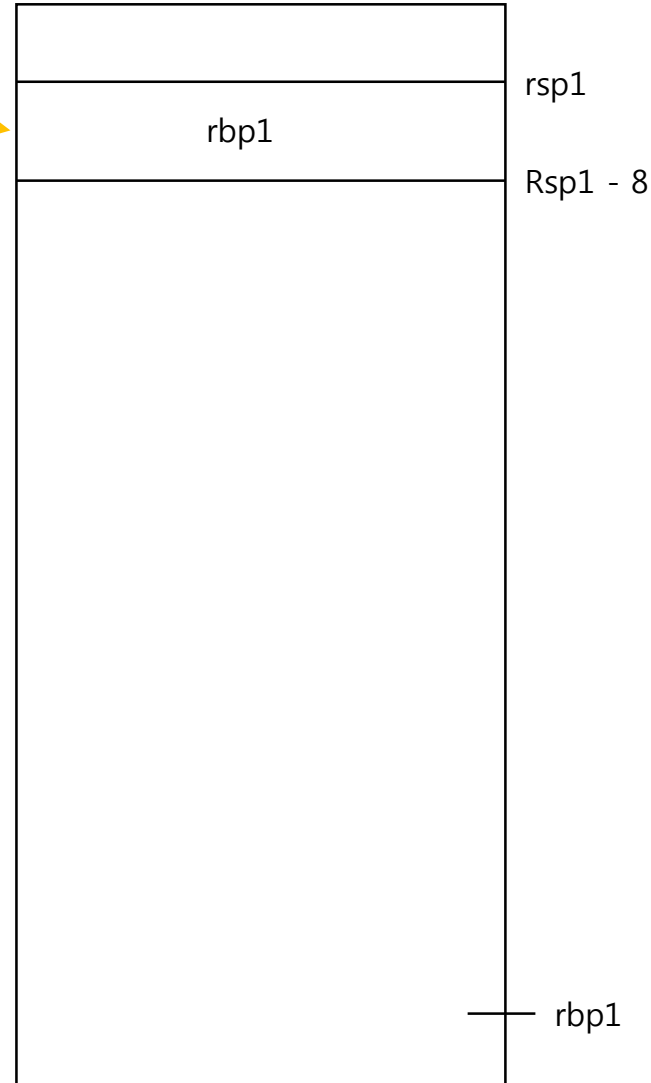


1. 기계어 분석 - (1)

```
Dump of assembler code for function main:
0x0000000000400535 <+0>:  push  %rbp
0x0000000000400536 <+1>:  mov   %rsp,%rbp
0x0000000000400539 <+4>:  sub   $0x10,%rsp
=> 0x000000000040053d <+8>:  movl  $0x3,-0x8(%rbp)
0x0000000000400544 <+15>: mov   -0x8(%rbp),%eax
0x0000000000400547 <+18>: mov   %eax,%edi
0x0000000000400549 <+20>: callq 0x400526 <myfunc>
0x000000000040054e <+25>: mov   %eax,-0x4(%rbp)
0x0000000000400551 <+28>: mov   -0x4(%rbp),%eax
0x0000000000400554 <+31>: mov   %eax,%esi
0x0000000000400556 <+33>: mov   $0x4005f4,%edi
0x000000000040055b <+38>: mov   $0x0,%eax
0x0000000000400560 <+43>: callq 0x400400 <printf@plt>
0x0000000000400565 <+48>: mov   $0x0,%eax
0x000000000040056a <+53>: leaveq
0x000000000040056b <+54>: retq
End of assembler dump.
```

```
Dump of assembler code for function myfunc:
=> 0x0000000000400526 <+0>:  push  %rbp
0x0000000000400527 <+1>:  mov   %rsp,%rbp
0x000000000040052a <+4>:  mov   %edi,-0x4(%rbp)
0x000000000040052d <+7>:  mov   -0x4(%rbp),%eax
0x0000000000400530 <+10>: add   $0x3,%eax
0x0000000000400533 <+13>: pop   %rbp
0x0000000000400534 <+14>: retq
End of assembler dump.
```

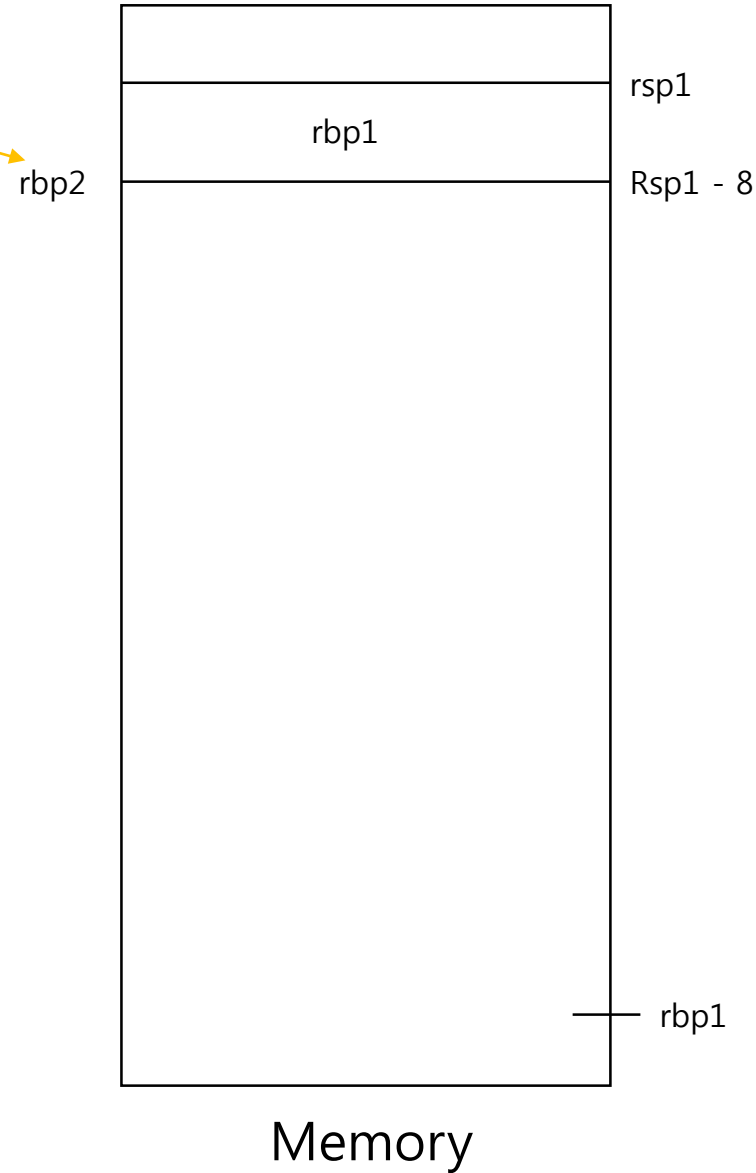


Memory

1. 기계어 분석 - (2)

```
Dump of assembler code for function main:
0x0000000000400535 <+0>:  push  %rbp
0x0000000000400536 <+1>:  mov   %rsp,%rbp
0x0000000000400539 <+4>:  sub   $0x10,%rsp
=> 0x000000000040053d <+8>:  movl  $0x3,-0x8(%rbp)
0x0000000000400544 <+15>: mov   -0x8(%rbp),%eax
0x0000000000400547 <+18>: mov   %eax,%edi
0x0000000000400549 <+20>: callq 0x400526 <myfunc>
0x000000000040054e <+25>: mov   %eax,-0x4(%rbp)
0x0000000000400551 <+28>: mov   -0x4(%rbp),%eax
0x0000000000400554 <+31>: mov   %eax,%esi
0x0000000000400556 <+33>: mov   $0x4005f4,%edi
0x000000000040055b <+38>: mov   $0x0,%eax
0x0000000000400560 <+43>: callq 0x400400 <printf@plt>
0x0000000000400565 <+48>: mov   $0x0,%eax
0x000000000040056a <+53>: leaveq
0x000000000040056b <+54>: retq
End of assembler dump.
```

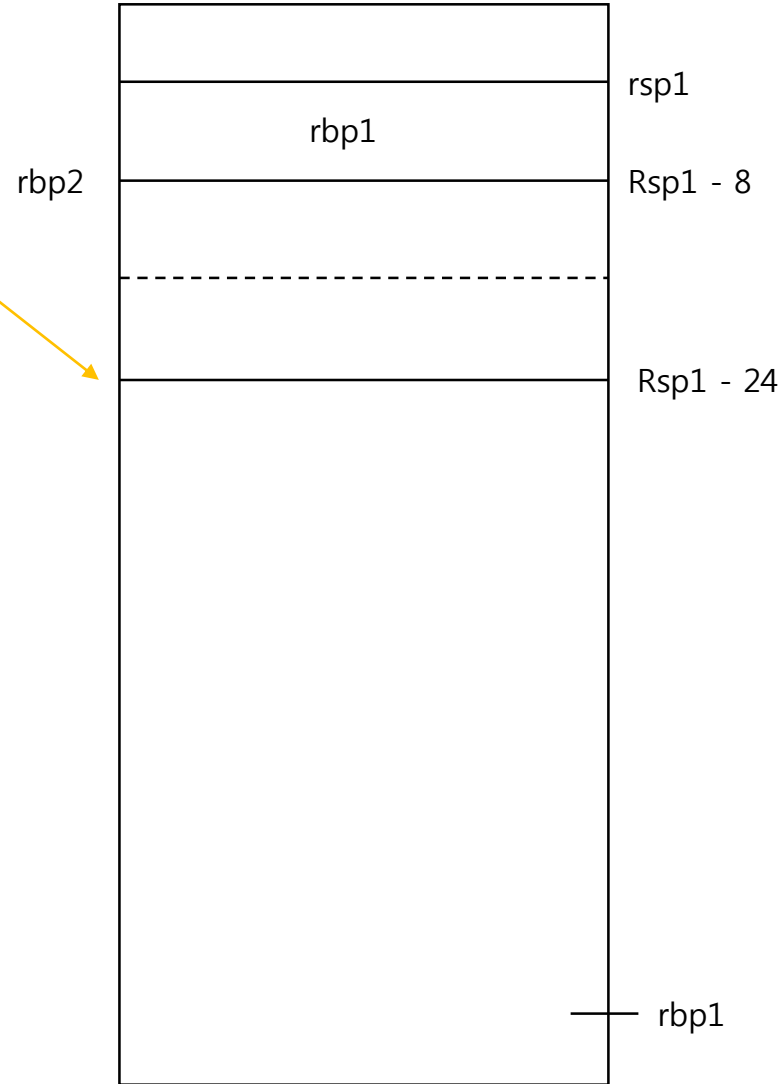
```
Dump of assembler code for function myfunc:
=> 0x0000000000400526 <+0>:  push  %rbp
0x0000000000400527 <+1>:  mov   %rsp,%rbp
0x000000000040052a <+4>:  mov   %edi,-0x4(%rbp)
0x000000000040052d <+7>:  mov   -0x4(%rbp),%eax
0x0000000000400530 <+10>: add   $0x3,%eax
0x0000000000400533 <+13>: pop   %rbp
0x0000000000400534 <+14>: retq
End of assembler dump.
```



1. 기계어 분석 - (3)

```
Dump of assembler code for function main:
0x0000000000400535 <+0>:  push  %rbp
0x0000000000400536 <+1>:  mov   %rsp,%rbp
0x0000000000400539 <+4>:  sub   $0x10,%rsp
=> 0x000000000040053d <+8>:  movl  $0x3,-0x8(%rbp)
0x0000000000400544 <+15>: mov   -0x8(%rbp),%eax
0x0000000000400547 <+18>: mov   %eax,%edi
0x0000000000400549 <+20>: callq 0x400526 <myfunc>
0x000000000040054e <+25>: mov   %eax,-0x4(%rbp)
0x0000000000400551 <+28>: mov   -0x4(%rbp),%eax
0x0000000000400554 <+31>: mov   %eax,%esi
0x0000000000400556 <+33>: mov   $0x4005f4,%edi
0x000000000040055b <+38>: mov   $0x0,%eax
0x0000000000400560 <+43>: callq 0x400400 <printf@plt>
0x0000000000400565 <+48>: mov   $0x0,%eax
0x000000000040056a <+53>: leaveq
0x000000000040056b <+54>: retq
End of assembler dump.
```

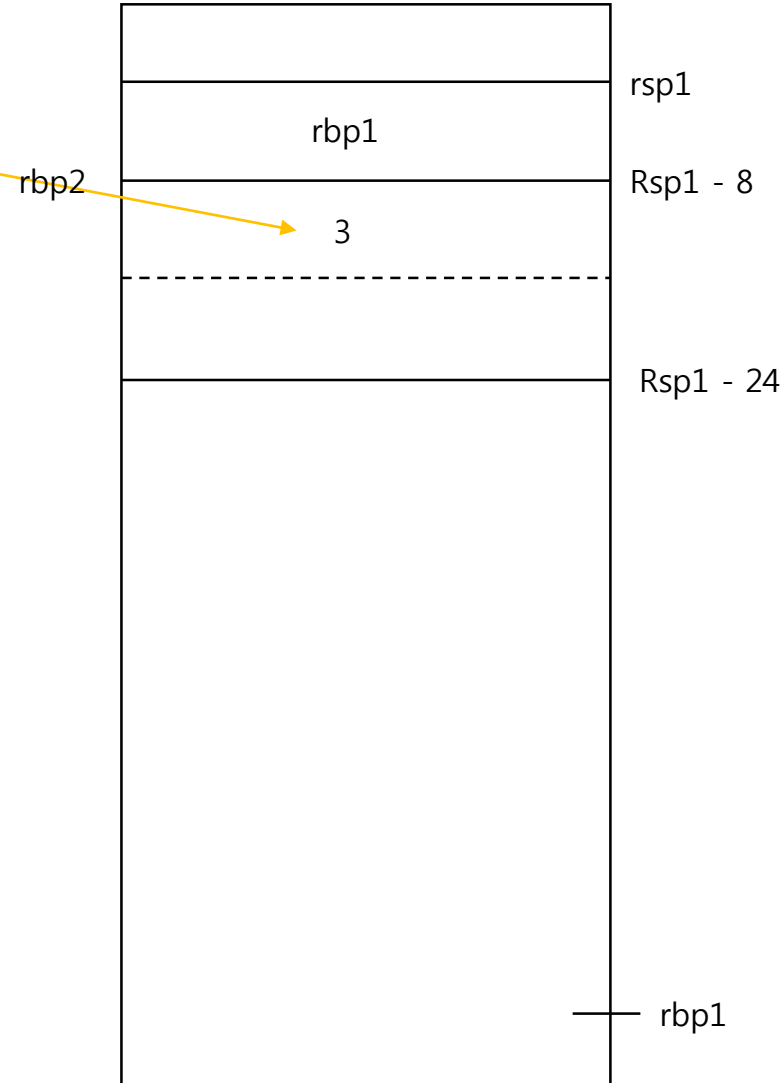
```
Dump of assembler code for function myfunc:
=> 0x0000000000400526 <+0>:  push  %rbp
0x0000000000400527 <+1>:  mov   %rsp,%rbp
0x000000000040052a <+4>:  mov   %edi,-0x4(%rbp)
0x000000000040052d <+7>:  mov   -0x4(%rbp),%eax
0x0000000000400530 <+10>: add   $0x3,%eax
0x0000000000400533 <+13>: pop   %rbp
0x0000000000400534 <+14>: retq
End of assembler dump.
```



1. 기계어 분석 - (4)

```
Dump of assembler code for function main:
0x0000000000400535 <+0>:  push  %rbp
0x0000000000400536 <+1>:  mov   %rsp,%rbp
0x0000000000400539 <+4>:  sub   $0x10,%rsp
=> 0x000000000040053d <+8>:  movl  $0x3,-0x8(%rbp)
0x0000000000400544 <+15>: mov   -0x8(%rbp),%eax
0x0000000000400547 <+18>: mov   %eax,%edi
0x0000000000400549 <+20>: callq 0x400526 <myfunc>
0x000000000040054e <+25>: mov   %eax,-0x4(%rbp)
0x0000000000400551 <+28>: mov   -0x4(%rbp),%eax
0x0000000000400554 <+31>: mov   %eax,%esi
0x0000000000400556 <+33>: mov   $0x4005f4,%edi
0x000000000040055b <+38>: mov   $0x0,%eax
0x0000000000400560 <+43>: callq 0x400400 <printf@plt>
0x0000000000400565 <+48>: mov   $0x0,%eax
0x000000000040056a <+53>: leaveq
0x000000000040056b <+54>: retq
End of assembler dump.
```

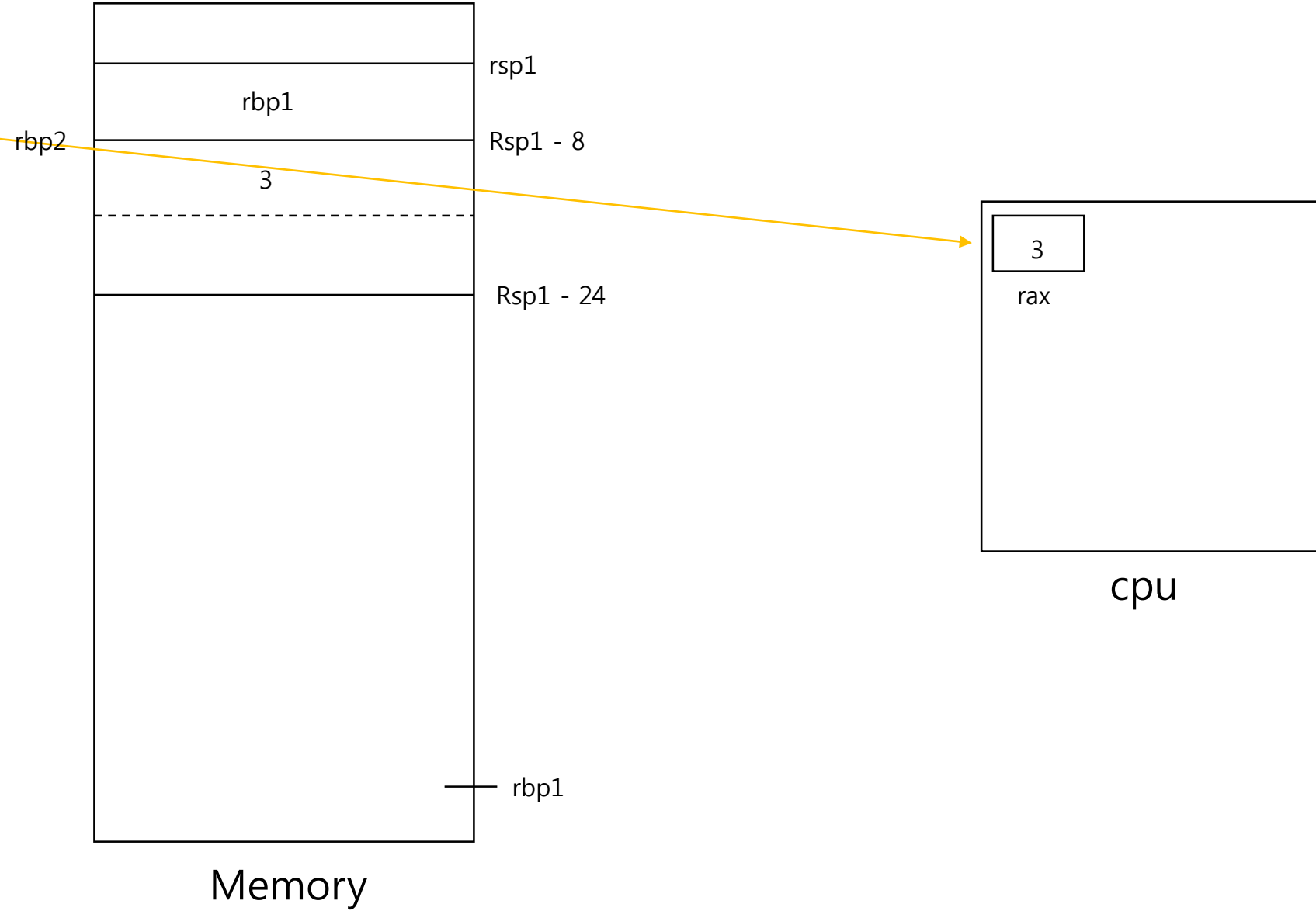
```
Dump of assembler code for function myfunc:
=> 0x0000000000400526 <+0>:  push  %rbp
0x0000000000400527 <+1>:  mov   %rsp,%rbp
0x000000000040052a <+4>:  mov   %edi,-0x4(%rbp)
0x000000000040052d <+7>:  mov   -0x4(%rbp),%eax
0x0000000000400530 <+10>: add   $0x3,%eax
0x0000000000400533 <+13>: pop   %rbp
0x0000000000400534 <+14>: retq
End of assembler dump.
```



1. 기계어 분석 - (5)

```
Dump of assembler code for function main:
0x0000000000400535 <+0>:  push  %rbp
0x0000000000400536 <+1>:  mov   %rsp,%rbp
0x0000000000400539 <+4>:  sub   $0x10,%rsp
=> 0x000000000040053d <+8>:  movl  $0x3,-0x8(%rbp)
0x0000000000400544 <+15>: mov   -0x8(%rbp),%eax
0x0000000000400547 <+18>: mov   %eax,%edi
0x0000000000400549 <+20>: callq 0x400526 <myfunc>
0x000000000040054e <+25>: mov   %eax,-0x4(%rbp)
0x0000000000400551 <+28>: mov   -0x4(%rbp),%eax
0x0000000000400554 <+31>: mov   %eax,%esi
0x0000000000400556 <+33>: mov   $0x4005f4,%edi
0x000000000040055b <+38>: mov   $0x0,%eax
0x0000000000400560 <+43>: callq 0x400400 <printf@plt>
0x0000000000400565 <+48>: mov   $0x0,%eax
0x000000000040056a <+53>: leaveq
0x000000000040056b <+54>: retq
End of assembler dump.
```

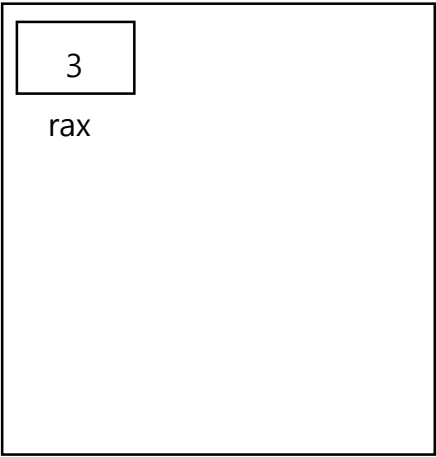
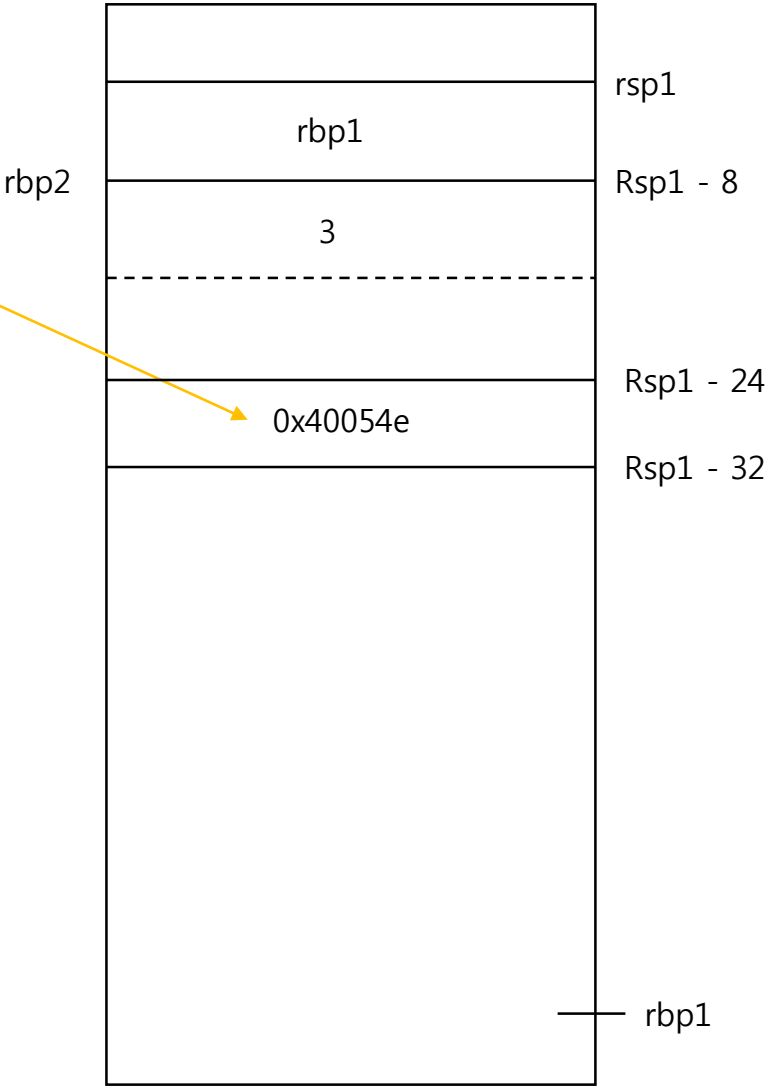
```
Dump of assembler code for function myfunc:
=> 0x0000000000400526 <+0>:  push  %rbp
0x0000000000400527 <+1>:  mov   %rsp,%rbp
0x000000000040052a <+4>:  mov   %edi,-0x4(%rbp)
0x000000000040052d <+7>:  mov   -0x4(%rbp),%eax
0x0000000000400530 <+10>: add   $0x3,%eax
0x0000000000400533 <+13>: pop   %rbp
0x0000000000400534 <+14>: retq
End of assembler dump.
```



1. 기계어 분석 - (6)

```
Dump of assembler code for function main:
0x0000000000400535 <+0>:  push %rbp
0x0000000000400536 <+1>:  mov  %rsp,%rbp
0x0000000000400539 <+4>:  sub  $0x10,%rsp
=> 0x000000000040053d <+8>:  movl $0x3,-0x8(%rbp)
0x0000000000400544 <+15>: mov  -0x8(%rbp),%eax
0x0000000000400547 <+18>: mov  %eax,%edi
0x0000000000400549 <+20>: callq 0x400526 <myfunc>
0x000000000040054e <+25>: mov  %eax,-0x4(%rbp)
0x0000000000400551 <+28>: mov  -0x4(%rbp),%eax
0x0000000000400554 <+31>: mov  %eax,%esi
0x0000000000400556 <+33>: mov  $0x4005f4,%edi
0x000000000040055b <+38>: mov  $0x0,%eax
0x0000000000400560 <+43>: callq 0x400400 <printf@plt>
0x0000000000400565 <+48>: mov  $0x0,%eax
0x000000000040056a <+53>: leaveq
0x000000000040056b <+54>: retq
End of assembler dump.
```

```
Dump of assembler code for function myfunc:
=> 0x0000000000400526 <+0>:  push %rbp
0x0000000000400527 <+1>:  mov  %rsp,%rbp
0x000000000040052a <+4>:  mov  %edi,-0x4(%rbp)
0x000000000040052d <+7>:  mov  -0x4(%rbp),%eax
0x0000000000400530 <+10>: add  $0x3,%eax
0x0000000000400533 <+13>: pop  %rbp
0x0000000000400534 <+14>: retq
End of assembler dump.
```



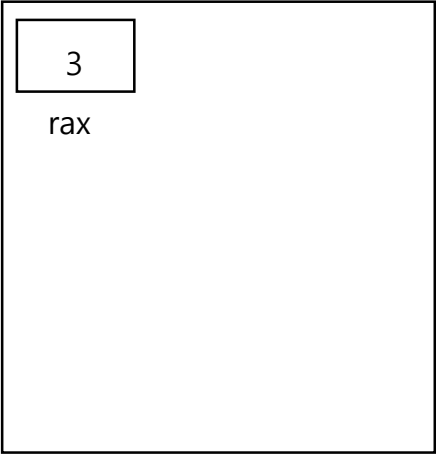
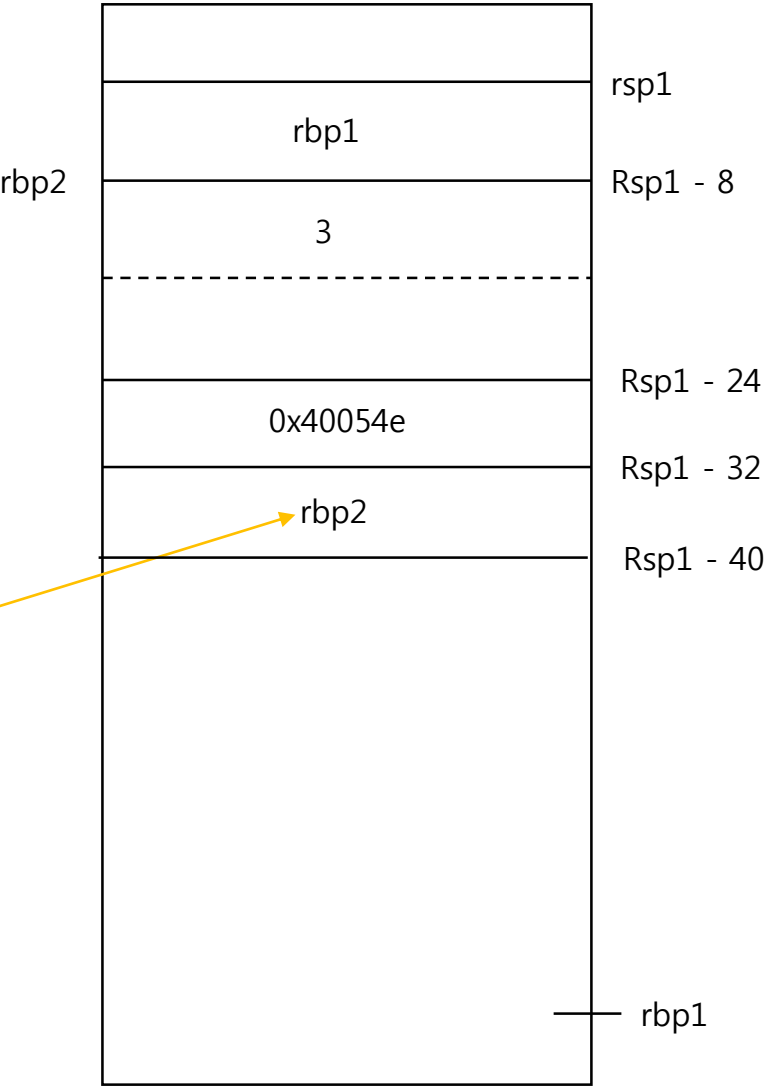
cpu

Memory

1. 기계어 분석 - (7)

```
Dump of assembler code for function main:
0x0000000000400535 <+0>:  push  %rbp
0x0000000000400536 <+1>:  mov   %rsp,%rbp
0x0000000000400539 <+4>:  sub   $0x10,%rsp
=> 0x000000000040053d <+8>:  movl  $0x3,-0x8(%rbp)
0x0000000000400544 <+15>: mov   -0x8(%rbp),%eax
0x0000000000400547 <+18>: mov   %eax,%edi
0x0000000000400549 <+20>: callq 0x400526 <myfunc>
0x000000000040054e <+25>: mov   %eax,-0x4(%rbp)
0x0000000000400551 <+28>: mov   -0x4(%rbp),%eax
0x0000000000400554 <+31>: mov   %eax,%esi
0x0000000000400556 <+33>: mov   $0x4005f4,%edi
0x000000000040055b <+38>: mov   $0x0,%eax
0x0000000000400560 <+43>: callq 0x400400 <printf@plt>
0x0000000000400565 <+48>: mov   $0x0,%eax
0x000000000040056a <+53>: leaveq
0x000000000040056b <+54>: retq
End of assembler dump.
```

```
Dump of assembler code for function myfunc:
=> 0x0000000000400526 <+0>:  push  %rbp
0x0000000000400527 <+1>:  mov   %rsp,%rbp
0x000000000040052a <+4>:  mov   %edi,-0x4(%rbp)
0x000000000040052d <+7>:  mov   -0x4(%rbp),%eax
0x0000000000400530 <+10>: add   $0x3,%eax
0x0000000000400533 <+13>: pop   %rbp
0x0000000000400534 <+14>: retq
End of assembler dump.
```



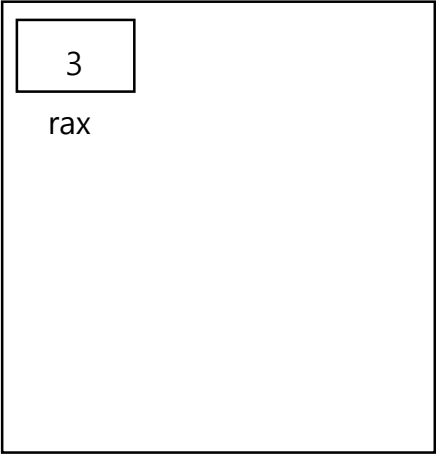
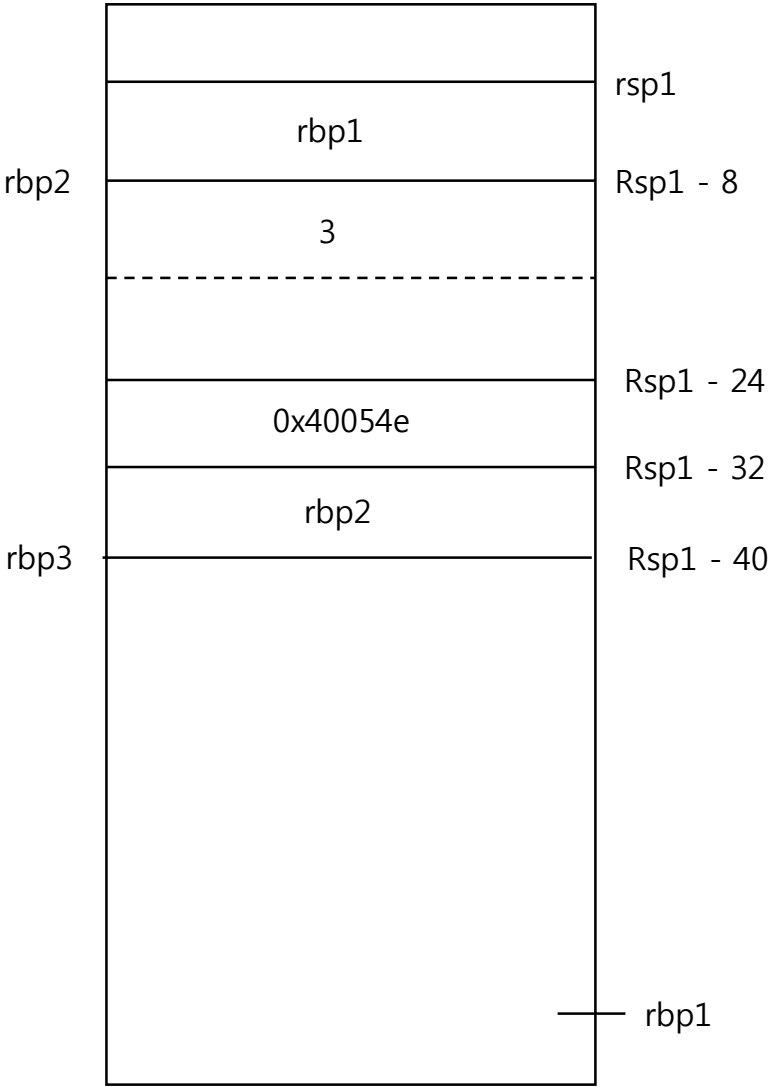
Memory

cpu

1. 기계어 분석 - (8)

```
Dump of assembler code for function main:
0x0000000000400535 <+0>:  push  %rbp
0x0000000000400536 <+1>:  mov   %rsp,%rbp
0x0000000000400539 <+4>:  sub   $0x10,%rsp
=> 0x000000000040053d <+8>:  movl  $0x3,-0x8(%rbp)
0x0000000000400544 <+15>: mov   -0x8(%rbp),%eax
0x0000000000400547 <+18>: mov   %eax,%edi
0x0000000000400549 <+20>: callq 0x400526 <myfunc>
0x000000000040054e <+25>: mov   %eax,-0x4(%rbp)
0x0000000000400551 <+28>: mov   -0x4(%rbp),%eax
0x0000000000400554 <+31>: mov   %eax,%esi
0x0000000000400556 <+33>: mov   $0x4005f4,%edi
0x000000000040055b <+38>: mov   $0x0,%eax
0x0000000000400560 <+43>: callq 0x400400 <printf@plt>
0x0000000000400565 <+48>: mov   $0x0,%eax
0x000000000040056a <+53>: leaveq
0x000000000040056b <+54>: retq
End of assembler dump.
```

```
Dump of assembler code for function myfunc:
=> 0x0000000000400526 <+0>:  push  %rbp
0x0000000000400527 <+1>:  mov   %rsp,%rbp
0x000000000040052a <+4>:  mov   %edi,-0x4(%rbp)
0x000000000040052d <+7>:  mov   -0x4(%rbp),%eax
0x0000000000400530 <+10>: add   $0x3,%eax
0x0000000000400533 <+13>: pop   %rbp
0x0000000000400534 <+14>: retq
End of assembler dump.
```



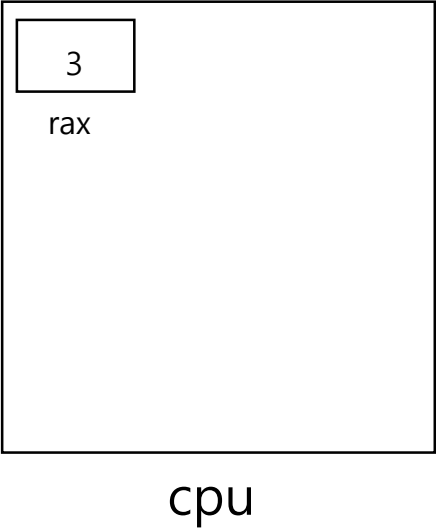
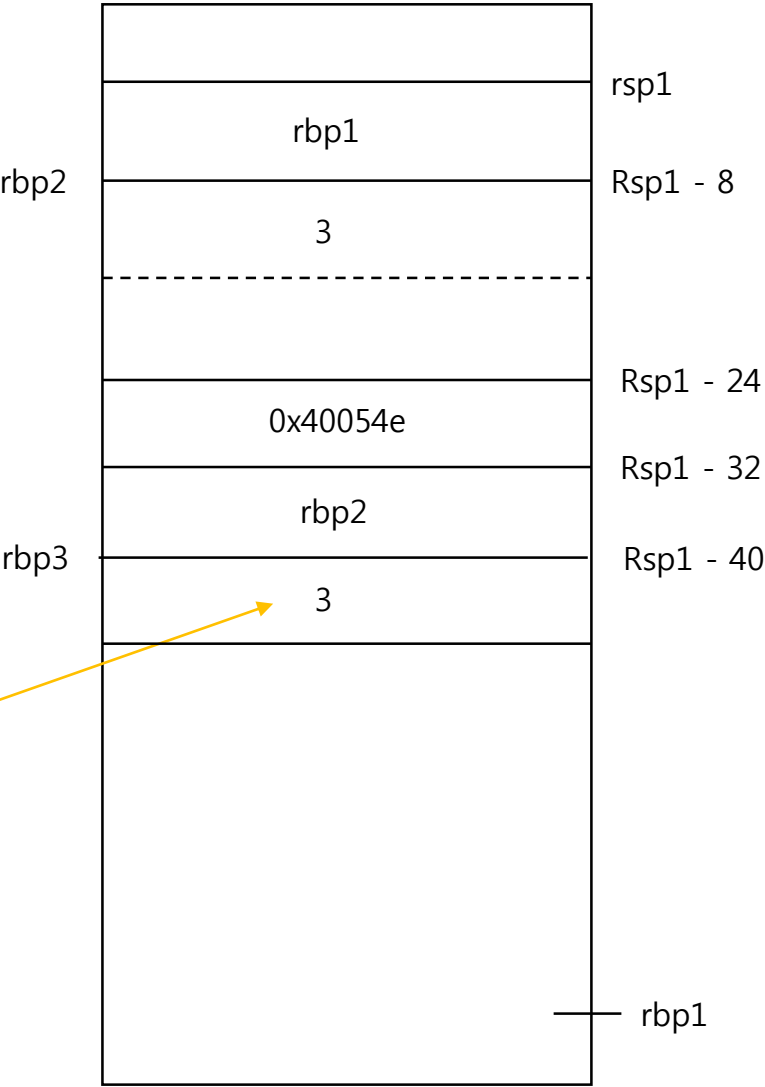
cpu

Memory

1. 기계어 분석 - (9)

```
Dump of assembler code for function main:
0x0000000000400535 <+0>:  push  %rbp
0x0000000000400536 <+1>:  mov   %rsp,%rbp
0x0000000000400539 <+4>:  sub   $0x10,%rsp
=> 0x000000000040053d <+8>:  movl  $0x3,-0x8(%rbp)
0x0000000000400544 <+15>: mov   -0x8(%rbp),%eax
0x0000000000400547 <+18>: mov   %eax,%edi
0x0000000000400549 <+20>: callq 0x400526 <myfunc>
0x000000000040054e <+25>: mov   %eax,-0x4(%rbp)
0x0000000000400551 <+28>: mov   -0x4(%rbp),%eax
0x0000000000400554 <+31>: mov   %eax,%esi
0x0000000000400556 <+33>: mov   $0x4005f4,%edi
0x000000000040055b <+38>: mov   $0x0,%eax
0x0000000000400560 <+43>: callq 0x400400 <printf@plt>
0x0000000000400565 <+48>: mov   $0x0,%eax
0x000000000040056a <+53>: leaveq
0x000000000040056b <+54>: retq
End of assembler dump.
```

```
Dump of assembler code for function myfunc:
=> 0x0000000000400526 <+0>:  push  %rbp
0x0000000000400527 <+1>:  mov   %rsp,%rbp
0x000000000040052a <+4>:  mov   %edi,-0x4(%rbp)
0x000000000040052d <+7>:  mov   -0x4(%rbp),%eax
0x0000000000400530 <+10>: add   $0x3,%eax
0x0000000000400533 <+13>: pop   %rbp
0x0000000000400534 <+14>: retq
End of assembler dump.
```

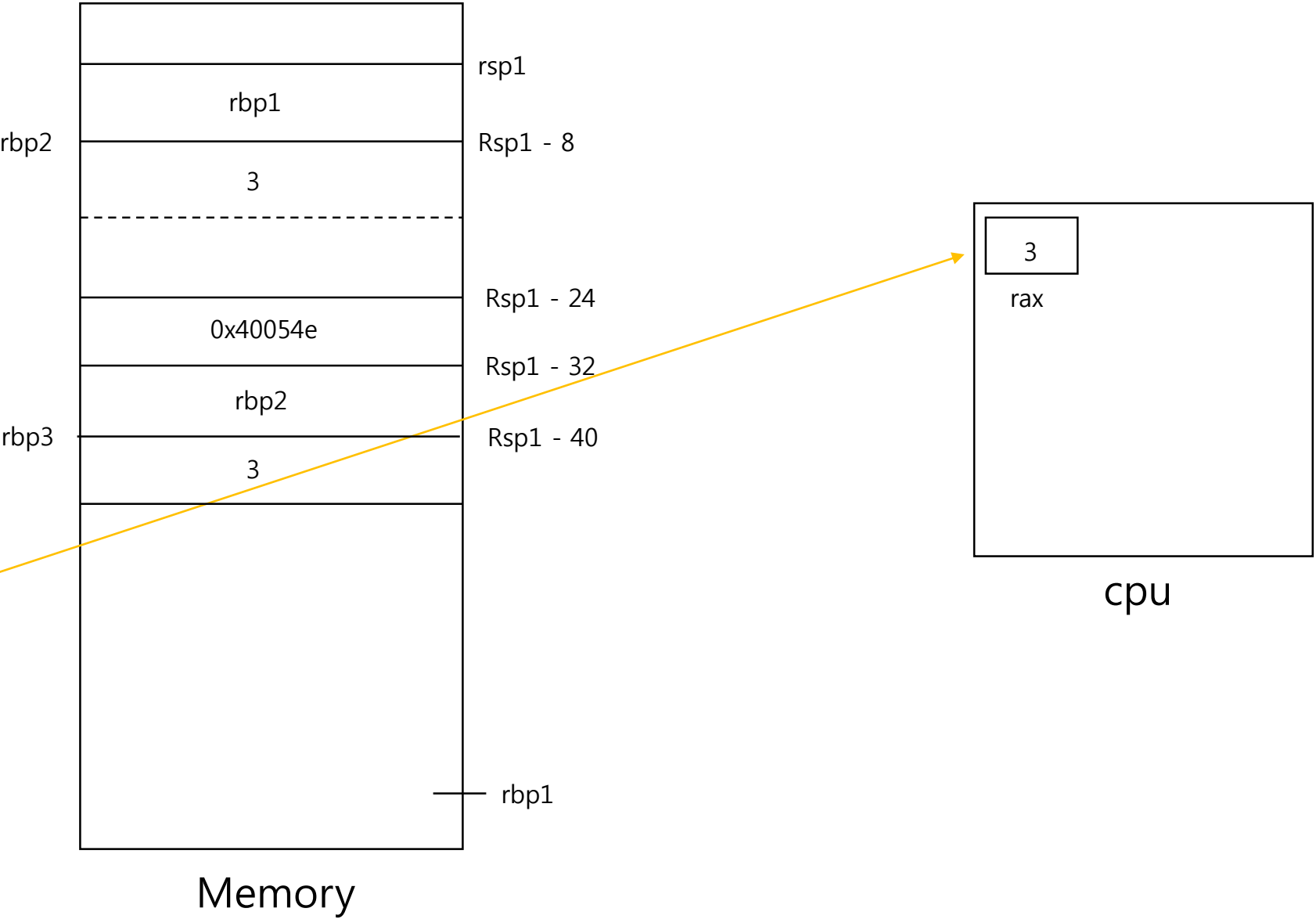


Memory

1. 기계어 분석 - (10)

```
Dump of assembler code for function main:
0x0000000000400535 <+0>:  push  %rbp
0x0000000000400536 <+1>:  mov   %rsp,%rbp
0x0000000000400539 <+4>:  sub   $0x10,%rsp
=> 0x000000000040053d <+8>:  movl  $0x3,-0x8(%rbp)
0x0000000000400544 <+15>: mov   -0x8(%rbp),%eax
0x0000000000400547 <+18>: mov   %eax,%edi
0x0000000000400549 <+20>: callq 0x400526 <myfunc>
0x000000000040054e <+25>: mov   %eax,-0x4(%rbp)
0x0000000000400551 <+28>: mov   -0x4(%rbp),%eax
0x0000000000400554 <+31>: mov   %eax,%esi
0x0000000000400556 <+33>: mov   $0x4005f4,%edi
0x000000000040055b <+38>: mov   $0x0,%eax
0x0000000000400560 <+43>: callq 0x400400 <printf@plt>
0x0000000000400565 <+48>: mov   $0x0,%eax
0x000000000040056a <+53>: leaveq
0x000000000040056b <+54>: retq
End of assembler dump.
```

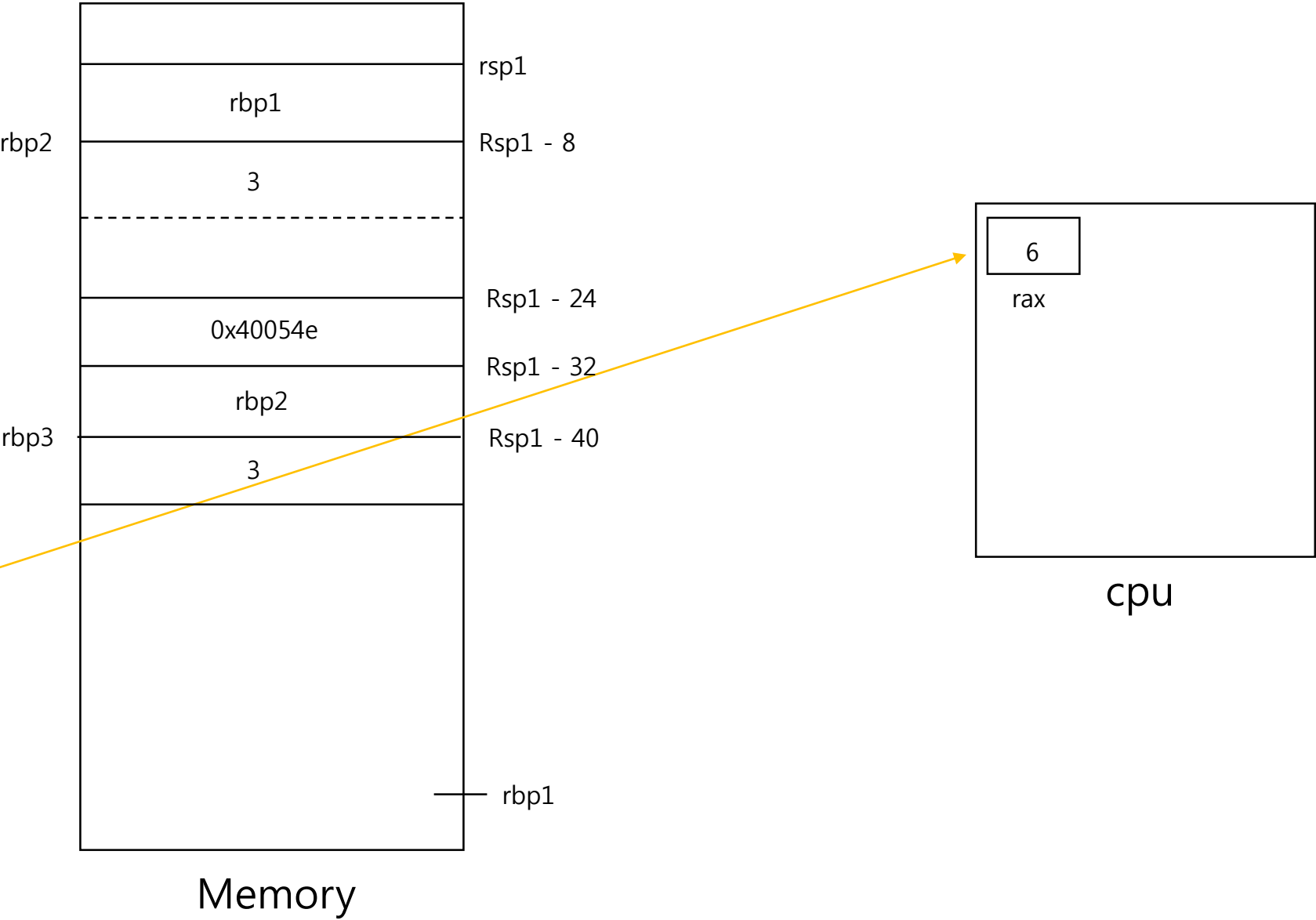
```
Dump of assembler code for function myfunc:
=> 0x0000000000400526 <+0>:  push  %rbp
0x0000000000400527 <+1>:  mov   %rsp,%rbp
0x000000000040052a <+4>:  mov   %edi,-0x4(%rbp)
0x000000000040052d <+7>:  mov   -0x4(%rbp),%eax
0x0000000000400530 <+10>: add   $0x3,%eax
0x0000000000400533 <+13>: pop   %rbp
0x0000000000400534 <+14>: retq
End of assembler dump.
```



1. 기계어 분석 - (11)

```
Dump of assembler code for function main:
0x0000000000400535 <+0>:  push  %rbp
0x0000000000400536 <+1>:  mov   %rsp,%rbp
0x0000000000400539 <+4>:  sub   $0x10,%rsp
=> 0x000000000040053d <+8>:  movl  $0x3,-0x8(%rbp)
0x0000000000400544 <+15>:  mov   -0x8(%rbp),%eax
0x0000000000400547 <+18>:  mov   %eax,%edi
0x0000000000400549 <+20>:  callq 0x400526 <myfunc>
0x000000000040054e <+25>:  mov   %eax,-0x4(%rbp)
0x0000000000400551 <+28>:  mov   -0x4(%rbp),%eax
0x0000000000400554 <+31>:  mov   %eax,%esi
0x0000000000400556 <+33>:  mov   $0x4005f4,%edi
0x000000000040055b <+38>:  mov   $0x0,%eax
0x0000000000400560 <+43>:  callq 0x400400 <printf@plt>
0x0000000000400565 <+48>:  mov   $0x0,%eax
0x000000000040056a <+53>:  leaveq
0x000000000040056b <+54>:  retq
End of assembler dump.
```

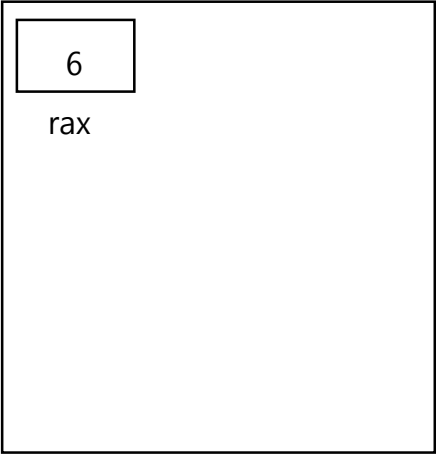
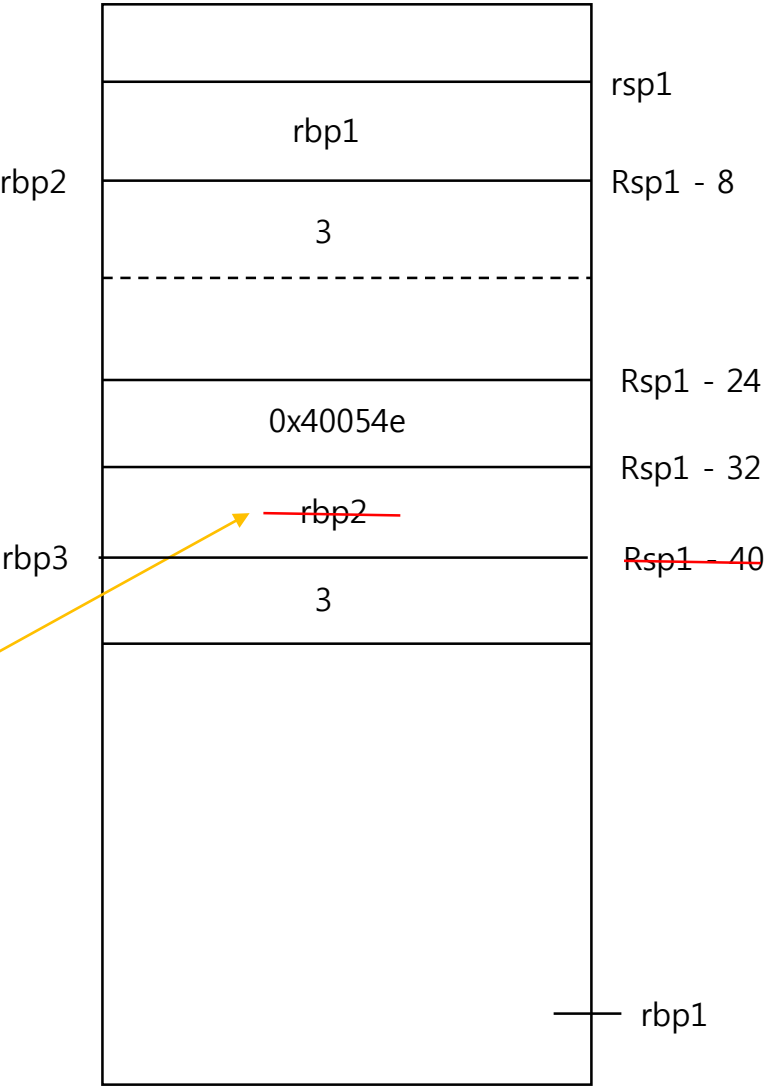
```
Dump of assembler code for function myfunc:
=> 0x0000000000400526 <+0>:  push  %rbp
0x0000000000400527 <+1>:  mov   %rsp,%rbp
0x000000000040052a <+4>:  mov   %edi,-0x4(%rbp)
0x000000000040052d <+7>:  mov   -0x4(%rbp),%eax
0x0000000000400530 <+10>: add   $0x3,%eax
0x0000000000400533 <+13>: pop   %rbp
0x0000000000400534 <+14>: retq
End of assembler dump.
```



1. 기계어 분석 - (12)

```
Dump of assembler code for function main:
0x0000000000400535 <+0>:  push  %rbp
0x0000000000400536 <+1>:  mov   %rsp,%rbp
0x0000000000400539 <+4>:  sub   $0x10,%rsp
=> 0x000000000040053d <+8>:  movl  $0x3,-0x8(%rbp)
0x0000000000400544 <+15>: mov   -0x8(%rbp),%eax
0x0000000000400547 <+18>: mov   %eax,%edi
0x0000000000400549 <+20>: callq 0x400526 <myfunc>
0x000000000040054e <+25>: mov   %eax,-0x4(%rbp)
0x0000000000400551 <+28>: mov   -0x4(%rbp),%eax
0x0000000000400554 <+31>: mov   %eax,%esi
0x0000000000400556 <+33>: mov   $0x4005f4,%edi
0x000000000040055b <+38>: mov   $0x0,%eax
0x0000000000400560 <+43>: callq 0x400400 <printf@plt>
0x0000000000400565 <+48>: mov   $0x0,%eax
0x000000000040056a <+53>: leaveq
0x000000000040056b <+54>: retq
End of assembler dump.
```

```
Dump of assembler code for function myfunc:
=> 0x0000000000400526 <+0>:  push  %rbp
0x0000000000400527 <+1>:  mov   %rsp,%rbp
0x000000000040052a <+4>:  mov   %edi,-0x4(%rbp)
0x000000000040052d <+7>:  mov   -0x4(%rbp),%eax
0x0000000000400530 <+10>: add   $0x3,%eax
0x0000000000400533 <+13>: pop   %rbp
0x0000000000400534 <+14>: retq
End of assembler dump.
```



Memory

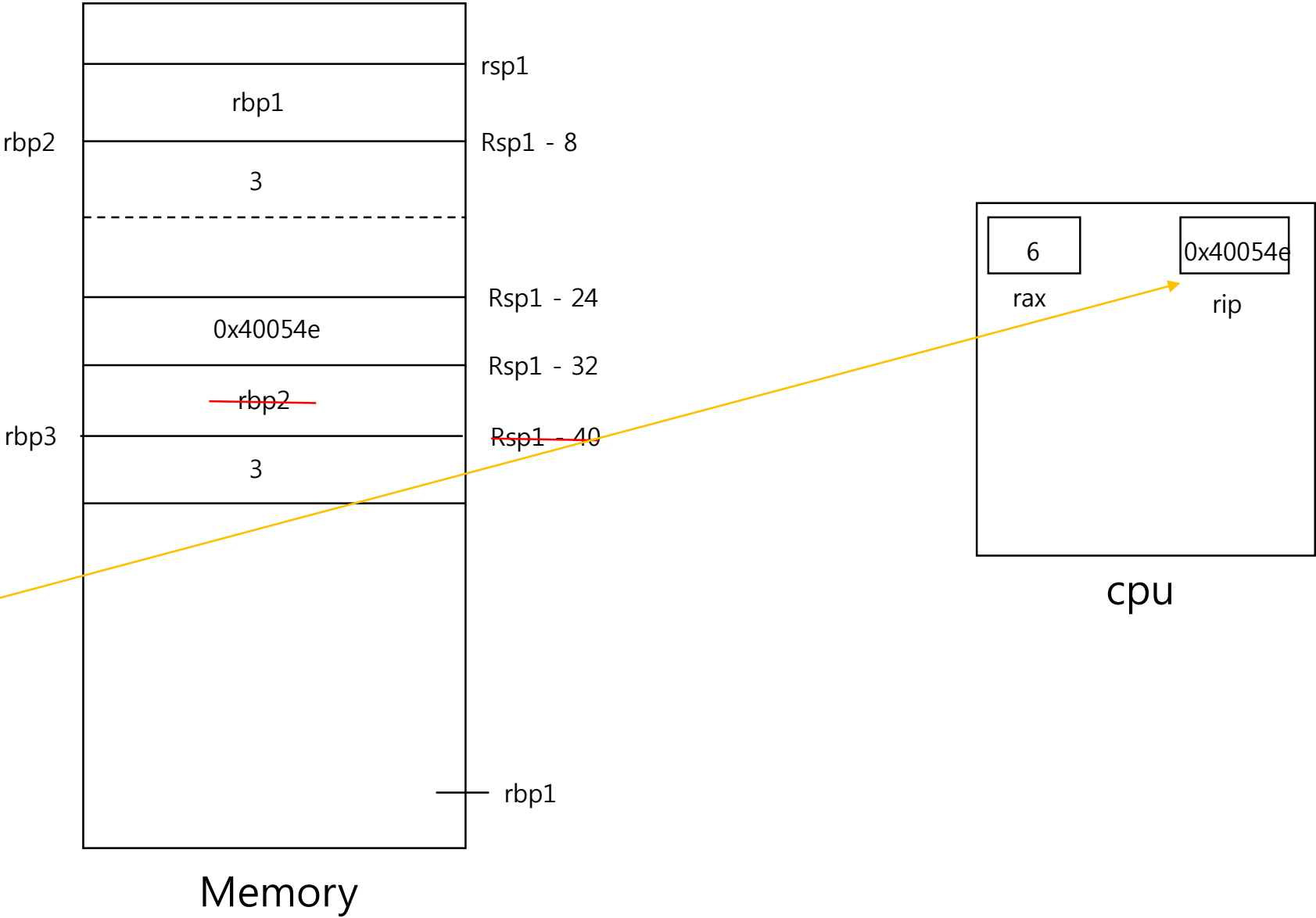
cpu

1. 기계어 분석 - (13)

```
Dump of assembler code for function main:
0x0000000000400535 <+0>:  push  %rbp
0x0000000000400536 <+1>:  mov   %rsp,%rbp
0x0000000000400539 <+4>:  sub   $0x10,%rsp
=> 0x000000000040053d <+8>:  movl  $0x3,-0x8(%rbp)
0x0000000000400544 <+15>:  mov   -0x8(%rbp),%eax
0x0000000000400547 <+18>:  mov   %eax,%edi
0x0000000000400549 <+20>:  callq 0x400526 <myfunc>
0x000000000040054e <+25>:  mov   %eax,-0x4(%rbp)
0x0000000000400551 <+28>:  mov   -0x4(%rbp),%eax
0x0000000000400554 <+31>:  mov   %eax,%esi
0x0000000000400556 <+33>:  mov   $0x4005f4,%edi
0x000000000040055b <+38>:  mov   $0x0,%eax
0x0000000000400560 <+43>:  callq 0x400400 <printf@plt>
0x0000000000400565 <+48>:  mov   $0x0,%eax
0x000000000040056a <+53>:  leaveq
0x000000000040056b <+54>:  retq
End of assembler dump.
```

```
Dump of assembler code for function myfunc:
=> 0x0000000000400526 <+0>:  push  %rbp
0x0000000000400527 <+1>:  mov   %rsp,%rbp
0x000000000040052a <+4>:  mov   %edi,-0x4(%rbp)
0x000000000040052d <+7>:  mov   -0x4(%rbp),%eax
0x0000000000400530 <+10>: add   $0x3,%eax
0x0000000000400533 <+13>: pop   %rbp
0x0000000000400534 <+14>: retq
End of assembler dump.
```

Pop rip



2. 포인터 크기 내용 정리

- 8 비트 시스템 - 1byte
- 16 비트 -> 2byte
- 32 비트 -> 4byte
- 64 비트 -> 8byte

Why?

컴퓨터의 산술 연산은 ALU에 의존적임.

ALU의 연산은 범용 레지스터에 종속적이고 컴퓨터가 64비트라는 의미는 레지스터들이 64bit으로 구성 되었음을 의미함.

변수의 정의는 메모리에 정보를 저장하는 공간.

포인터의 정의는 메모리에 주소를 저장하는 공간이다.

그렇다면, 64bit으로 표현할 수 있는 최대값 또한 저장할 수 있어야 함.

즉, 포인터의 크기가 작다면 64bit 주소를 표현할 방법이 없기 때문에 최대치인 64bit(8byte)가 포인터의 크기가 된 것임.

3. 2진수 16진수 변환 정리

- 2진수 1자리
0 1 -> 2개
- 2진수 2자리
00 01 10 11 -> 4개
- 2진수 3자리
000 001 010 011 100 101 110 111 -> 8개
- 2진수 4자리 ---> 16개

- 16진수 1자리
0 ~ 15 16개
- 16진수 2자리
--- 256개

3. 2진수 16진수 변환 정리

- 16진수 표기법
- 1. 0 0
- 2. 1 1
- 3. 2 2
- 4. 3 3
- 5. 4 4
- 6. 5 5
- 7. 6 6
- 8. 7 7
- 9. 8 8
- 10. 9 9
- 11. 10 a
- 12. 11 b
- 13. 12 c
- 14. 13 d
- 15. 14 e
- 16. 15 f

10진수 33을 2진수 및 16진수로 표기법

$33 = 32 + 1$

32	16	8	4	2	1
1	0	0	0	0	1

10 0001

8421 8421 (4개씩 끊어 쓰면 편함)
0010 0001

0x2 1

$0x21 => 2 \times 16^1 + 1 \times 16^0 = 33$