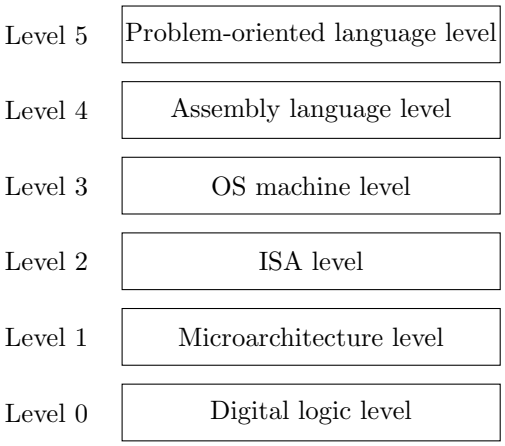
nasm parameter registers

Parameter	1	2	3	4	5	6	7+
Register	rdi	rsi	rdx	rcx	r8	r9	Stack

6-layer-computer-model



IEEE-754 exceptions

Characteristic	**Mantissa**	**Meaning**
0...0	Any	Subnormal
1...1	0...0	Overflow
1...1	$\neq 0...0$	NaN

Full adder

a_i	b_i	c_i	s_i	c_{i+1}
0	0	0	0	0
0	0	1	1	0
0	1	0	1	0
0	1	1	0	1
1	0	0	1	0
1	0	1	0	1
1	1	0	0	1
1	1	1	1	1

Carry-lookahead-adder

$g_i = a_i \wedge b_i$
$p_i = (a_i \oplus b_i)$
$c_{i+1} = g_i \vee p_i \wedge c_i$

IEEE-754 arithmatic

Addition:
- Adjust towards the bigger exponent
- Add mantissas
- Handle the signs

Multiplication:

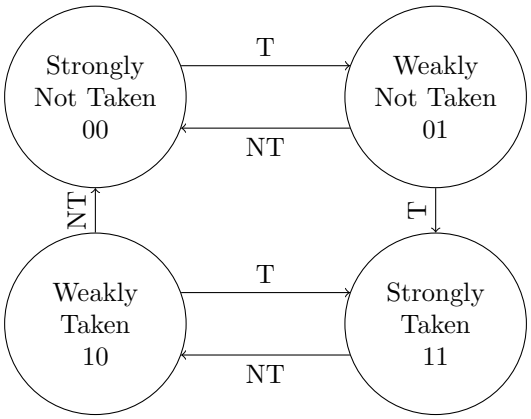
$$(-1)^{s_1 \oplus s_2} \cdot (m_1 \cdot m_2) \cdot b^{e_1+e_2}$$

Pipeline speed-up

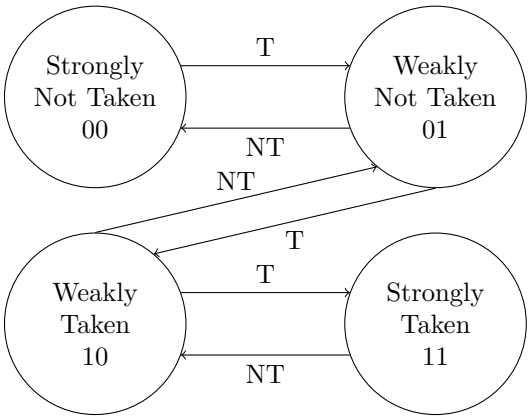
$$S = \frac{nk}{k+n-1}$$

Where:
n = no. of instructions
k = no. of pipeline stages

Hysteresis predictor



Saturation counter predictor



Very simple microprocessor