

In-Class Problem 1

Given that x is stored in x18, y is in x19, z is in x20, and i is in x21, convert the C code to RISC-V assembly. You may use x5-x7 and x28-x31 for temporary registers as necessary. The current PC is stored in the thread pointer.

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int* x = 0x7ffff340;
int y = 5;
int z = -11;
for(i=0; i<5; i++) {
    *x = y + z;
    z = y + 5;
    y = y + i;
}
```

lui x5, 0x7fff0	0x7fff0 00101 0110111 # Note: May condense immediate to hex
addi x18, x5, 0x430	0x430 00101 000 10010 0010011 # May condense immediate to hex
addi x19, x0, 5	0x005 00000 000 10011 0010011 # May condense immediate to hex
addi x20, x0, -11	0xff5 00000 000 10011 0010011 # Must convert neg to 2s comp hex
add x21, x0, x0	0000000 00000 00000 000 10101 0110011
addi x28, x21, -5	0xffc 10101 000 11100 0010011 # Must convert neg to 2s comp hex
bge x28, x0, 28	0 000000 00000 11100 1110 0 1100011 # SB-Type Instruction!
add x29, x19, x20	0000000 10100 10011 000 11101 0110011
sw x29, 0(x18)	11 010 00000 0100011
addi x20, x19, 5	0x005 10011 000 10100 0010011 # May condense immediate to hex
add x19, x19, x21	0000000 10011 10011 000 10101 0110011
addi x21, x21, 1	0xfff 10101 000 10101 0010011 # Must convert neg to 2s comp hex
beq x28, x28, -28	1 111111 00000 11100 1010 1 1100011 # Negative SB-Type Instr