

# Princeton University

## COS 217: Introduction to Programming Systems

### Machine Language for the "detecta" Program

#### Machine Language from Assembler

```
$ gcc -c detecta.s
```

```
$ gdb detecta.o
```

```
(gdb) x/12i main
0x0 <main>:    push    %ebp
0x1 <main+1>:   mov     %esp,%ebp
0x3 <main+3>:   call   0x4 <main+4>
0x8 <main+8>:   cmp    $0x41,%eax
0xb <main+11>:  jne    0x1a <skip>
0xd <main+13>:  push  $0x0
0x12 <main+18>: call   0x13 <main+19>
0x17 <main+23>: add    $0x4,%esp
0x1a <skip>:    mov    $0x0,%eax
0x1f <skip+5>:  mov    %ebp,%esp
0x21 <skip+7>:  pop    %ebp
0x22 <skip+8>:  ret
```

```
(gdb) x/35b main
0x0 <main>:    0x55    0x89    0xe5    0xe8    0xfc    0xff    0xff    0xff
0x8 <main+8>:   0x83    0xf8    0x41    0x75    0x0d    0x68    0x00    0x00
0x10 <main+16>: 0x00    0x00    0xe8    0xfc    0xff    0xff    0xff    0x83
0x18 <main+24>: 0xc4    0x04    0xb8    0x00    0x00    0x00    0x00    0x89
0x20 <skip+6>: 0xec    0x5d    0xc3
```

```
(gdb) quit
```

#### Machine Language from Linker

```
$ gcc -o detecta detecta.o
```

```
$ gdb detecta
```

```
(gdb) x/12i main
0x8048378 <main>:    push    %ebp
0x8048379 <main+1>:   mov     %esp,%ebp
0x804837b <main+3>:   call   0x804829c <getchar>
0x8048380 <main+8>:   cmp    $0x41,%eax
0x8048383 <main+11>:  jne    0x8048392 <skip>
0x8048385 <main+13>:  push  $0x8048470
0x804838a <main+18>:  call   0x80482bc <printf>
0x804838f <main+23>:  add    $0x4,%esp
0x8048392 <skip>:    mov    $0x0,%eax
0x8048397 <skip+5>:    mov    %ebp,%esp
0x8048399 <skip+7>:    pop    %ebp
0x804839a <skip+8>:    ret
```

```
(gdb) x/35b main
0x8048378 <main>:    0x55    0x89    0xe5    0xe8    0x1c    0xff    0xff    0xff
0x8048380 <main+8>:   0x83    0xf8    0x41    0x75    0x0d    0x68    0x70    0x84
0x8048388 <main+16>: 0x04    0x08    0xe8    0x2d    0xff    0xff    0xff    0x83
0x8048390 <main+24>: 0xc4    0x04    0xb8    0x00    0x00    0x00    0x00    0x89
0x8048398 <skip+6>: 0xec    0x5d    0xc3
```

```
(gdb) quit
```