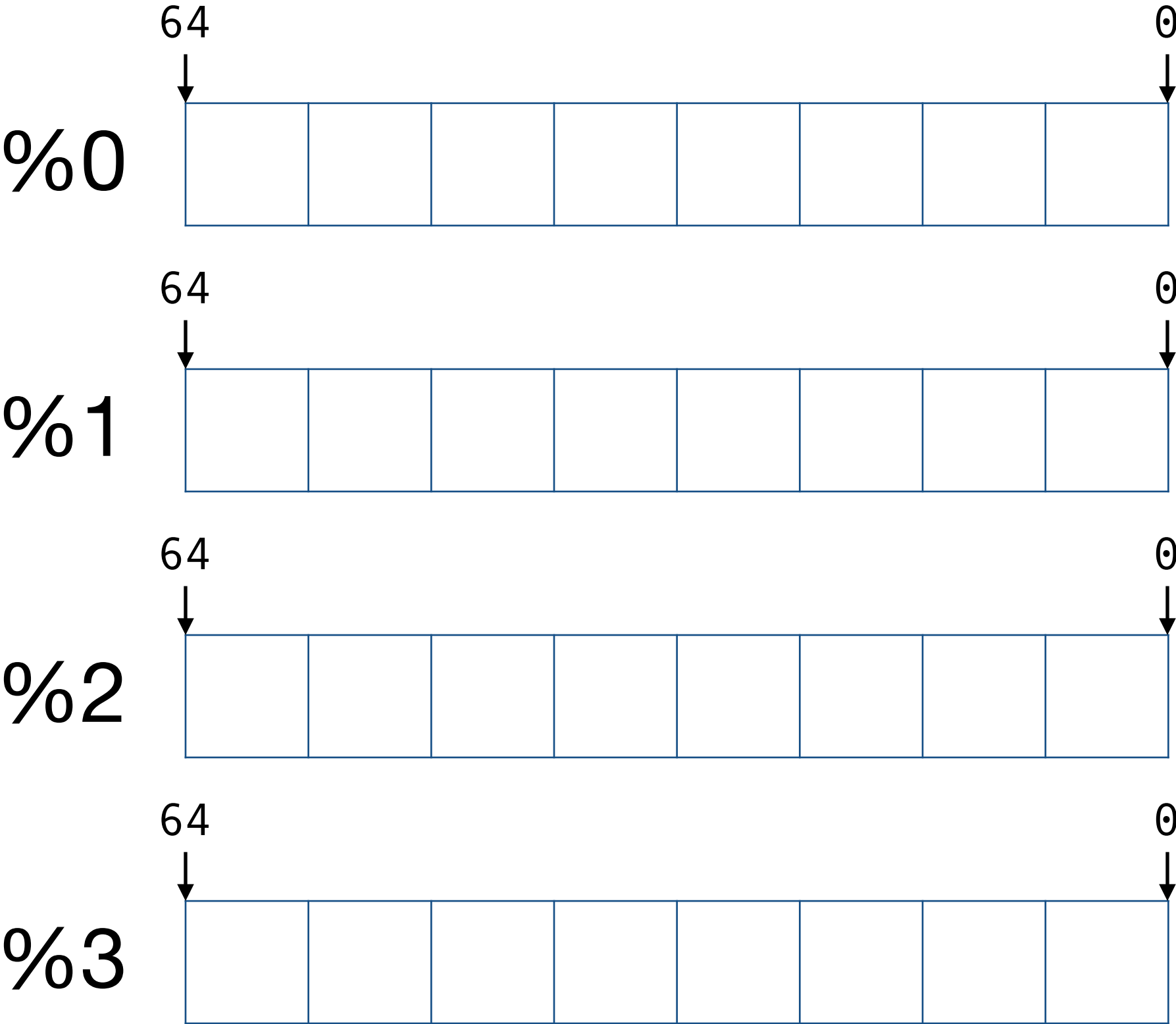
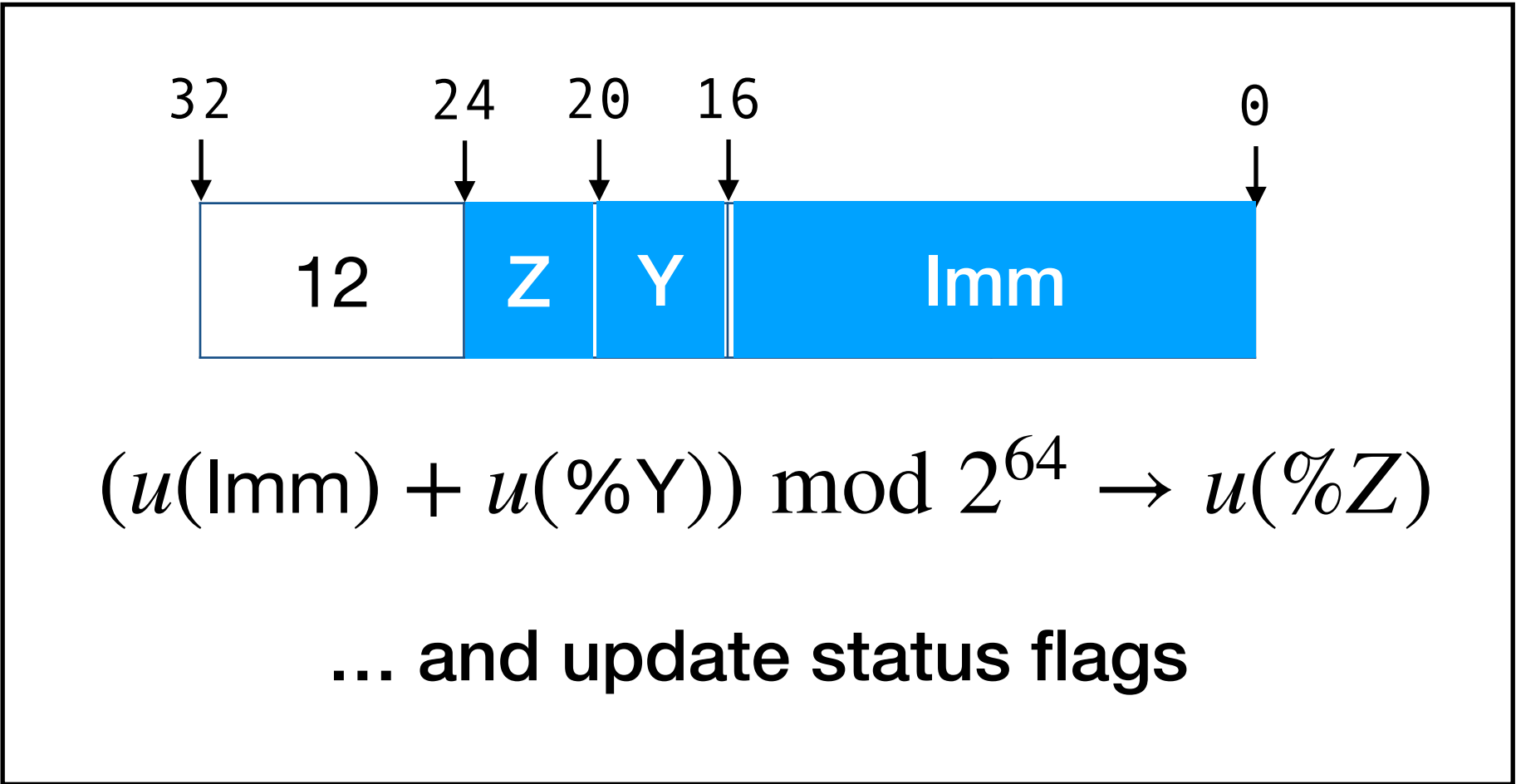
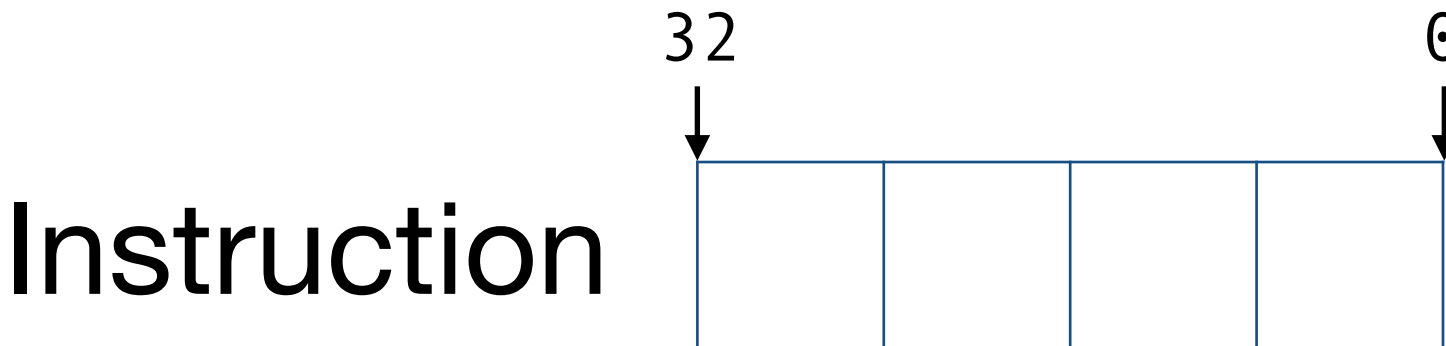
ULM: ALU and Register File



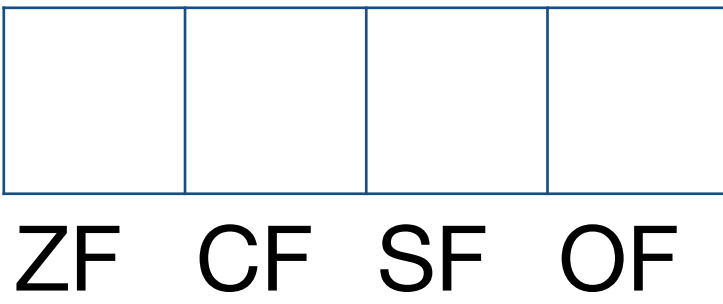
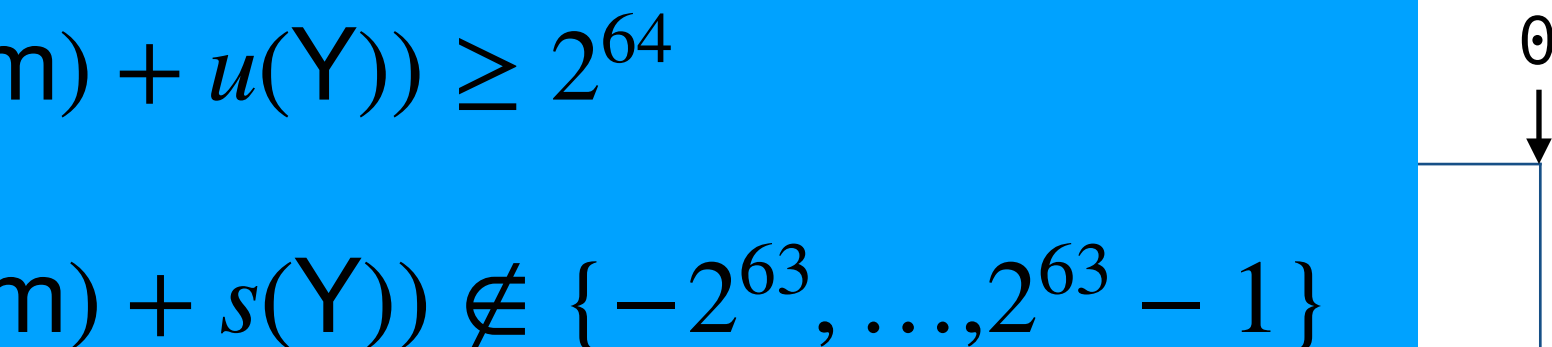
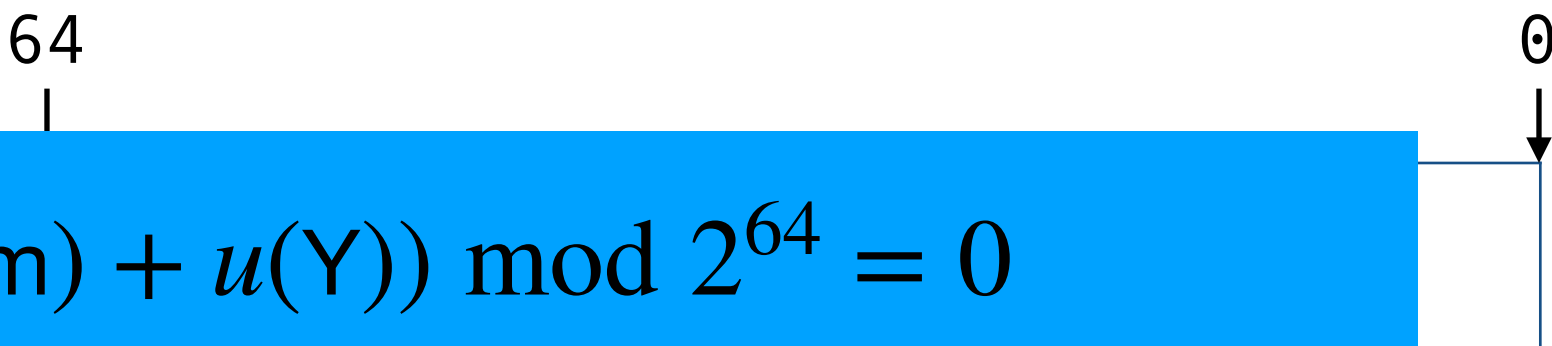
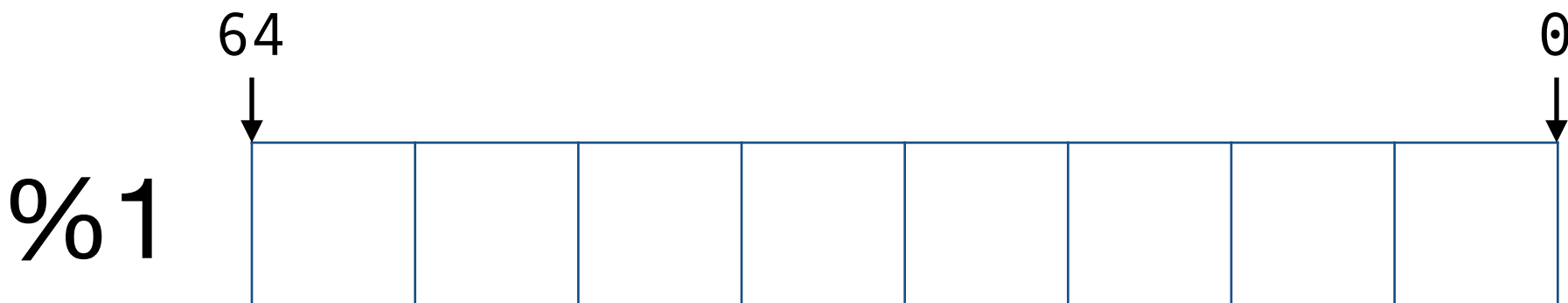
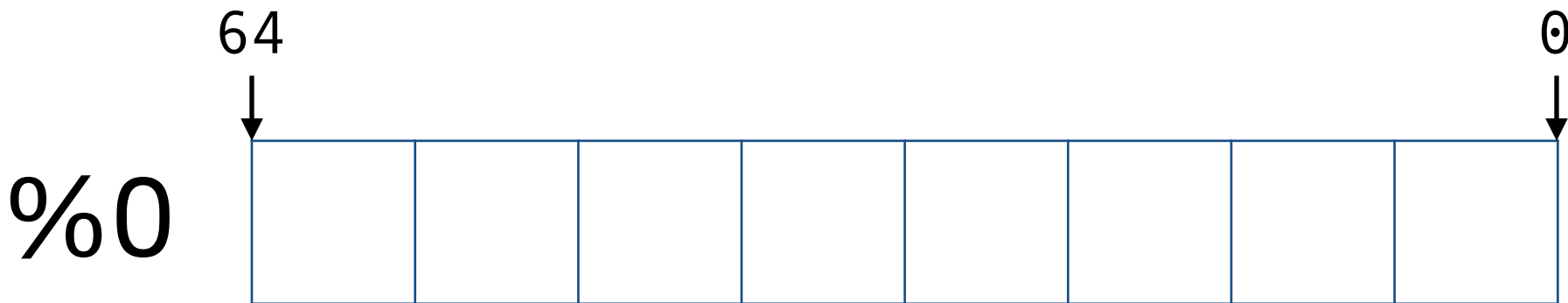
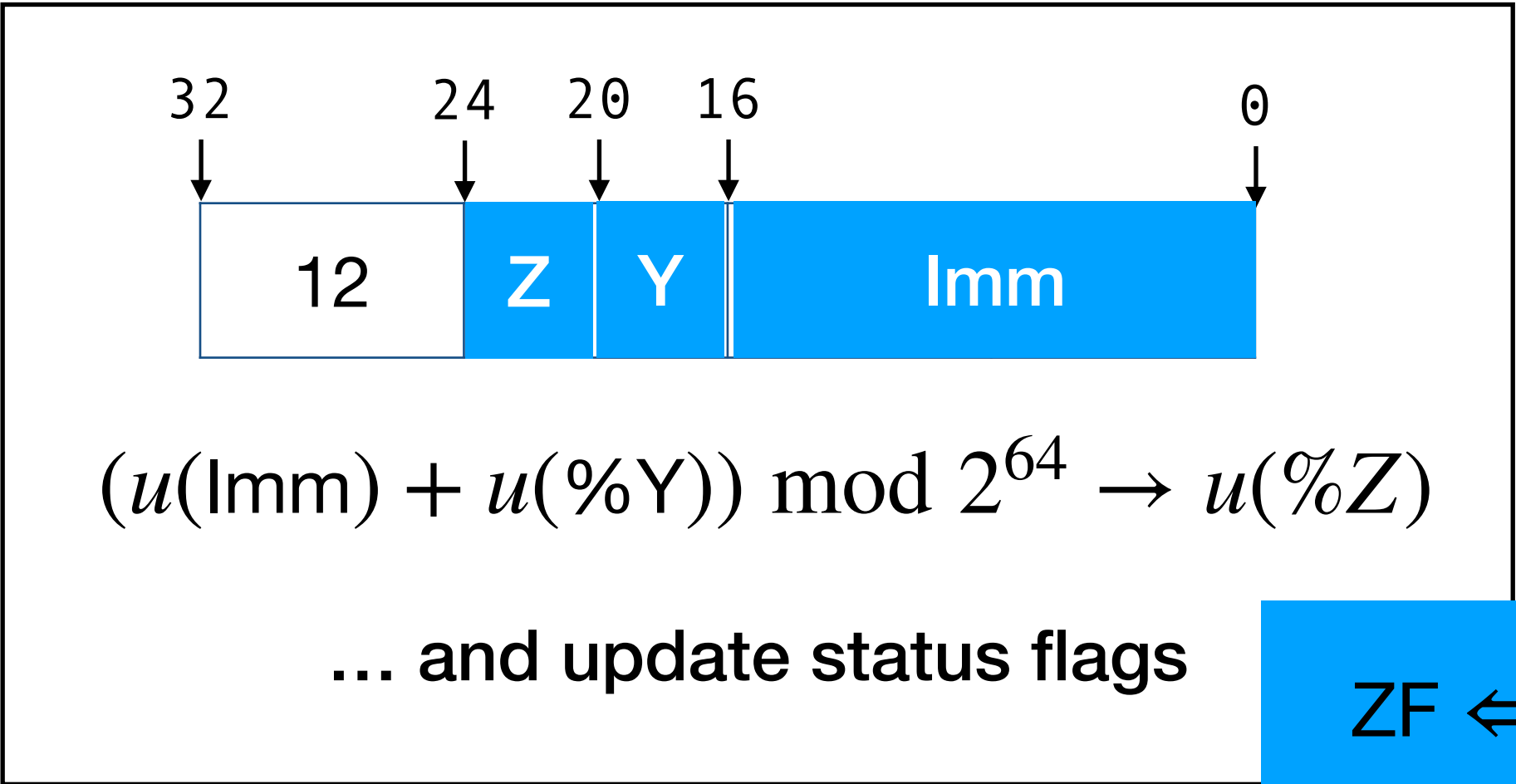
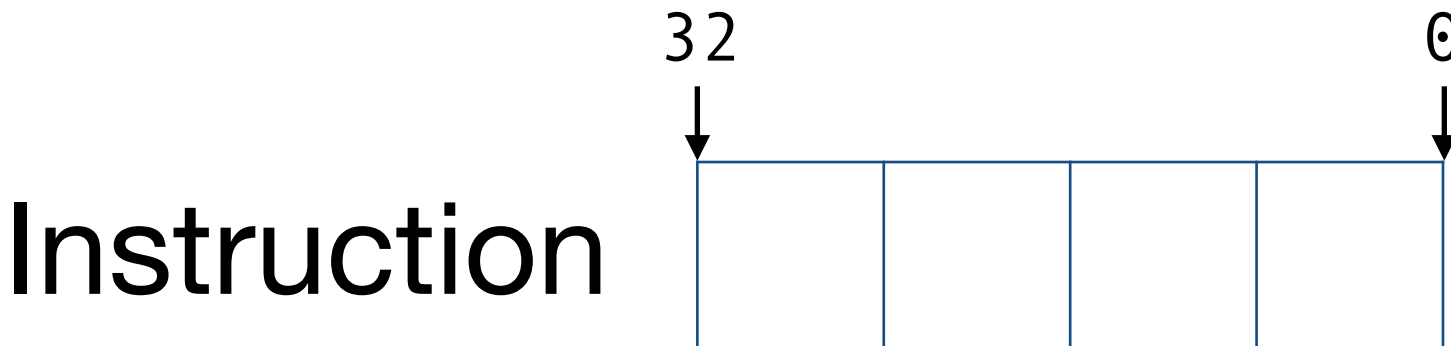
ULM: ALU and Register File



ULM: ALU and Register File



ULM: ALU and Register File

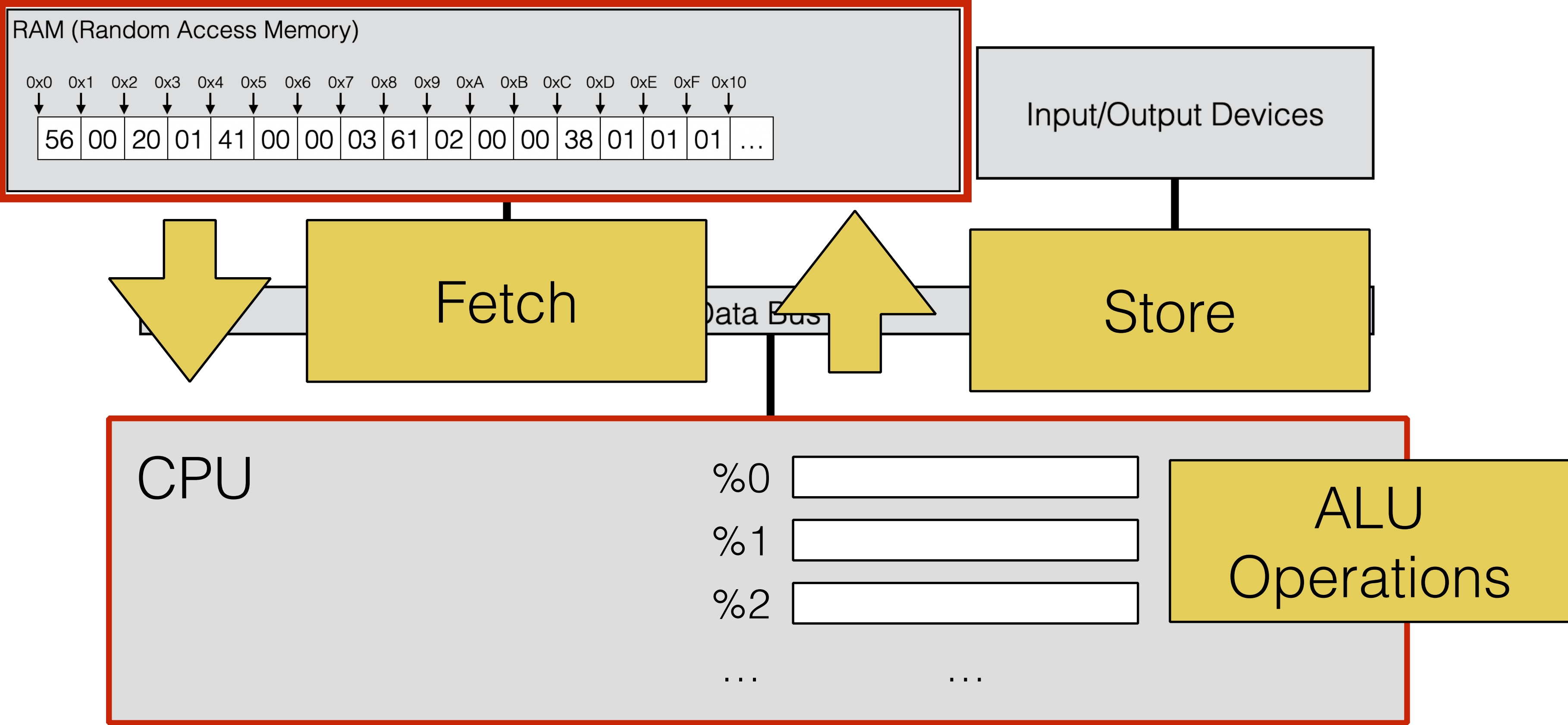


$ZF \Leftrightarrow (u(\text{Imm}) + u(Y)) \bmod 2^{64} = 0$

$CF \Leftrightarrow (u(\text{Imm}) + u(Y)) \geq 2^{64}$

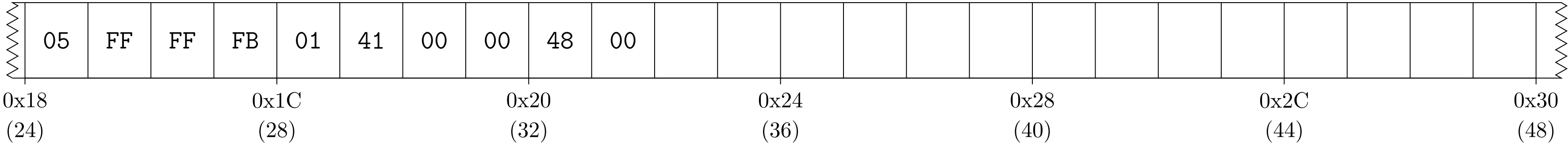
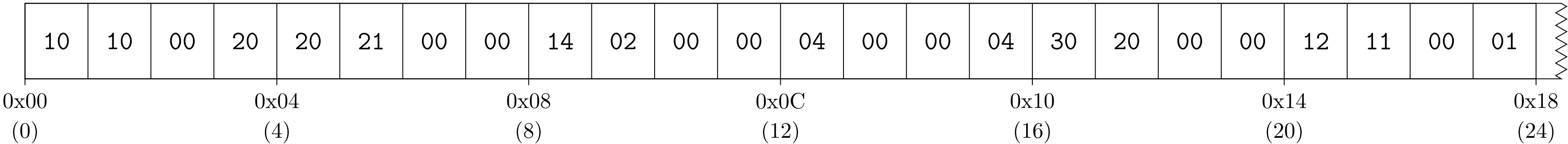
$OF \Leftrightarrow (s(\text{Imm}) + s(Y)) \notin \{-2^{63}, \dots, 2^{63} - 1\}$

$SF \Leftrightarrow s(\text{Imm}) + s(Y) < 0$



Instruction Cycle

0



%IP

00	00	00	00	00	00	00	00
----	----	----	----	----	----	----	----

%0x0

00	00	00	00	00	00	00	00
----	----	----	----	----	----	----	----

CF

--

%IR

--

%0x1

--

SF

--

%0x2

--

OF

--

Output device (append new characters):

--

%0x3

--

ZF

--

If ULM is halted: Display exit code:

--