

CS 315-02 Project01 RISC-V Assembly

Extra OH today 4:30pm to 5:30pm
in office and zoom

Lab01 good results

Project01 Sign up Sheet

20 mins

```
./start.sh
```

```
ssh um
```

```
ssh -T git@github.com
```

} both vms

add new alias 'm' micro 'u' vim

```
git clone project01
```

```
make
```

```
autograder
```

Signed vs unsigned

int 32 bits

32 bits
0x F2F21234
↑
4 bits

unsigned 2^{32}

$$-1 \times 8 = 32$$

$$0 - (2^{32} - 1)$$

$$\frac{2^{32}}{2} = 2^{32-1} = 2^{31}$$

int

-2^{31} to $(2^{31} - 1)$

First arg base

"0b" \Rightarrow base = 2

"0x" \Rightarrow base = 16

otherwise \Rightarrow base = 10

```
printf("Bad input");
```

```
exit(-1);
```

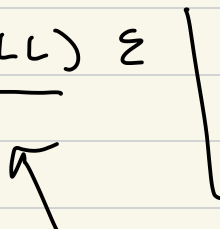
```
#include <stdlib.h>
```

Output look right but fails test
=> improper null termination

Assignment vs comparison

if (p = NULL) {
}
gcc -Wall

if (p == NULL) {
}



if (NULL == p) {
}
if (NULL = p) {
}

Lab 02

- RISC-V
- Problems

uint32_t

uint32_t x = -1;
if (x > 0)

RISC-V Assembly

Vocabulary

instructions



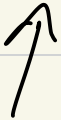
Mnemonics

add, li, ret

registers

32

x0 - x31



ABI

a0, a1

t0, t1

variables

of the processor

Immediates

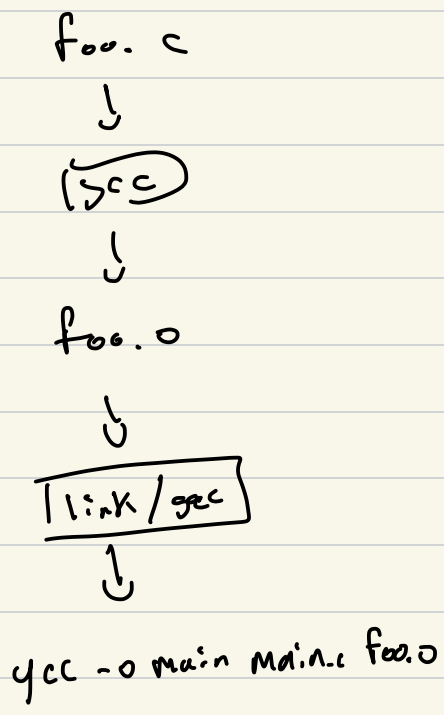
li: s0, 44

Labels

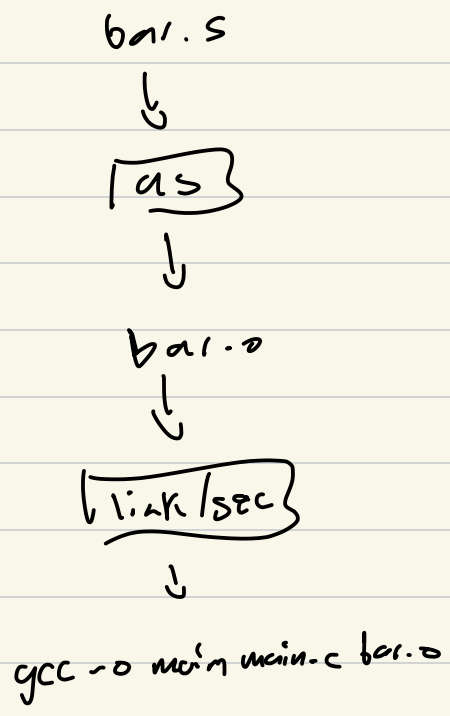
foo:

add t0, t1, t2

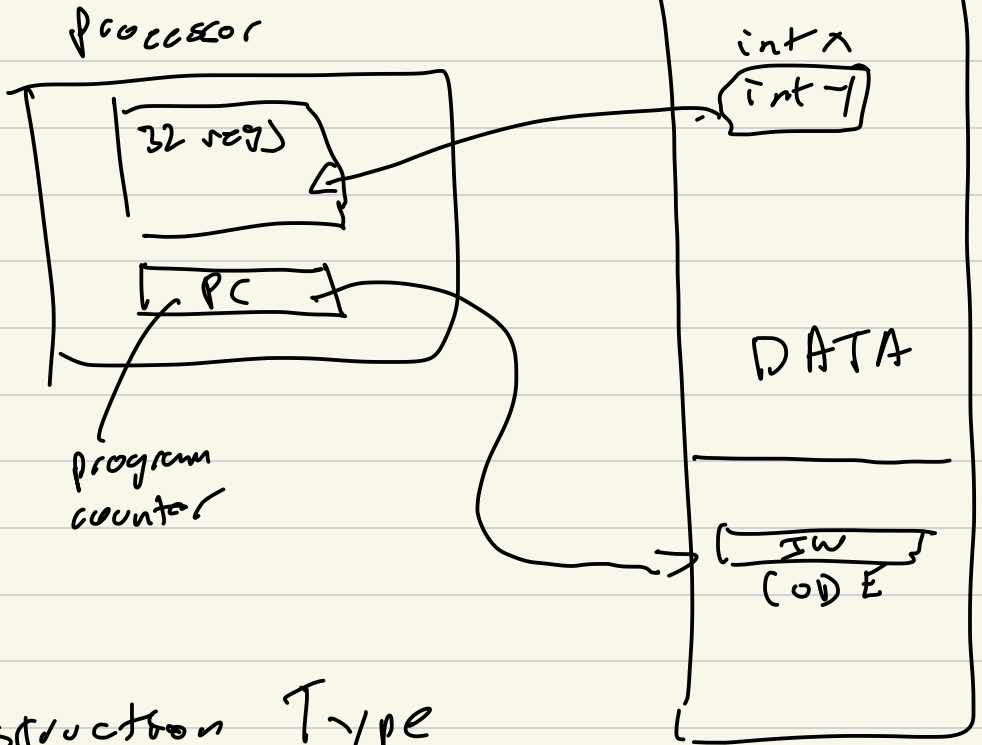
Compiling



Assembling



Programming Model



Instruction Type

- 1) Data processing
- 2) Control
- 3) Memory