Functions

Instruction manuals for computers

Paul Solt
iPhoneDev.tv

Outline

- Functions
- Stack Frame
- Recursion
- Debugging
- Global Variables

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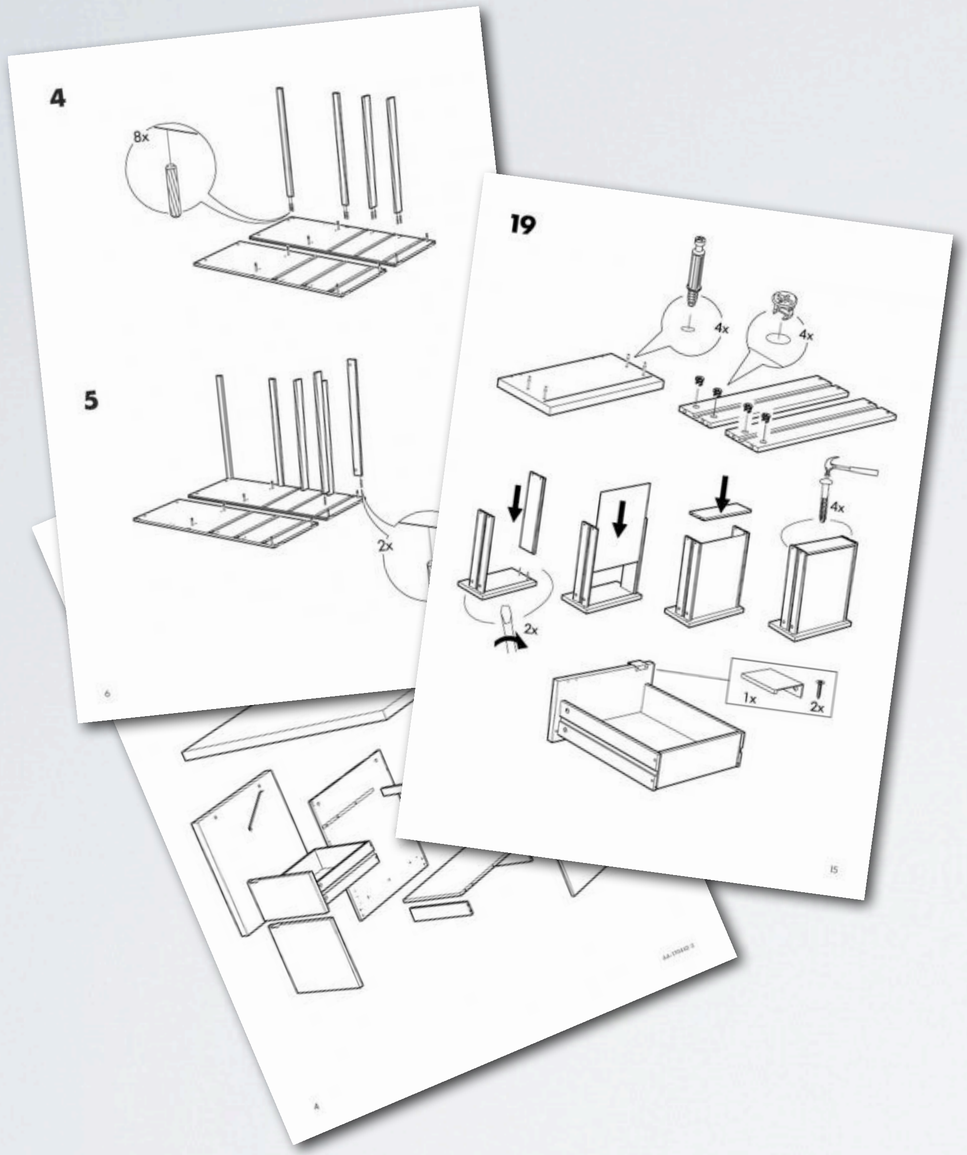
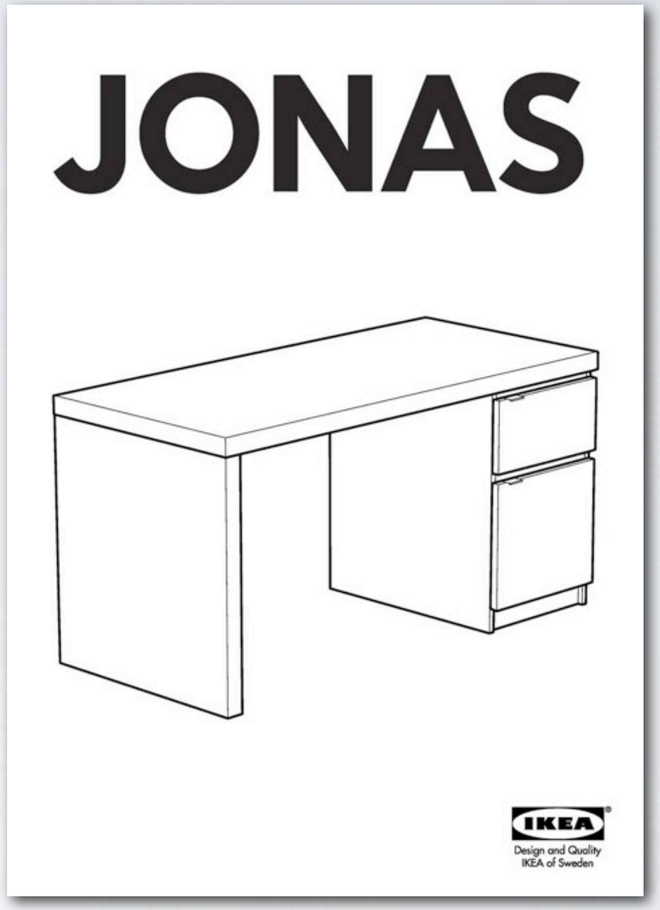

4
8x
5
2x
19
4x
4x
4x
2x
1x
2x


JONAS
IKEA
Design and Quality
IKEA of Sweden

Desk

1. Build small drawer
2. Build large drawer
3. Build desk frame
4. Insert small drawer
5. Insert large drawer

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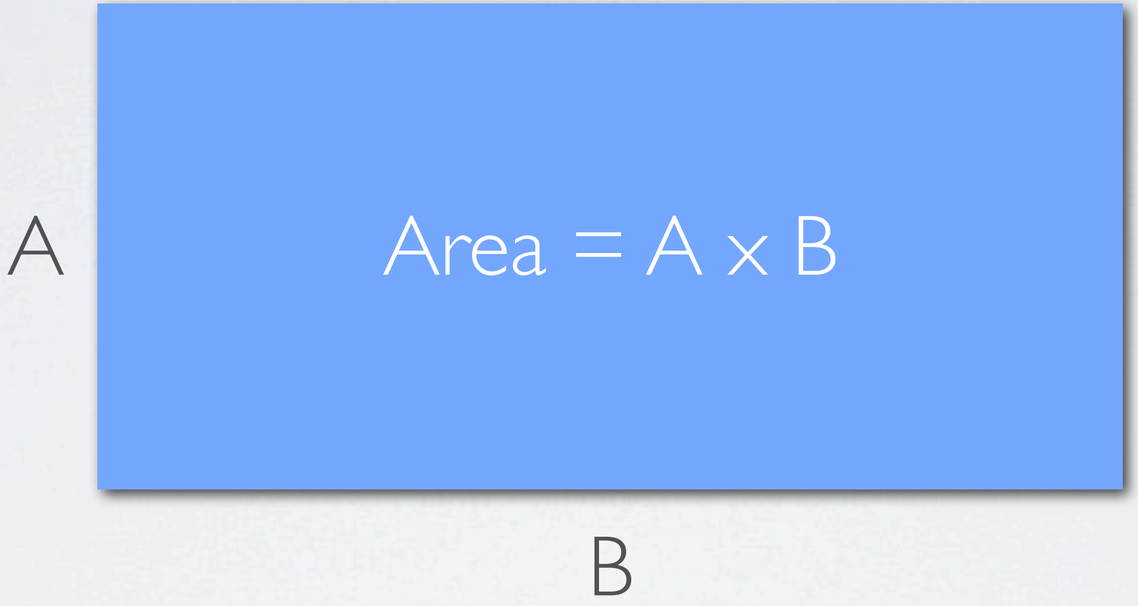
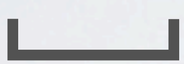
Area



```
int area(int sideA, int sideB)
```

```
int area(int sideA, int sideB)
```

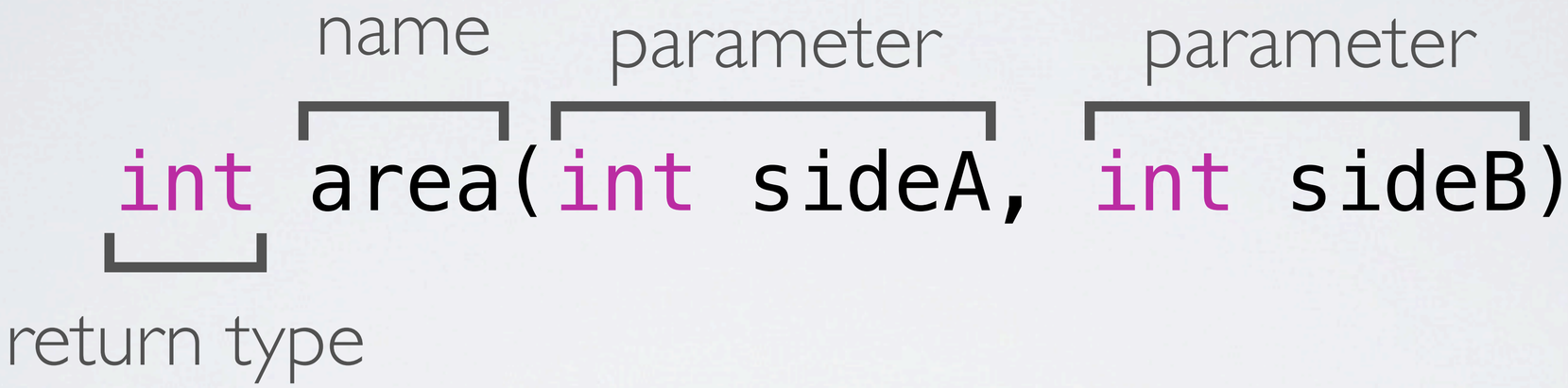


return type

name

```
int area(int sideA, int sideB)
```

return type


name
parameter
parameter
int area(int sideA, int sideB)
return type

```
int area(int sideA, int sideB)
```

```
int area(int sideA, int sideB)
{
    int result = sideA * sideB;
    return result;
}
```

```
int total = area(4, 2);
```

arguments

```
int total = area(4, 2);
```

arguments

```
int total = area(4, 2);
```

8

```
int total = area(4, 2);
```

Stack Frame

- "Sandbox"
- Local Variables

Stack Frame

```
main()
total = area(4,2);
```

- "Sandbox"
- Local Variables

Stack Frame

- "Sandbox"
- Local Variables

```
main()
total = area(4,2);
```

```
area(4,2)
sideA = 4
sideB = 2
result = 8
```

Stack Frame

```
main()
total = area(4,2);
```

- "Sandbox"
- Local Variables

Stack Frame

```
main()
total = 8;
```

- "Sandbox"
- Local Variables

Stack Frame

- "Sandbox"
- Local Variables

Area

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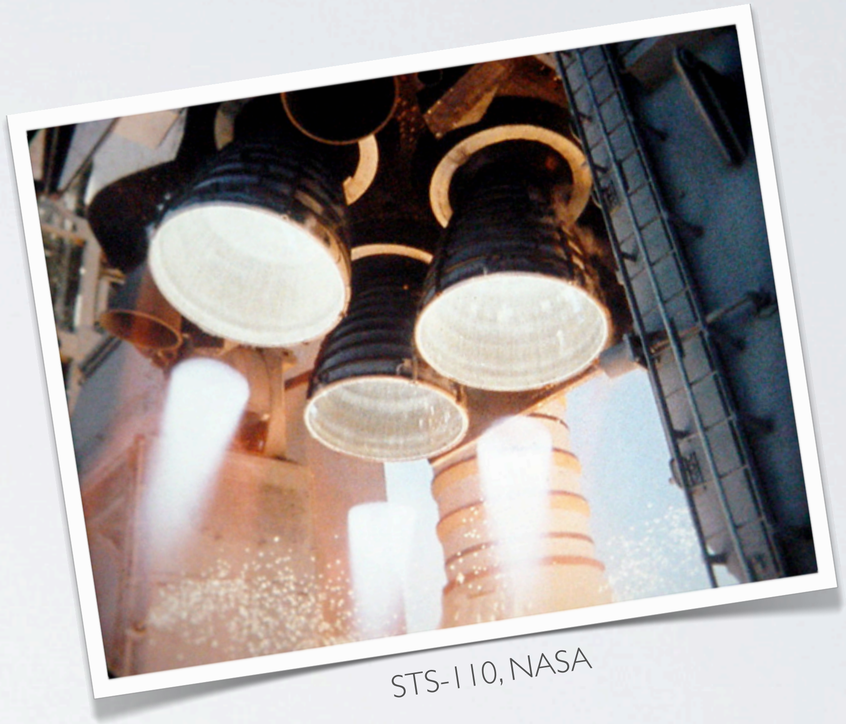
Recursion

Space Shuttle: Countdown Timer

1. Display number
2. Subtract one
3. Repeat steps 1 and 2 (until 0)



STS-110, NASA

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Recursion

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Recursion

```
void countDown(int number) {
    if(number == 0) {
        printf("Take off!\n");
    } else {
        printf("T-minus %d seconds\n", number);
        int nextNumber = number - 1;
        countDown(nextNumber);
    }
}
```

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Recursion

```
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    if(number == 0) {
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    } else {
        printf("T-minus %d seconds\n", number);
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```

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Recursion

```
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    if(number == 0) {
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    } else {
        printf("T-minus %d seconds\n", number);
        int nextNumber = number - 1;
        countDown(nextNumber);
    }
}
```

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Stack Frame

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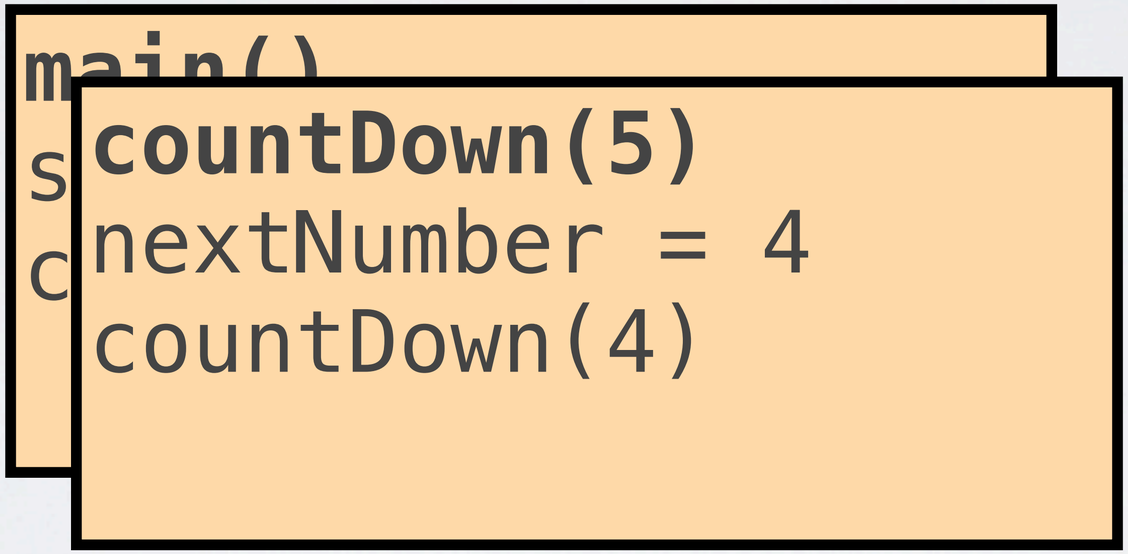
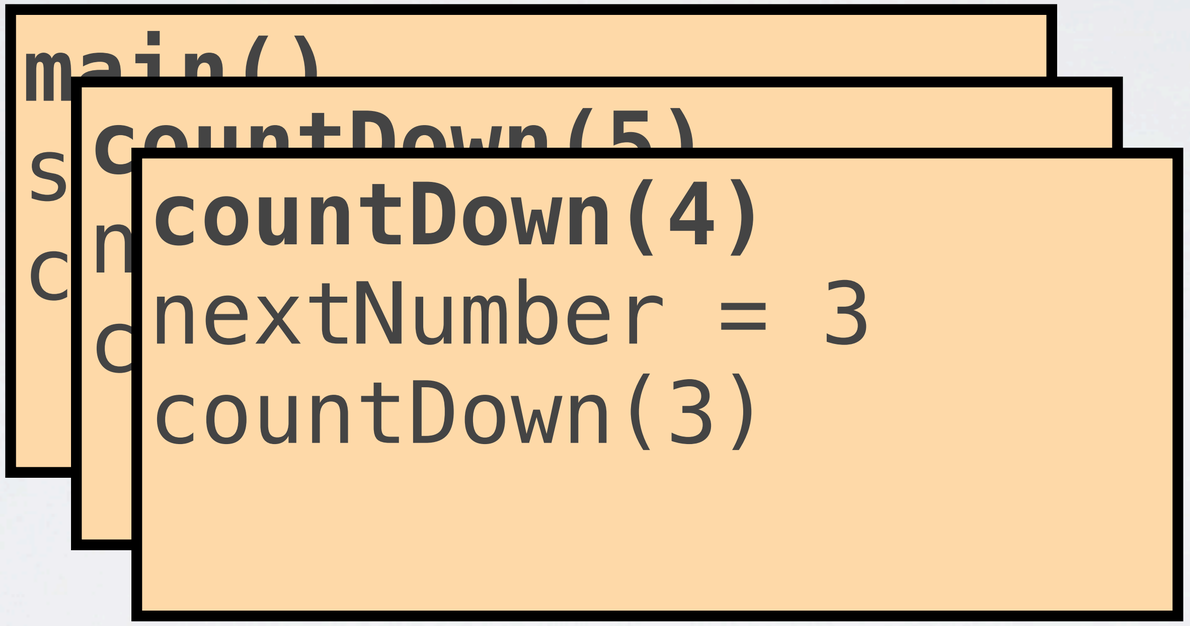
Stack Frame

```
main()
startNumber = 5
countDown(5)
```

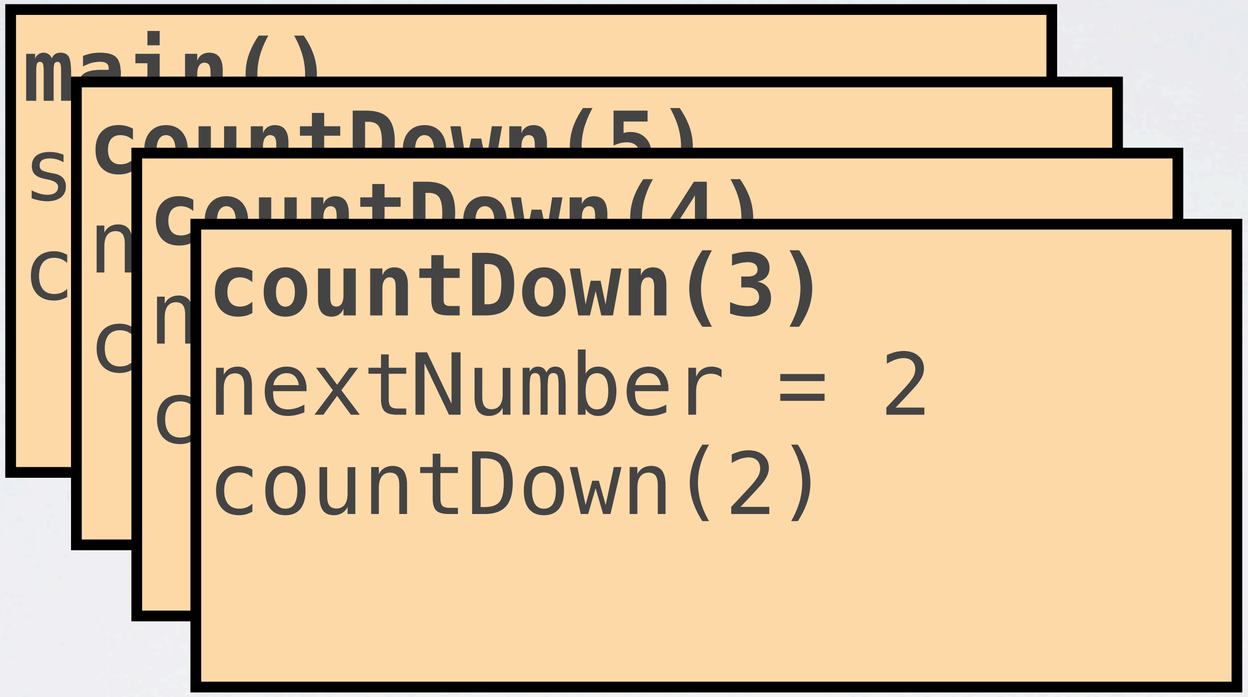
Stack Frame



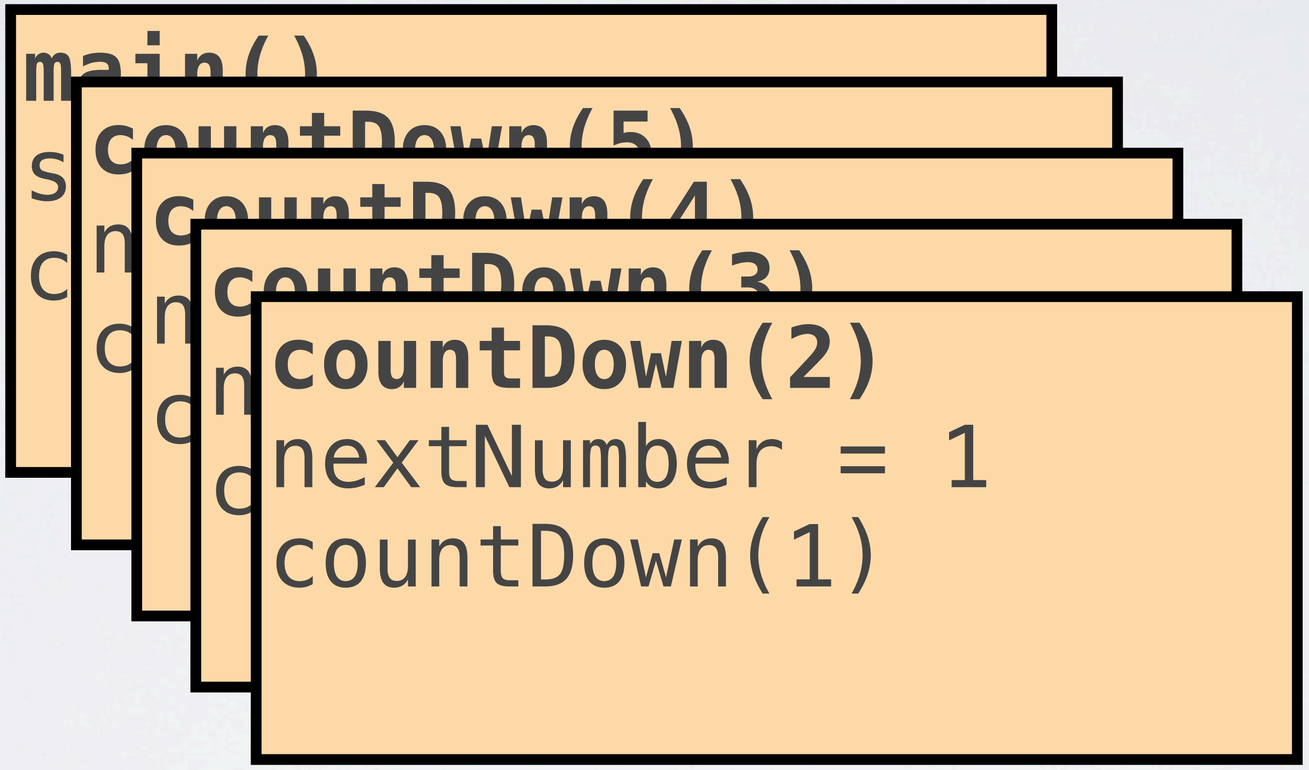
Stack Frame



Stack Frame



Stack Frame



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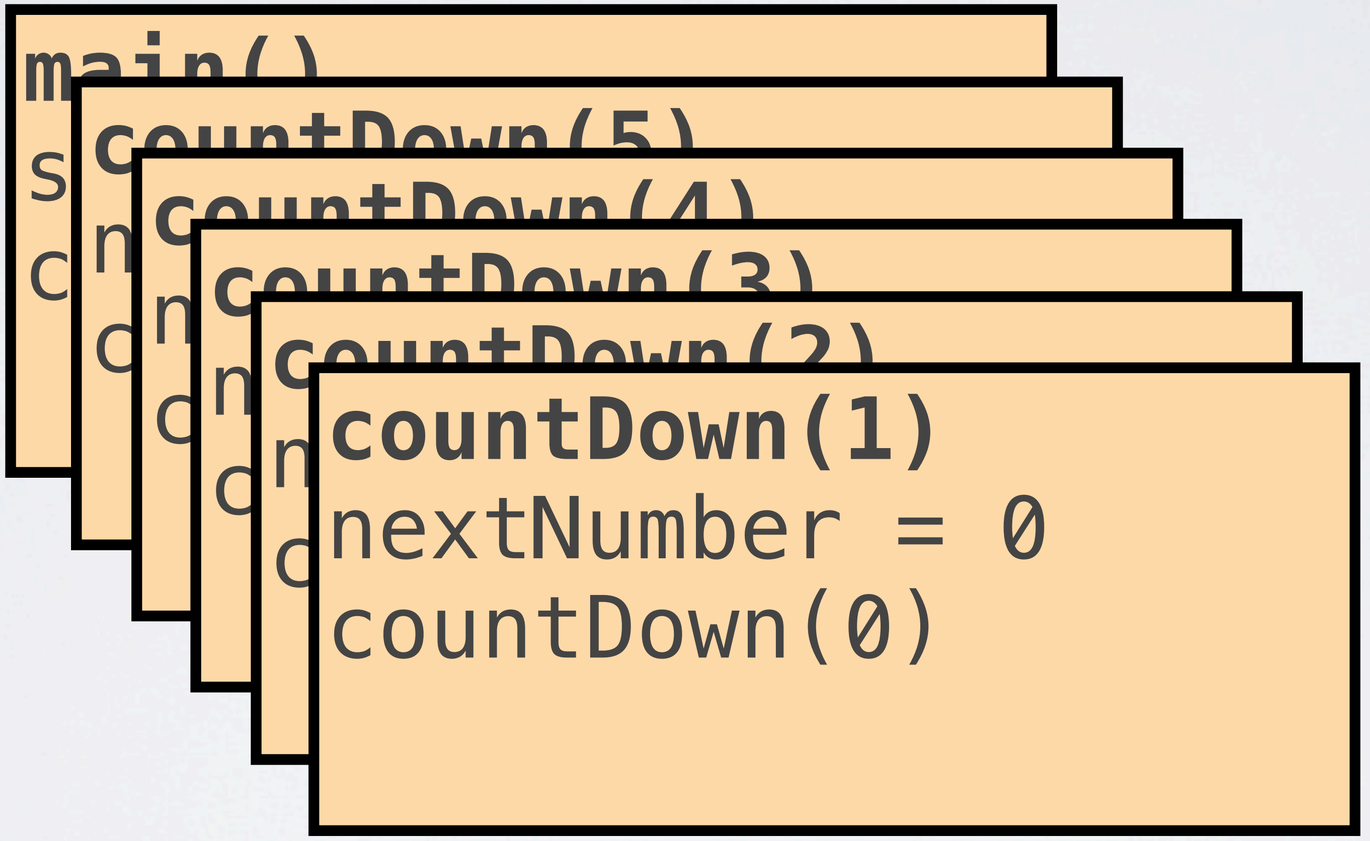
Stack Frame



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Stack Frame

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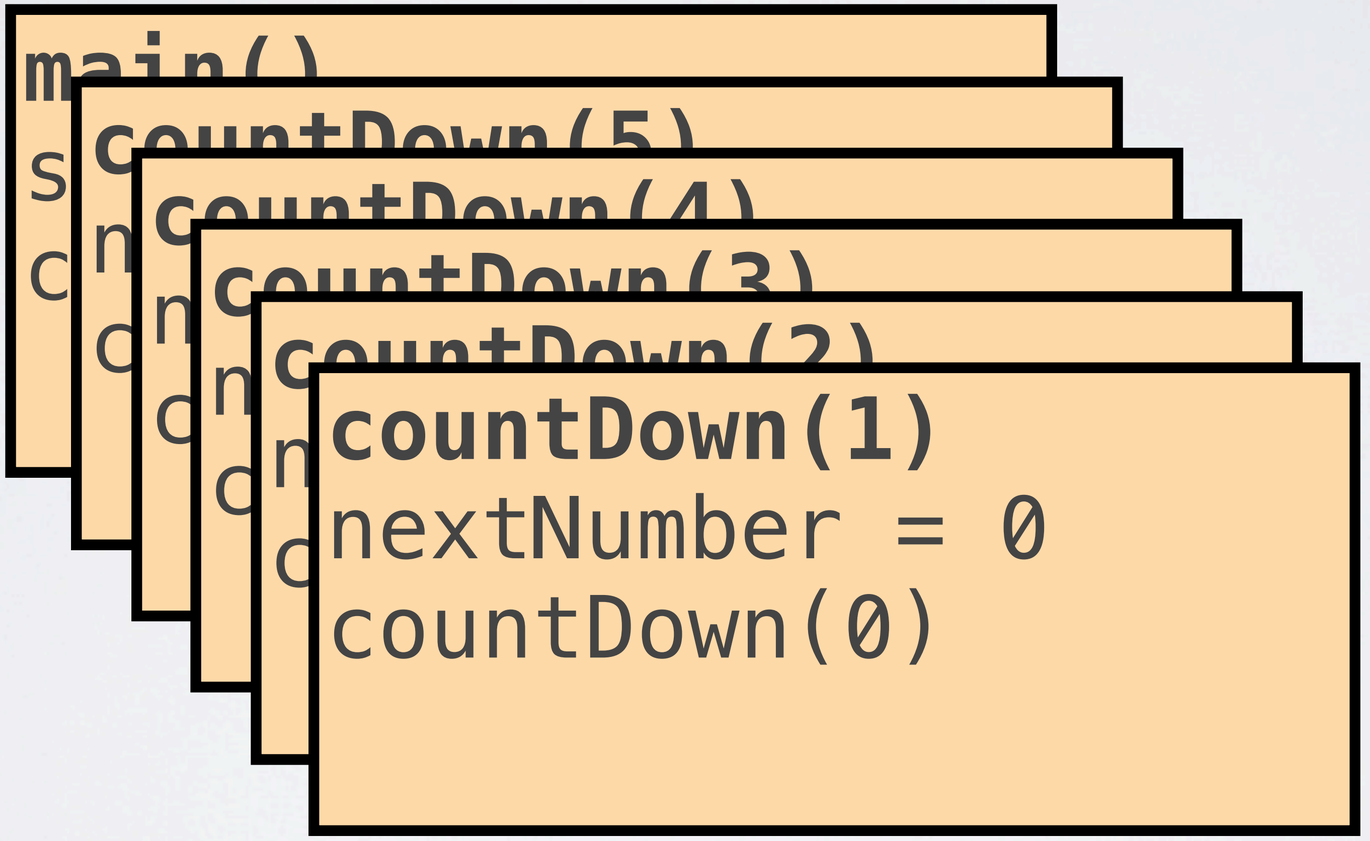
Stack Frame



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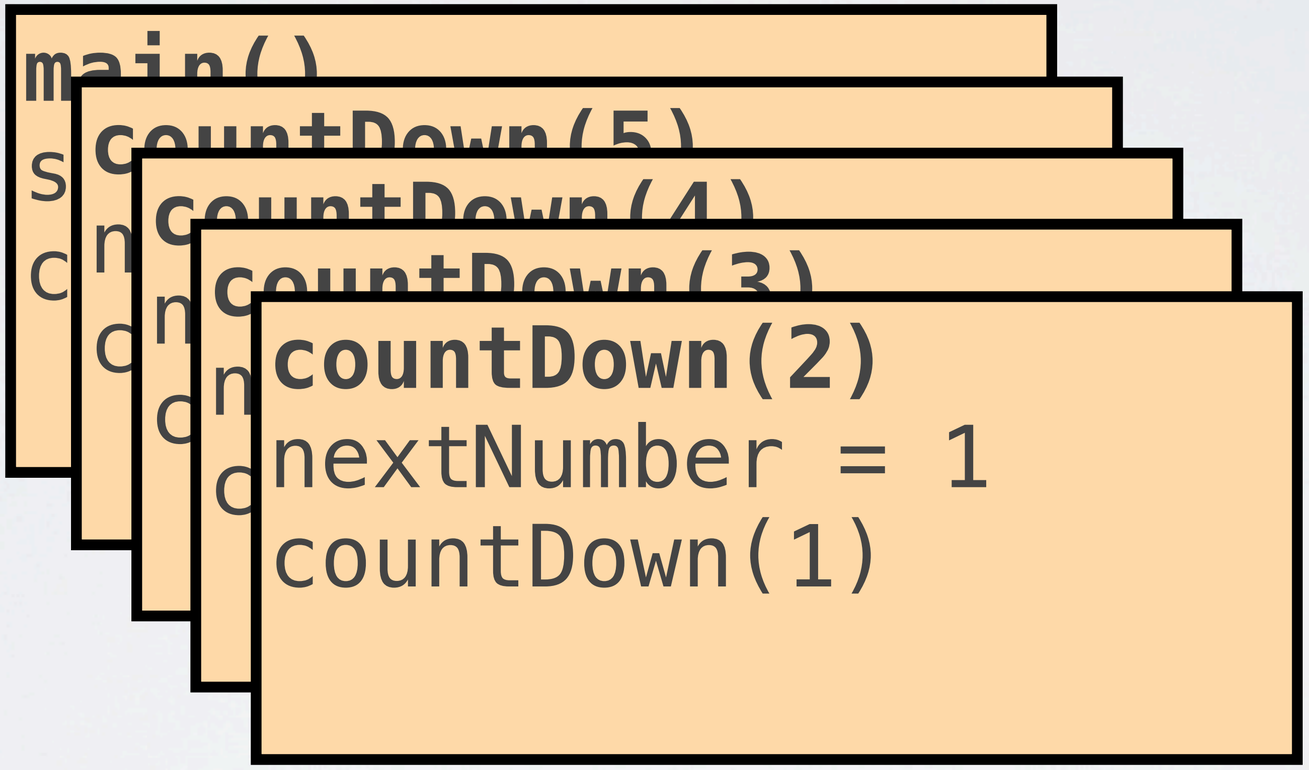
Stack Frame



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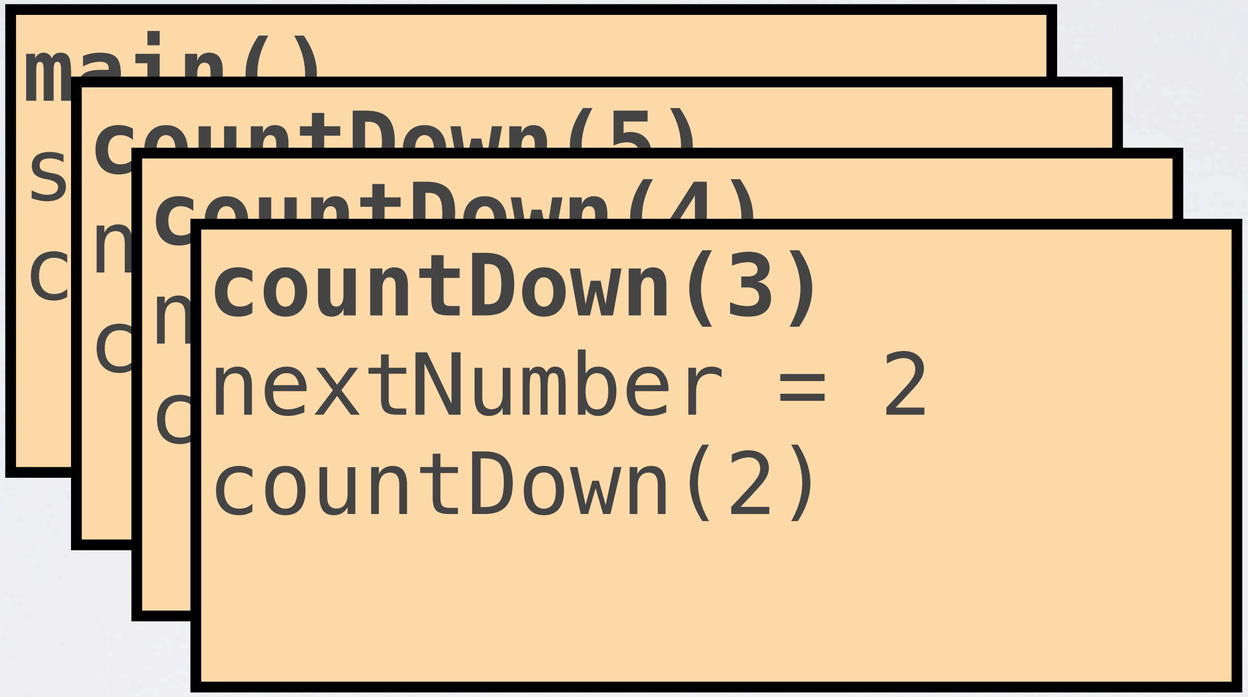
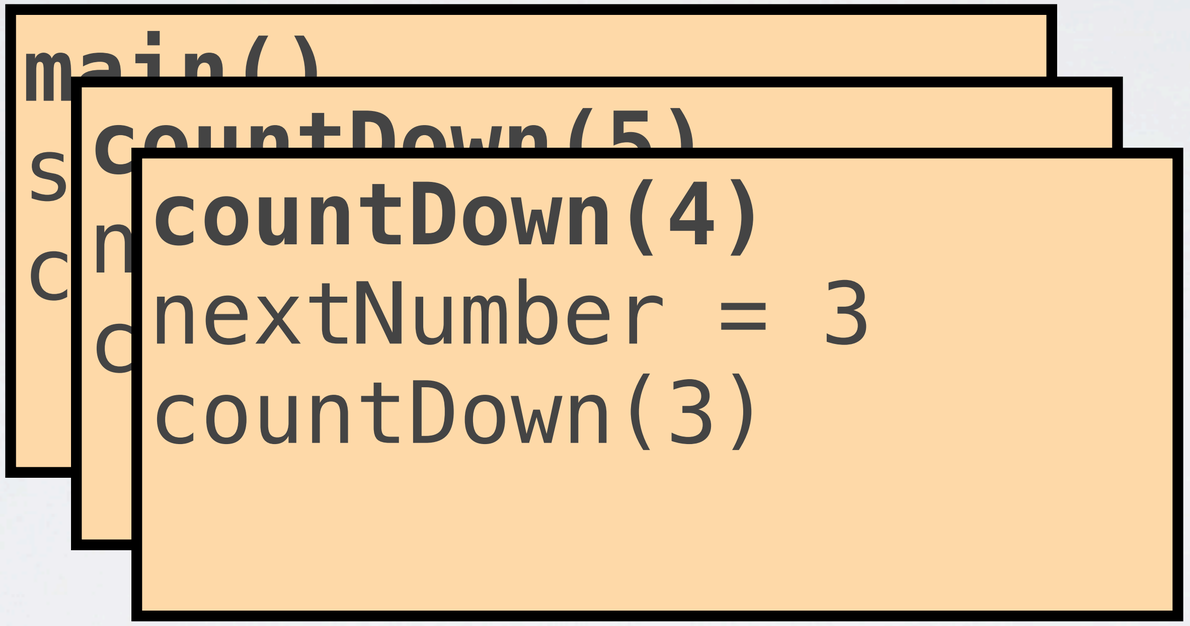
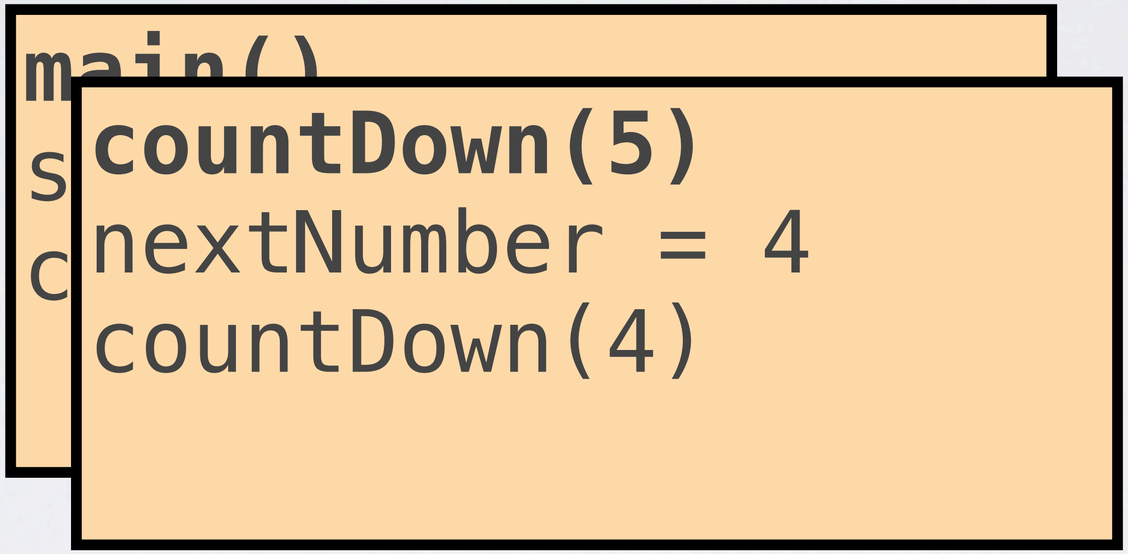
Stack Frame



Stack Frame



Stack Frame



Stack Frame

```
main()
startNumber = 5
countDown(5)
```

Stack Frame

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CountDown!

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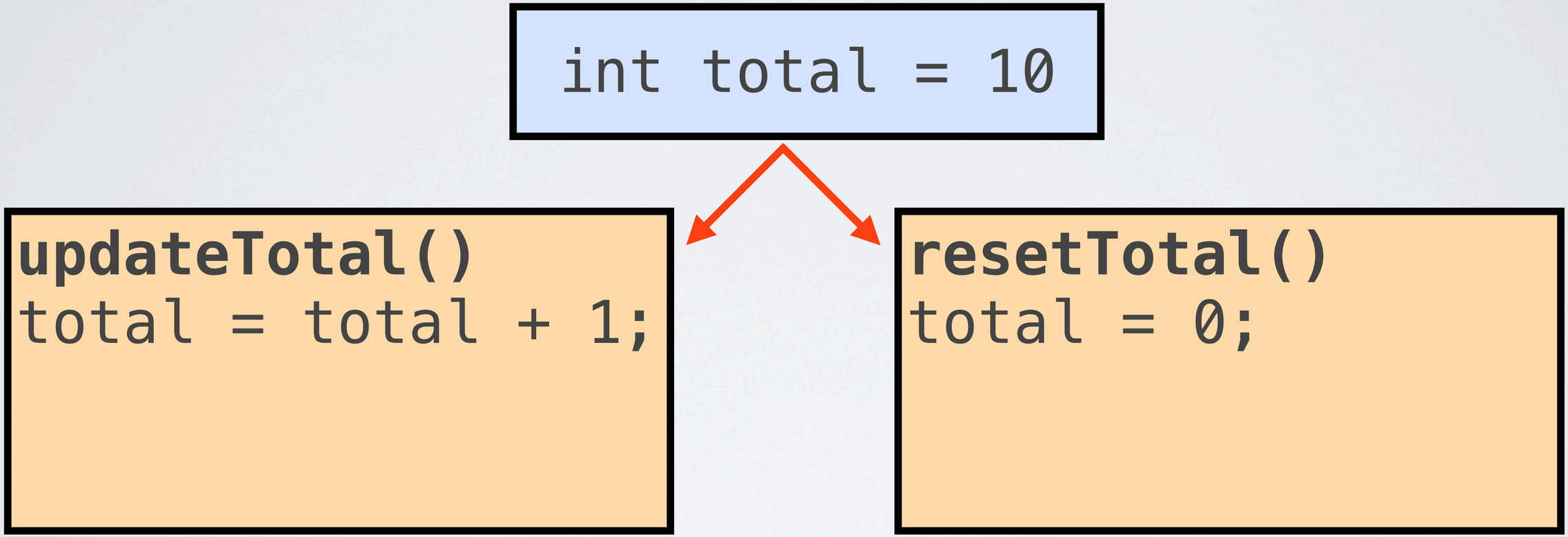
Global Variables



Global Variables

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Review

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- Debugging
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