Exercise 1

Exercise 1

Write a function `swap` that swaps the values of two `int`-variables.

Example:

```
int a = 5;
int b = 6;
// here comes your function call
std::cout << a << "\n"; // outputs 6
std::cout << b << "\n"; // outputs 5
```

(From: Script Exercise 95)

Exercise 1

Solution:

```
// POST: the values of i and j are swapped
void swap (int& i, int& j) {
    const int h = i;
    i = j;
    j = h;
}
```

```
int a = 5;
int b = 6;
swap(a, b);
std::cout << a << "\n"; // outputs 6
std::cout << b << "\n"; // outputs 5
```

(From: Script Exercise 95)

Exercise 1

Solution:

```
// POST: the values of i and j are swapped
void swap (int& i, int& j) {
    const int h = i;
    i = j;
    j = h;
}
```

a: 5

```
int a = 5;
int b = 6;
swap(a, b);
std::cout << a << "\n"; // outputs 6
std::cout << b << "\n"; // outputs 5
```

Exercise 1

Solution:

```
// POST: the values of i and j are swapped
void swap (int& i, int& j) {
    const int h = i;
    i = j;
    j = h;
}
```

```
int a = 5;
int b = 6;
swap(a, b);
std::cout << a << "\n"; // outputs 6
std::cout << b << "\n"; // outputs 5
```

```
a:  5
b:  6
```

Exercise 1

Solution:

```
// POST: the values of i and j are swapped
void swap (int& i, int& j) {
    const int h = i;
    i = j;
    j = h;
}
```

```
int a = 5;
int b = 6;
swap(a, b);
std::cout << a << "\n"; // outputs 6
std::cout << b << "\n"; // outputs 5
```

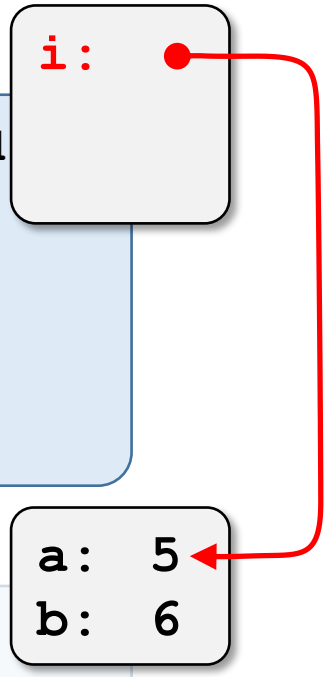
```
a:  5
b:  6
```

(From: Script Exercise 95)

Exercise 1

Solution:

```
// POST: the values of i and j are swapped
void swap (int& i, int& j) {
    const int h = i;
    i = j;
    j = h;
}
```

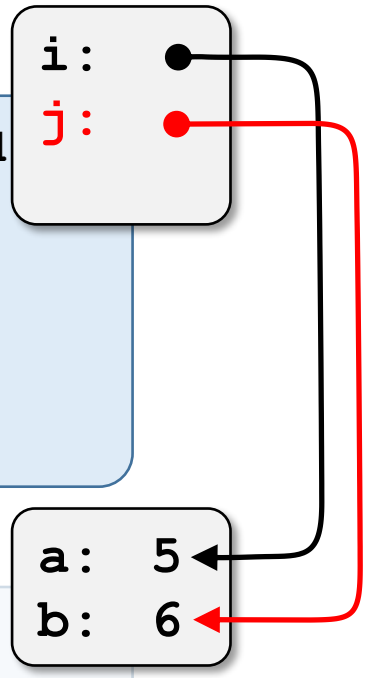



```
int a = 5;
int b = 6;
swap(a, b);
std::cout << a << "\n"; // outputs 6
std::cout << b << "\n"; // outputs 5
```

Exercise 1

Solution:

```
// POST: the values of i and j are swapped
void swap (int& i, int& j) {
    const int h = i;
    i = j;
    j = h;
}
```



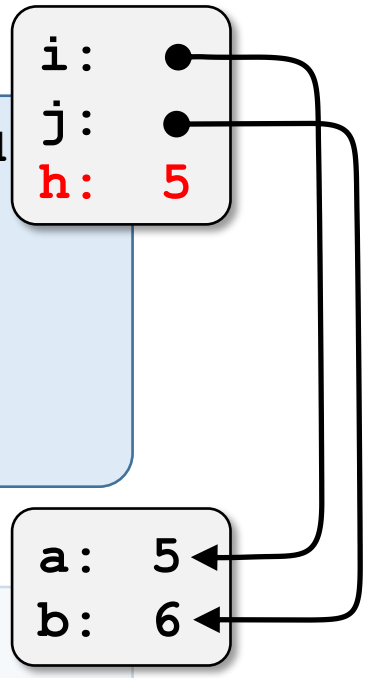

```
int a = 5;
int b = 6;
swap(a, b);
std::cout << a << "\n"; // outputs 6
std::cout << b << "\n"; // outputs 5
```

(From: Script Exercise 95)

Exercise 1

Solution:

```
// POST: the values of i and j are swapped
void swap (int& i, int& j) {
    const int h = i;
    i = j;
    j = h;
}
```

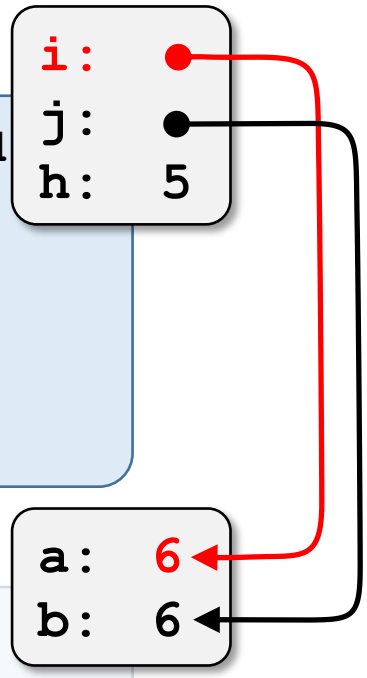



```
int a = 5;
int b = 6;
swap(a, b);
std::cout << a << "\n"; // outputs 6
std::cout << b << "\n"; // outputs 5
```

Exercise 1

Solution:

```
// POST: the values of i and j are swapped
void swap (int& i, int& j) {
    const int h = i;
    i = j;
    j = h;
}
```



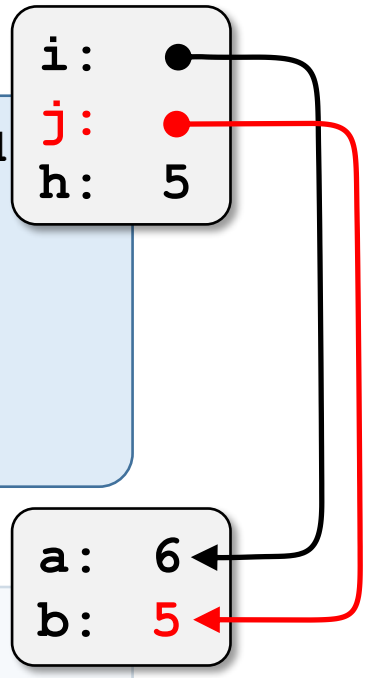

```
int a = 5;
int b = 6;
swap(a, b);
std::cout << a << "\n"; // outputs 6
std::cout << b << "\n"; // outputs 5
```

(From: Script Exercise 95)

Exercise 1

Solution:

```
// POST: the values of i and j are swapped
void swap (int& i, int& j) {
    const int h = i;
    i = j;
    j = h;
}
```




```
int a = 5;
int b = 6;
swap(a, b);
std::cout << a << "\n"; // outputs 6
std::cout << b << "\n"; // outputs 5
```

(From: Script Exercise 95)

Exercise 1

Solution:

```
// POST: the values of i and j are swapped
void swap (int& i, int& j) {
    const int h = i;
    i = j;
    j = h;
}
```

```
int a = 5;
int b = 6;
swap(a, b);
std::cout << a << "\n"; // outputs 6
std::cout << b << "\n"; // outputs 5
```

```
a:  6
b:  5
```

(From: Script Exercise 95)

Exercise 1

Solution:

```
// POST: the values of i and j are swapped
void swap (int& i, int& j) {
    const int h = i;
    i = j;
    j = h;
}
```

```
int a = 5;
int b = 6;
swap(a, b);
std::cout << a << "\n"; // outputs 6
std::cout << b << "\n"; // outputs 5
```

```
a:  6
b:  5
```

Exercise 2

Exercise 2

Find all mistakes (if any) in the following program, and explain why these are mistakes.

```
int foo (int& k) {
    return k += 2;
}
```

```
int main () {
    const int i = 5;
    int& j = foo(i);
    return 0;
}
```

(From: Script Exercise 97)

Exercise 2

```
int foo (int& k) {
    return k += 2;
}
```

Problem 1:

`i` is `const`, but `k` is non-`const` reference.

```
int main () {
    const int i = 5;
    int& j = foo(i);
    return 0;
}
```

(From: Script Exercise 97)

Exercise 2

```
int foo (int& k) {
    return k += 2;
}
```

Problem 1:

`i` is `const`, but `k` is non-`const` reference.

```
int main () {
    const int i = 5;
    int& j = foo(i);
    return 0;
}
```

Problem 2:

`j` is non-`const` reference, but `foo` returns an rvalue.

(From: Script Exercise 97)

Exercise 2

Find all mistakes (if any) in the following program, and explain why these are mistakes.

```
int foo (int& k) {
    return k += 2;
}
```

```
int main () {
    int i = 5;
    const int& j = foo(i);
    return 0;
}
```

(From: Script Exercise 97)

Exercise 2

```
int foo (int& k) {
    return k += 2;
}
```

```
int main () {
    int i = 5;
    const int& j = foo(i);
    return 0;
}
```

(From: Script Exercise 97)

Exercise 2

Find all mistakes (if any) in the following program, and explain why these are mistakes.

```
int foo (int& k) {
    return k += 2;
}

const int& bar (int &m) {
    return m += 2;
}
```

```
int main () {
    int i = 5;
    const int& j = bar(foo(i));
    return 0;
}
```

(From: Script Exercise 97)

Exercise 2

```
int foo (int& k) {
    return k += 2;
}

const int& bar (int &m) {
    return m += 2;
}
```

Problem:

Initialization of a reference from an rvalue.

```
int main () {
    int i = 5;
    const int& j = bar(foo(i));
    return 0;
}
```

(From: Script Exercise 97)

Exercise 2

Find all mistakes (if any) in the following program, and explain why these are mistakes.

```
int foo (int& k) {
    return k += 2;
}

const int& bar (int &m) {
    return m += 2;
}
```

```
int main () {
    int i = 5;
    const int& j = foo(bar(i));
    return 0;
}
```

(From: Script Exercise 97)

Exercise 2

```
int foo (int& k) {
    return k += 2;
}

const int& bar (int &m) {
    return m += 2;
}
```

Problem:

Initialization of non-`const` reference from `const` reference.

```
int main () {
    int i = 5;
    const int& j = foo(bar(i));
    return 0;
}
```

(From: Script Exercise 97)

Exercise 2

Find all mistakes (if any) in the following program, and explain why these are mistakes.

```
const int& bar (int &m) {
    return m += 2;
}
```

```
int main () {
    int i = 5;
    const int j = bar(++i);
    return 0;
}
```

(From: Script Exercise 97)

Exercise 2

```
int foo (int& k) {
    return k += 2;
}

const int& bar (int &m) {
    return m += 2;
}
```

```
int main () {
    int i = 5;
    const int j = bar(++i);
    return 0;
}
```

(From: Script Exercise 97)