

- Jump instructions

- if

- for

- while

- Setting condition codes

cf zf sf of

~~cmpl~~ testl

-> setne op
 ~~z~~
 ~~l~~

jump instruction

jmp dest → address

jmp 0x08000000

~~%eax~~^{ip} → program counter

instruction pointer

dest → address

↳ usually a label

jmp done

jmp .L7

dest → indirect

↳ not going into detail

$\left\{ \begin{array}{l} \text{jmp } * \% \text{eax} \xrightarrow{\text{any mem.}} \text{top.} \\ \text{jmp } * (\% \text{eax}) \xrightarrow{\text{space}} \text{L7} \end{array} \right.$

$\% \text{eax} \rightarrow 20$

$\% \text{ebx} \rightarrow 10$

top:

decl $\% \text{eax}$

cmpl $\% \text{ebx}$, $\% \text{eax}$

jge top

subt. 1 from $\% \text{eax}$

~~$(\% \text{ebx} - \% \text{eax})$~~

↳ setting flags

if greater than

or zero

jump to top

decr. $\% \text{eax}$ until less than $\% \text{ebx}$

je, jne, jl

cmpl ~~src2, src1~~
src1 - src2

translating C code

if / else

if (test-expr) {
 then-statement

} else {
 else-statement
}

C / english

t = test-expr → cmpl

if (!t) goto false → j--- false

then-statement \rightarrow statement
goto done \rightarrow jmp done

false:

else-statement, $\overline{a-b} > 0$ \rightarrow $\%eax \rightarrow a$ (a-b)

done:

$\overline{a-b} > 0$ \rightarrow $\%ebx \rightarrow b$ \rightarrow

if (a < b)
a = 500

cmpl $\%ebx$, $\%eax$
jnl false

else
b = 500

movl \$500, $\%eax$
jmp done

false:

movl \$500, $\%ebx$

done:

do-while

do {

body-statement
body-expr

} while (test-expr);

loop:

body-statement
~~body-expr~~

t = test-expr

if (t) goto loop

while :

```
while (test-expr) {
```

```
    body-statement
```

```
}
```

```
t = test-expr
```

```
if (!t) goto done
```

```
loop:
```

```
    body-statement
```

```
    t = test-expr
```

```
    if (t) goto loop
```

```
done:
```

if (!test-expr)
skip

for loop:

```
for (init-expr; test-expr; update-expr)
```

```
    body-statement
```

```
init-expr
```

```
t = test-expr
```

```
if (!t) goto done
```


loop:

body - statement

t = test - expr

if (t) goto loop

Update - expr

