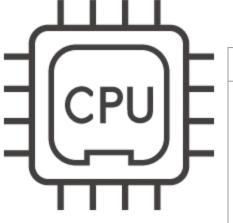
Building a Web Server

Introduction

Connor Nelson Arizona State University

```
mov rax, 0x1337
mov rbx, 0x555555554000
mov qword ptr [rbx], rax
add rax, 0x42
push rax
```



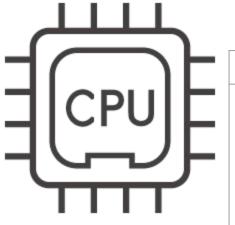
REGISTERS

RAX	0×0000000000000000
RBX	0×0000000000000000
RCX	0×0000000000000000
RDX	0×0000000000000000
RDI	0×00000000000000000
RSI	0×00000000000000000
RSP	0x00007fffffffe010
RBP	0×00000000000000000
RIP	0x0000555555555000

MEMORY 555555554000 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 555555554008 55555554010 00 00 00 00 00 00 00 00 H..7...H 55555555000 48 c7 c0 37 13 00 00 48 | bb 00 40 55 55 55 55 00 | ..@UUUU. 55555555008 .H..H..B 55555555010 00 48 89 03 48 83 c0 42 | 55555555018 50 00 00 00 00 00 00 00 | P...... 7fffffffe000 00 00 00 00 00 00 00 7fffffffe008 00 00 00 00 00 00 00 00 7fffffffe010 00 00 00 00 00 00 00 00

mov rax, 0x1337

mov rbx, 0x55555554000 mov qword ptr [rbx], rax add rax, 0x42 push rax



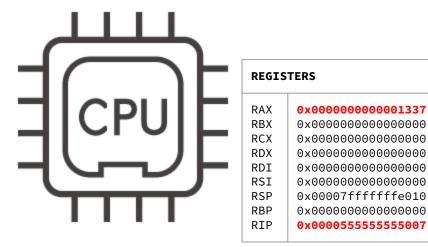
REGISTERS

RAX 0x00000000000000000 RBX 0x00000000000000000 **RCX** 0x00000000000000000 RDX 0x00000000000000000 RDI 0x0000000000000000 RSI 0x00000000000000000 **RSP** 0x00007fffffffe010 **RBP** 0x00000000000000000 RIP 0x000055555555000

MEMORY 555555554000 00 00 00 00 00 00 00 00 555555554008 00 00 00 00 00 00 00 00 555555554010 00 00 00 00 00 00 00 00 55555555000 48 c7 c0 37 13 00 00 48 | H . . 7 . . . H bb 00 40 55 55 55 50 00 l 55555555008 ..auuuu. .H..H..B 55555555010 00 48 89 03 48 83 c0 42 55555555018 50 00 00 00 00 00 00 00 P..... 7fffffffe000 00 00 00 00 00 00 00 00 7fffffffe008 00 00 00 00 00 00 00 00 7fffffffe010 00 00 00 00 00 00 00 00

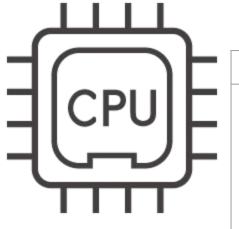
mov rax, 0x1337

mov rbx, 0x55555554000 mov qword ptr [rbx], rax add rax, 0x42 push rax



MEMORY 555555554000 00 00 00 00 00 00 00 00 555555554008 00 00 00 00 00 00 00 00 555555554010 00 00 00 00 00 00 00 00 55555555000 48 c7 c0 37 13 00 00 48 | H . . 7 . . . H bb 00 40 55 55 55 50 00 l 55555555008 ..auuuu. .H..H..B 55555555010 00 48 89 03 48 83 c0 42 55555555018 50 00 00 00 00 00 00 00 P..... 7fffffffe000 00 00 00 00 00 00 00 00 7fffffffe008 00 00 00 00 00 00 00 00 7fffffffe010 00 00 00 00 00 00 00 00

```
mov rax, 0x1337
mov rbx, 0x55555554000
mov qword ptr [rbx], rax
add rax, 0x42
push rax
```

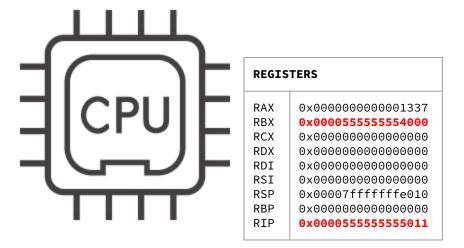


REGISTERS

RAX	0x000000000001337
RBX	0x0000000000000000
RCX	0×0000000000000000
RDX	0x0000000000000000
RDI	0x0000000000000000
RSI	0×0000000000000000
RSP	0x00007fffffffe010
RBP	0×0000000000000000
RIP	0x0000555555555007

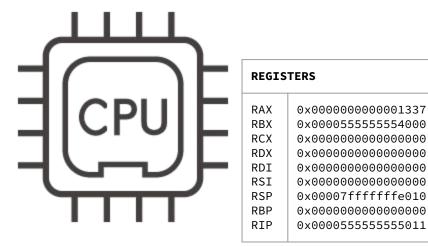
```
MEMORY
555555554000
               00 00 00 00 00 00 00 00
               00 00 00 00 00 00 00 00
555555554008
55555554010
               00 00 00 00 00 00 00 00
55555555000
               48 c7 c0 37 13 00 00 48
                                         H..7...H
               bb 00 40 55 55 55 55 00 | ..@UUUU.
55555555008
                                         .H..H..B
55555555010
               00 48 89 03 48 83 c0 42 |
55555555018
                50 00 00 00 00 00 00 00 | P......
7fffffffe000
               00 00 00 00 00 00 00 00
7fffffffe008
               00 00 00 00 00 00 00 00
7fffffffe010
               00 00 00 00 00 00 00 00
```

```
mov rax, 0x1337
mov rbx, 0x55555554000
mov qword ptr [rbx], rax
add rax, 0x42
push rax
```



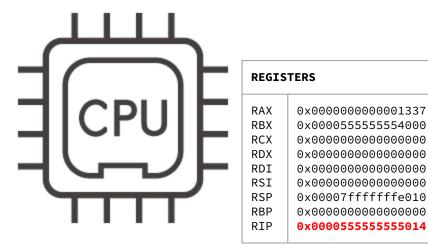
```
MEMORY
555555554000
                00 00 00 00 00 00 00 00
555555554008
                00 00 00 00 00 00 00 00
555555554010
                00 00 00 00 00 00 00 00
55555555000
                48 c7 c0 37 13 00 00 48
                                          H..7...
                bb 00 40 55 55 55 55 00 |
55555555008
                                          .. @UUUU.
                                         .H..H..B
55555555010
                00 48 89 03 48 83 c0 42
55555555018
                50 00 00 00 00 00 00 00
                                         P.....
7fffffffe000
                00 00 00 00 00 00 00 00
7fffffffe008
                00 00 00 00 00 00 00 00
7fffffffe010
                00 00 00 00 00 00 00 00
```

```
mov rax, 0x1337
mov rbx, 0x555555554000
mov qword ptr [rbx], rax
add rax, 0x42
push rax
```



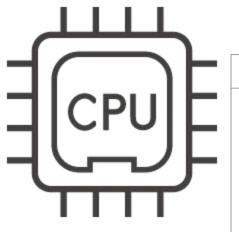
```
MEMORY
555555554000
               00 00 00 00 00 00 00 00
555555554008
               00 00 00 00 00 00 00 00
555555554010
                00 00 00 00 00 00 00 00
55555555000
               48 c7 c0 37 13 00 00 48 |
                                         H..7...H
55555555008
                bb 00 40 55 55 55 50 l
                                         ..auuuu.
                                         .H..H..B
55555555010
               00 48 89 03 48 83 c0 42
55555555018
                50 00 00 00 00 00 00 00
                                         P.....
7fffffffe000
                00 00 00 00 00 00 00 00
7fffffffe008
               00 00 00 00 00 00 00 00
7fffffffe010
                00 00 00 00 00 00 00 00
```

```
mov rax, 0x1337
mov rbx, 0x555555554000
mov qword ptr [rbx], rax
add rax, 0x42
push rax
```



```
MEMORY
555555554000
                37 13 00 00 00 00 00 00
                                          7.....
555555554008
                00 00 00 00 00 00 00 00
555555554010
                00 00 00 00 00 00 00 00
55555555000
                48 c7 c0 37 13 00 00 48 |
                                          H..7...H
                bb 00 40 55 55 55 55 00 l
55555555008
                                          ..auuuu.
                                          .H..H..B
55555555010
                00 48 89 03 48 83 c0 42
55555555018
                50 00 00 00 00 00 00 00
                                         P.....
7fffffffe000
                00 00 00 00 00 00 00 00
7fffffffe008
                00 00 00 00 00 00 00 00
7fffffffe010
                00 00 00 00 00 00 00 00
```

```
mov rax, 0x1337
mov rbx, 0x555555554000
mov qword ptr [rbx], rax
add rax, 0x42
push rax
```

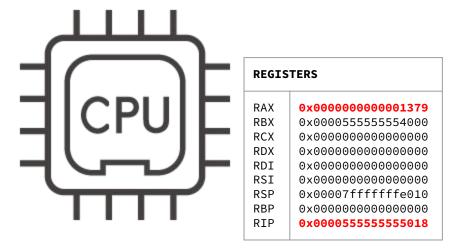


REGISTERS

RAX	0x0000000000001337
RBX	0x0000555555554000
RCX	0×00000000000000000
RDX	0×0000000000000000
RDI	0×0000000000000000
RSI	0×0000000000000000
RSP	0x00007fffffffe010
RBP	0×0000000000000000
RIP	0x0000555555555014

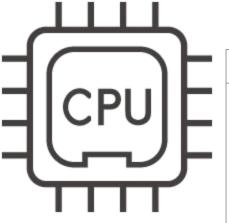
```
MEMORY
555555554000
               37 13 00 00 00 00 00 00
                                         7.....
               00 00 00 00 00 00 00 00
555555554008
55555554010
               00 00 00 00 00 00 00 00
                                         H..7...H
55555555000
               48 c7 c0 37 13 00 00 48 |
55555555008
               bb 00 40 55 55 55 55 00 | ..@UUUU.
                                        .H..H..B
55555555010
               00 48 89 03 48 83 c0 42
               50 00 00 00 00 00 00 00
55555555018
                                        P.....
7fffffffe000
               00 00 00 00 00 00 00 00
7fffffffe008
               00 00 00 00 00 00 00 00
7fffffffe010
               00 00 00 00 00 00 00 00
```

```
mov rax, 0x1337
mov rbx, 0x555555554000
mov qword ptr [rbx], rax
add rax, 0x42
push rax
```



```
MEMORY
555555554000
               37 13 00 00 00 00 00 00
                                         7.....
555555554008
               00 00 00 00 00 00 00 00
555555554010
               00 00 00 00 00 00 00 00
55555555000
               48 c7 c0 37 13 00 00 48 |
                                         H..7...H
55555555008
               bb 00 40 55 55 55 50 l
                                         ..auuuu.
                                         .H..H..B
55555555010
               00 48 89 03 48 83 c0 42
                50 00 00 00 00 00 00 00
55555555018
                                         P.....
7fffffffe000
               00 00 00 00 00 00 00 00
7fffffffe008
               00 00 00 00 00 00 00 00
7fffffffe010
               00 00 00 00 00 00 00 00
```

```
mov rax, 0x1337
mov rbx, 0x555555554000
mov qword ptr [rbx], rax
add rax, 0x42
push rax
```



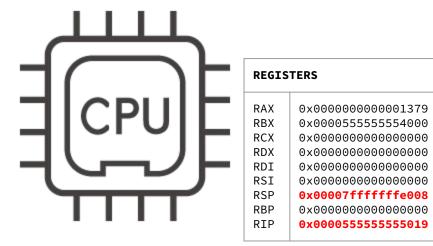
REGISTERS RAX 0x000000000001379 RBX 0x0000555555554000 **RCX** 0x00000000000000000 RDX 0x00000000000000000 RDI 0x0000000000000000 RSI 0x00000000000000000 **RSP** 0x00007fffffffe010 **RBP** 0x00000000000000000

0x0000555555555018

RIP

```
MEMORY
555555554000
                37 13 00 00 00 00 00 00
                                          7.....
555555554008
                00 00 00 00 00 00 00 00
555555554010
                00 00 00 00 00 00 00 00
55555555000
                48 c7 c0 37 13 00 00 48 |
                                          H..7...H
55555555008
                bb 00 40 55 55 55 50 l
                                          ..auuuu.
                                          .H..H..B
55555555010
                00 48 89 03 48 83 c0 42
55555555018
                50 00 00 00 00 00 00 00
                                         P. . . . . . .
7fffffffe000
                00 00 00 00 00 00 00 00
7fffffffe008
                00 00 00 00 00 00 00 00
7fffffffe010
                00 00 00 00 00 00 00 00
```

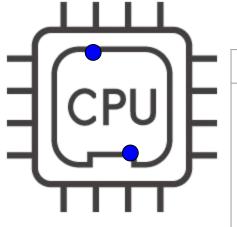
```
mov rax, 0x1337
mov rbx, 0x555555554000
mov qword ptr [rbx], rax
add rax, 0x42
push rax
```



```
MEMORY
555555554000
                37 13 00 00 00 00 00 00
                                          7.....
555555554008
                00 00 00 00 00 00 00 00
555555554010
                00 00 00 00 00 00 00 00
55555555000
                48 c7 c0 37 13 00 00 48 |
                                          H..7...H
55555555008
                bb 00 40 55 55 55 50 l
                                          ..auuuu.
                                          .H..H..B
55555555010
                00 48 89 03 48 83 c0 42
55555555018
                50 00 00 00 00 00 00 00
                                         P. . . . . . .
7fffffffe000
                00 00 00 00 00 00 00 00
7fffffffe008
                39 13 00 00 00 00 00 00
7fffffffe010
                00 00 00 00 00 00 00 00
```

Computation's Effects

```
mov rax, 0x1337
mov rbx, 0x555555554000
mov qword ptr [rbx], rax
add rax, 0x42
push rax
```



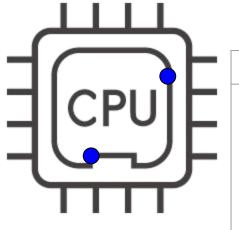
REGISTERS

RAX	0×0000000000000000
RBX	0×0000000000000000
RCX	0×00000000000000000
RDX	0×00000000000000000
RDI	0×00000000000000000
RSI	0×0000000000000000
RSP	0x00007fffffffe010
RBP	0×00000000000000000
RIP	0x000055555555000

MEMORY 555555554000 00 00 00 00 00 00 00 00 555555554008 00 00 00 00 00 00 00 00 555555554010 00 00 00 00 00 00 00 00 55555555000 48 c7 c0 37 13 00 00 48 | H..7...H bb 00 40 55 55 55 55 00 | ...@UUUU. 55555555008 .H..H..B 55555555010 00 48 89 03 48 83 c0 42 | 55555555018 50 00 00 00 00 00 00 00 | P..... 7fffffffe000 00 00 00 00 00 00 00 00 7fffffffe008 00 00 00 00 00 00 00 00 7fffffffe010 00 00 00 00 00 00 00 00

Computation's Effects

```
mov rax, 0x1337
mov rbx, 0x555555554000
mov qword ptr [rbx], rax
add rax, 0x42
push rax
```



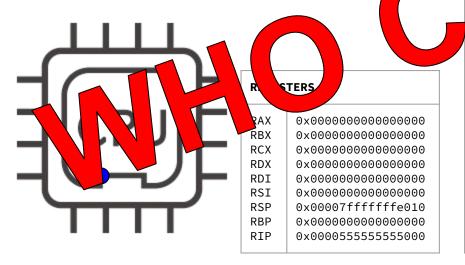
REGISTERS

RAX	0×0000000000000000
RBX	0x0000000000000000
RCX	0×0000000000000000
RDX	0×0000000000000000
RDI	0×0000000000000000
RSI	0×0000000000000000
RSP	0x00007fffffffe010
RBP	0×0000000000000000
RIP	0x0000555555555000

MEMORY 555555554000 00 00 00 00 00 00 00 00 555555554008 00 00 00 00 00 00 00 00 555555554010 00 00 00 00 00 00 00 00 55555555000 48 c7 c0 37 13 00 00 48 | H..7...H bb 00 40 55 55 55 55 00 | ...@UUUU. 55555555008 .H..H..B 55555555010 00 48 89 03 48 83 c0 42 | 55555555018 50 00 00 00 00 00 00 00 | P...... 7fffffffe000 00 00 00 00 00 00 00 00 7fffffffe008 00 00 00 00 00 00 00 00 7fffffffe010 00 00 00 00 00 00 00 00

Computation's Effects

```
mov rax, 0x1337
mov rbx, 0x555555554000
mov qword ptr [rbx], rax
add rax, 0x42
push rax
```

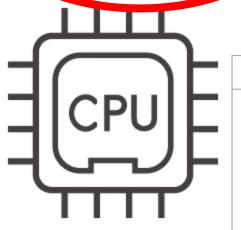


MEMORY 00 00 555555554000 00 00 555555540 5555555401 00 00 ****5000\ 00 00 48 H..7...H bb 00 55 55 55 55 00 .. auuuu. 0 48 89 03 48 83 c0 42 .H..H..B 50 00 00 00 00 00 00 00 7 ffffe000 00 00 00 00 00 00 00 00 7fffffffe008 00 00 00 00 00 00 00 00 7fffffffe010 00 00 00 00 00 00 00 00

Introducing: Hardware

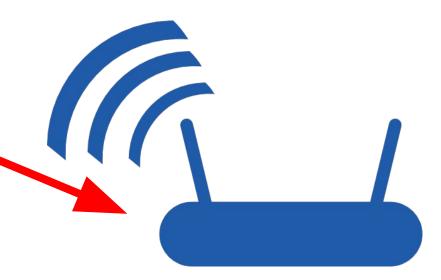


```
mov rax, 0x1337
mov rbx, 0x555555554000
mov qword ptr [rbx], rax
add rax, 0x42
push rax
```



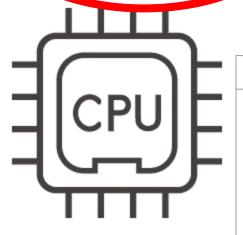
REGISTERS

RAX	0x0000000000000000
RBX	0×0000000000000000
RCX	0×00000000000000000
RDX	0×00000000000000000
RDI	0×00000000000000000
RSI	0×0000000000000000
RSP	0x00007fffffffe010
RBP	0×00000000000000000
RIP	0x000055555555000





```
mov rax, 0x1337
mov rbx, 0x555555554000
mov qword ptr [rbx], rax
add rax, 0x42
push rax
```



REGISTERS

RAX	0×00000000000000000
RBX	0×00000000000000000
RCX	0×00000000000000000
RDX	0×00000000000000000
RDI	0×00000000000000000
RSI	0×00000000000000000
RSP	0x00007fffffffe010
RBP	0×00000000000000000
RIP	0x000055555555000

