

| PC | Machine Code | Basic Code | Original Code | Result |
|------|--------------|-----------------|--------------------------|----------------------|
| 0x0 | 0x0200006F | jal x0 32 | jal x0,main | #pc= 0x00 |
| 0x4 | 0x0C40006F | jal x0 196 | jal x0,ill_init | #pc= 0x04 |
| 0x8 | 0x0D80006F | jal x0 216 | jal x0,eca_init | #pc= 0x08 |
| 0xc | 0x0C80006F | jal x0 200 | jal x0,int_init | #pc= 0x0c |
| 0x10 | 0x00000033 | add x0 x0 x0 | add x0,x0,x0 | #pc= 0x10 |
| 0x14 | 0x00000033 | add x0 x0 x0 | add x0,x0,x0 | #pc= 0x14 |
| 0x18 | 0x00000033 | add x0 x0 x0 | add x0,x0,x0 | #pc= 0x18 |
| 0x1c | 0x00000033 | add x0 x0 x0 | add x0,x0,x0 | #pc= 0x1c |
| 0x20 | 0x00007293 | andi x5 x0 0 | main:andi x5, x0, 0x0 | #x5= 0 |
| 0x24 | 0x00007313 | andi x6 x0 0 | andi x6, x0, 0x0 | #x6= 0 |
| 0x28 | 0x88888137 | lui x2 559240 | lui x2, 0x88888 | #x2= 0x888888000 |
| 0x2c | 0xFE62DAE3 | bge x5 x6 -12 | bge x5,x6 main | #illegal instruction |
| 0x30 | 0x00832183 | lw x3 8(x6) | lw x3, 0x8(x6) | #x3= 0x800000000 |
| 0x34 | 0x0032A223 | sw x3 4(x5) | sw x3, 0x4(x5) | #mem(1)= 0x800000000 |
| 0x38 | 0x00402083 | lw x1 4(x0) | lw x1, 0x4(x0) | #x1= 0x800000000 |
| 0x3c | 0x01C02383 | lw x7 28(x0) | nochange:lw x7, 0x1c(x0) | #x7= 0x800000000 |
| 0x40 | 0x00338863 | beq x7 x3 16 | beq x7, x3, cmd_add | |
| 0x44 | 0x555550B7 | lui x1 349525 | lui x1,0x55555 | #x1= 0x55555000 |
| 0x48 | 0x0070A0B3 | slt x1 x1 x7 | slt x1,x1,x7 | #x1= 0x1; |
| 0x4c | 0xFE0098E3 | bne x1 x0 -16 | bne x1,x0,nochange | |
| 0x50 | 0x007282B3 | add x5 x5 x7 | cmd_add:add x5, x5, x7 | #x5= 0x800000000 |
| 0x54 | 0x00230333 | add x6 x6 x2 | add x6, x6, x2 | #x6= 0x88888000 |
| 0x58 | 0x00531463 | bne x6 x5 8 | bne x6, x5, cmd_sub | |
| 0x5c | 0x40000033 | sub x0 x0 x0 | sub x0,x0,x0 | |
| 0x60 | 0x40530433 | sub x8 x6 x5 | cmd_sub: sub x8,x6,x5 | #x8= 0x08888000 |
| 0x64 | 0x405304B3 | sub x9 x6 x5 | sub x9,x6,x5 | #x9= 0x08888000 |
| 0x68 | 0x0080006F | jal x0 8 | jal x0, cmd_and | |
| 0x6c | 0x00007033 | and x0 x0 x0 | and x0,x0,x0 | |
| 0x70 | 0x0072F533 | and x10 x5 x7 | cmd_and: and x10,x5,x7 | #x10= 0x800000000 |
| 0x74 | 0x00000073 | ecall | ecall | #ecall |
| 0x78 | 0x00157593 | andi x11 x10 1 | andi x11,x10,0x1 | #x11= 0x0 |
| 0x7c | 0x00B51463 | bne x10 x11 8 | bne x10,x11 cmd_or | |
| 0x80 | 0x00006033 | or x0 x0 x0 | or x0,x0,x0 | |
| 0x84 | 0x00A5E5B3 | or x11 x11 x10 | cmd_or: or x11,x11,x10 | #x11= 0x800000000 |
| 0x88 | 0x0015E513 | ori x10 x11 1 | ori x10,x11,0x1 | #x10= 0x800000001 |
| 0x8c | 0x00558463 | beq x11 x5 8 | beq x11,x5,cmd_xor | |
| 0x90 | 0x00004033 | xor x0 x0 x0 | xor x0,x0,x0 | |
| 0x94 | 0x00A5C633 | xor x12 x11 x10 | cmd_xor: xor x12,x11,x10 | #x12= 0x000000001 |
| 0x98 | 0x00164613 | xori x12 x12 1 | xori x12,x12,0x1 | #x12= 0x000000000 |
| 0x9c | 0x00B61463 | bne x12 x11 8 | bne x12,x11,cmd_srl | |
| 0xa0 | 0x00000013 | addi x0 x0 0 | addi x0,x0,0x0 | |
| 0xa4 | 0x0012D293 | srl x5 x5 1 | cmd_srl: srl x5,x5,0x1 | #x5= 0x400000000 |
| 0xa8 | 0x00060463 | beq x12 x0 8 | beq x12,x0,cmd_sll | |

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|-------------|-------------------|-----------------|-----------------------------------|------------------|
| 0xac | 0x40000033 | sub x0 x0 x0 | sub x0,x0,x0 | |
| 0xb0 | 0x00129293 | slli x5 x5 1 | cmd_sll: slli x5,x5,0x1 | #x5= 0x80000000 |
| 0xb4 | 0x00B28463 | beq x5 x11 8 | beq x5,x11,cmd_slt | |
| 0xb8 | 0x00000013 | addi x0 x0 0 | addi x0,x0,0x0 | |
| 0xbc | 0x001026B3 | slt x13 x0 x1 | cmd_slt: slt x13,x0,x1 | #x13= 0x0 |
| 0xc0 | 0x00503733 | sltu x14 x0 x5 | sltu x14,x0,x5 | #x14= 0x1 |
| 0xc4 | 0xF5DFF06F | jal x0 -164 | jal x0,main | |
| 0xc8 | 0x00168693 | addi x13 x13 1 | ill_init: addi x13,x13,0x1 | #x13= 0x1 |
| 0xcc | 0x00168693 | addi x13 x13 1 | addi x13,x13,0x1 | #x13= 0x2 |
| 0xd0 | 0x30200073 | mret | mret | #mret |
| 0xd4 | 0x40C70733 | sub x14 x14 x12 | int_init: sub x14,x14,x12 | #x14= 0x1 |
| 0xd8 | 0x40C70733 | sub x14 x14 x12 | sub x14,x14,x12 | #x14= 0x0 |
| 0xdc | 0x30200073 | mret | mret | #mret |
| 0xe0 | 0x00128793 | addi x15 x5 1 | eca_init: addi x15,x5,0x1 | #x15= 0x80000001 |
| 0xe4 | 0x00178793 | addi x15 x15 1 | addi x15,x15,0x1 | #x15= 0x80000001 |
| 0xe8 | 0x30200073 | mret | mret | #mret |