

# 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
```