

FAST (Fast Assembly Super Turbo)

ISA

1. Name

FAST (stands for Fast Assembly Super Turbo) ISA

2. Instruction

Instruction	PC	Machine Code Format	Functionality
<code>init Rx, imm</code>	PC++	000 xx ii	Rx = imm imm: [-2, 1]
<code>ld Rx, (Ry)</code>	PC++	001 xx yy	Rx = Mem[Ry]
<code>st Rx, (Ry)</code>	PC++	010 xx yy	Mem[Ry] = Rx
<code>add Rx, Ry</code>	PC++	011 xx yy	Rx = Rx + Ry
<code>and Rx, Ry</code>	PC++	100 xx yy	Rx = Rx & Ry
<code>xor Rx, Ry</code>	PC++	101 xx yy	Rx = Rx xor Ry
<code>rsf Rz, imm</code>	PC++	111 z iii	z: {0, 1} imm: [0, 7]
<code>beqR imm</code>	if R0==R3: PC = PC + imm else: PC++	110 iiii	imm: [-8, 7]

3. Register

Register Name	Number
R0	00
R1	01
R2	10
R3	11

4. Memory

4.1 Data Memory

- 16-bit double-byte addressable
- 110 memory units in total
- using 7-bit address.

Address	Memory
000 0000	Mem[0]
000 0001	Mem[1]
...	...
110 1101	Mem[109]

4.2 Instruction Memory

- 8-bit byte addressable, PC is initialized at 0
- 64 memory units in total
- using 6-bit address.

Address	Memory
00 0000	Mem[0]
00 0001	Mem[1]
...	...
11 1111	Mem[63]