

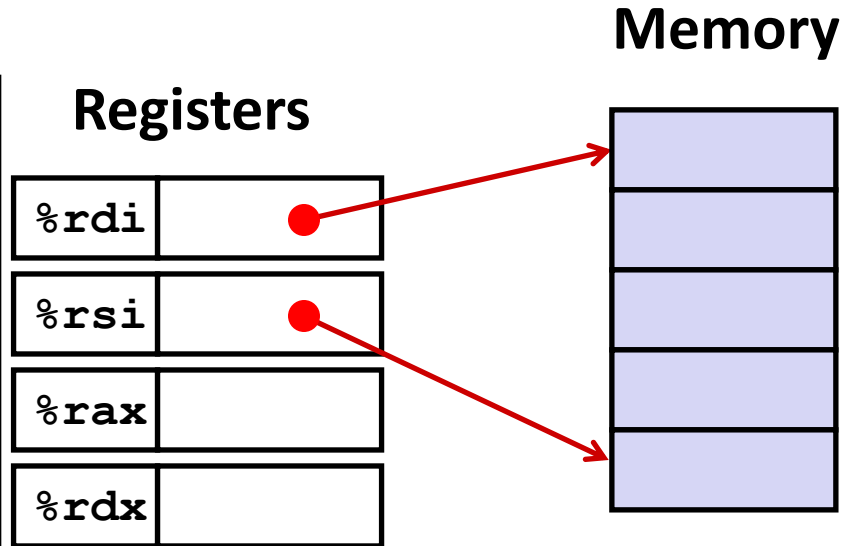
# Example of Basic Addressing Modes

```
void swap
(long *xp, long *yp)
{
    long t0 = *xp;
    long t1 = *yp;
    *xp = t1;
    *yp = t0;
}
```

```
swap:
    movq    (%rdi), %rax
    movq    (%rsi), %rdx
    movq    %rdx, (%rdi)
    movq    %rax, (%rsi)
    ret
```

# Understanding Swap()

```
void swap
(long *xp, long *yp)
{
    long t0 = *xp;
    long t1 = *yp;
    *xp = t1;
    *yp = t0;
}
```



Register	Value
%rdi	xp
%rsi	yp
%rax	t0
%rdx	t1

swap:

```
movq    (%rdi), %rax    # t0 = *xp
movq    (%rsi), %rdx    # t1 = *yp
movq    %rdx, (%rdi)   # *xp = t1
movq    %rax, (%rsi)   # *yp = t0
ret
```

# Understanding Swap()

## Registers

<code>%rdi</code>	<code>0x120</code>
<code>%rsi</code>	<code>0x100</code>
<code>%rax</code>	
<code>%rdx</code>	

## Memory

	Address
123	<code>0x120</code>
	<code>0x118</code>
	<code>0x110</code>
	<code>0x108</code>
456	<code>0x100</code>

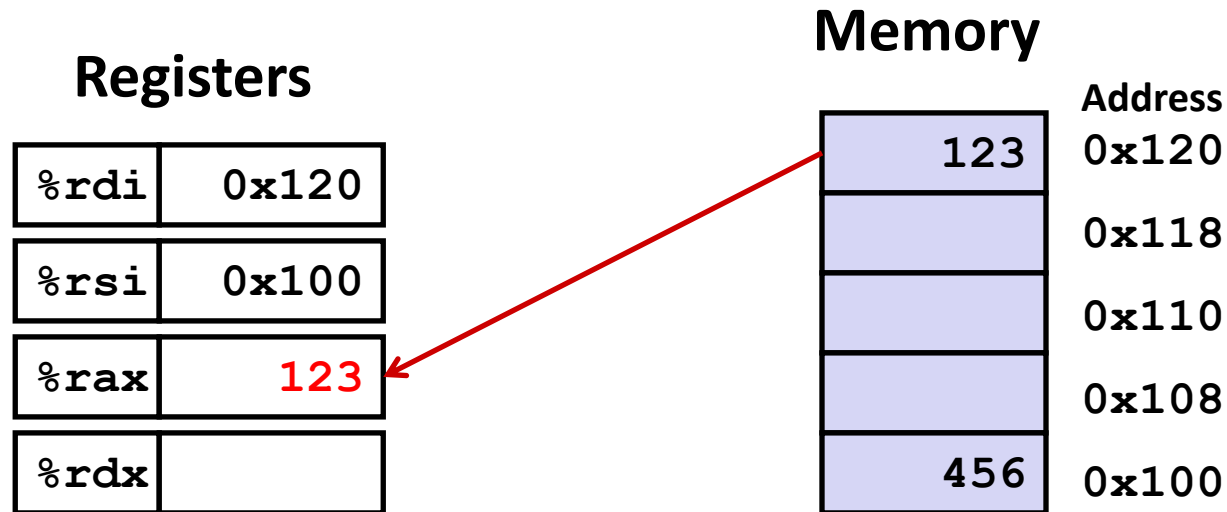
`swap:`

```

movq    (%rdi), %rax    # t0 = *xp
movq    (%rsi), %rdx    # t1 = *yp
movq    %rdx, (%rdi)    # *xp = t1
movq    %rax, (%rsi)    # *yp = t0
ret

```

# Understanding Swap()



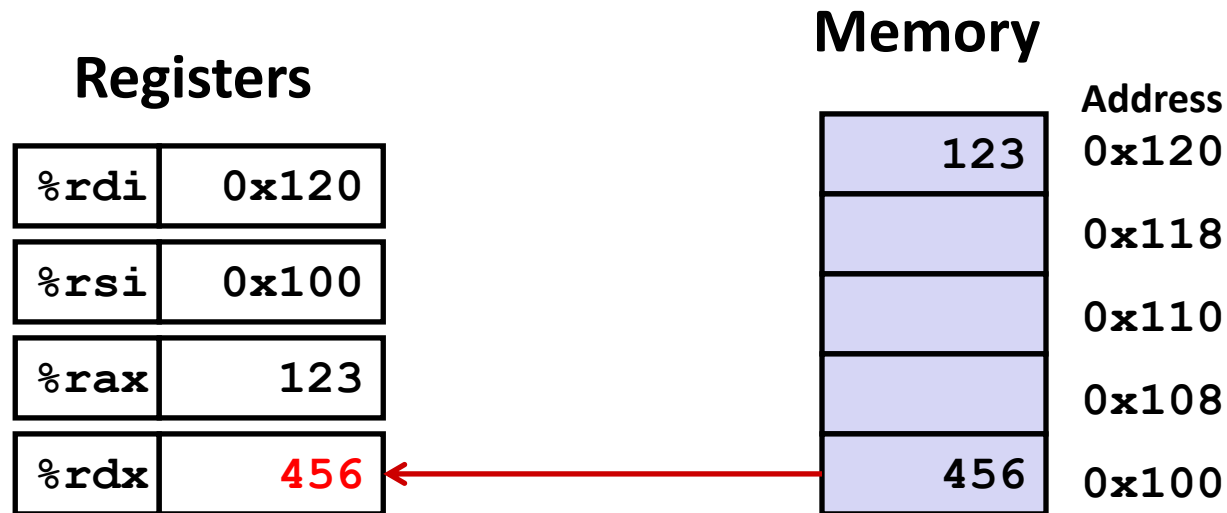
**swap:**

```

movq    (%rdi), %rax    # t0 = *xp
movq     (%rsi), %rdx    # t1 = *yp
movq     %rdx, (%rdi)    # *xp = t1
movq     %rax, (%rsi)    # *yp = t0
ret

```

# Understanding Swap()



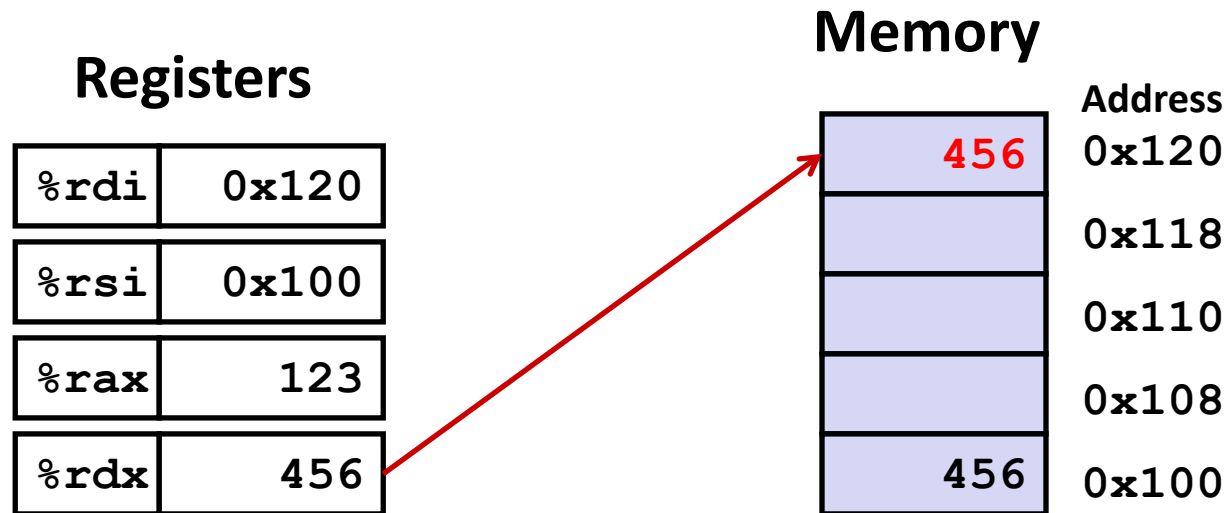
swap:

```

movq    (%rdi), %rax    # t0 = *xp
movq    (%rsi), %rdx    # t1 = *yp
movq    %rdx, (%rdi)    # *xp = t1
movq    %rax, (%rsi)    # *yp = t0
ret

```

# Understanding Swap()



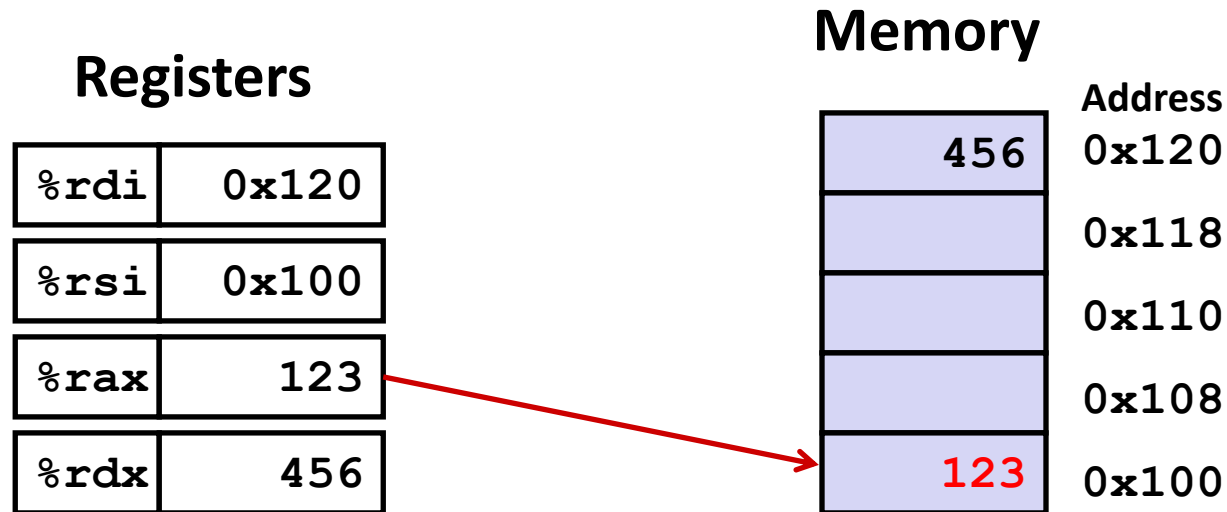
**swap:**

```

movq    (%rdi), %rax    # t0 = *xp
movq    (%rsi), %rdx    # t1 = *yp
movq    %rdx, (%rdi)    # *xp = t1
movq    %rax, (%rsi)    # *yp = t0
ret

```

# Understanding Swap()



**swap:**

```

movq    (%rdi), %rax    # t0 = *xp
movq    (%rsi), %rdx    # t1 = *yp
movq    %rdx, (%rdi)    # *xp = t1
movq   %rax, (%rsi)    # *yp = t0
ret

```