

# How's your midterm project?

not bad

finished my part

eh

surviving

it's getting there

pretty much done

going smoothly

# Today's plan

- Review ex 8-2
- Recap content
- In-class ex 9-1

## Ex 8-2

- Practiced how to use `std::map`
- Practiced how to use `std::sort`
- Saw how to use `std::chrono` for performance measure



# Ex 8-2: Use **std::map** to store frequency

```
std::map<keyType, int> frequency;
```

Given a key, we can advance the frequency:

```
++frequency[key];
```

If key doesn't exist in the map, it will be inserted with initial value 0.

# Ex 8-2: Traversing `std::map`

```
std::map<keyType, int> frequency;
```

To traverse frequency to print the key and value, we use `const_iterator`:

```
for (std::map<keyType, int>::const_iterator  
    it = frequency.cbegin(); it !=  
    frequency.cend(); ++it) {...}
```

To access the key and value in a map with an iterator `it`, we use:

```
it->first and it->second
```



## Ex 8-2: frequency to data map

With the help of `std::vector`, we can store multiple values for a key:

```
std::map<int, std::vector<T> > m;
```

Then, we can traverse our frequency map using iterator `it`, and store all keys having same frequency into `m` by:

```
m[it->second].push_back(it->first);
```

## Ex 8-2: `std::sort`

By passing two iterators, we can sort STL data container such as `std::vector<T> vec` by:

```
std::sort(vec.begin(), vec.end());
```

What have you found by comparing the performance of your sorting algorithm and `std::sort`?

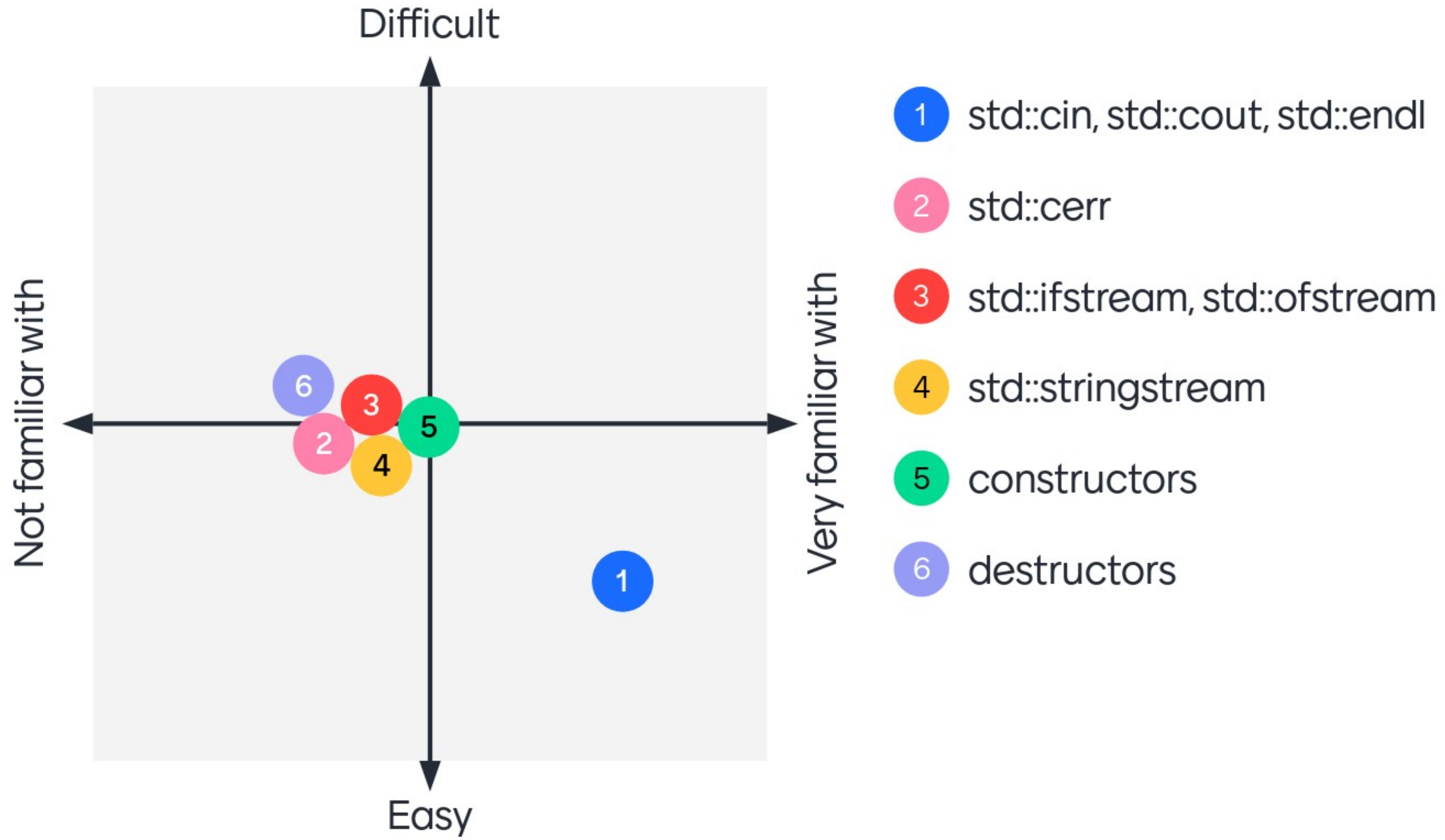
# Some notes on sorting algorithms

- Complexity = number of comparisons
- Fastest comparison sort is  $O(n \log n)$
- It can be linear. Interested?
- Take "Intro to Alg".
- Checkout: <https://www.bigocheatsheet.com/>

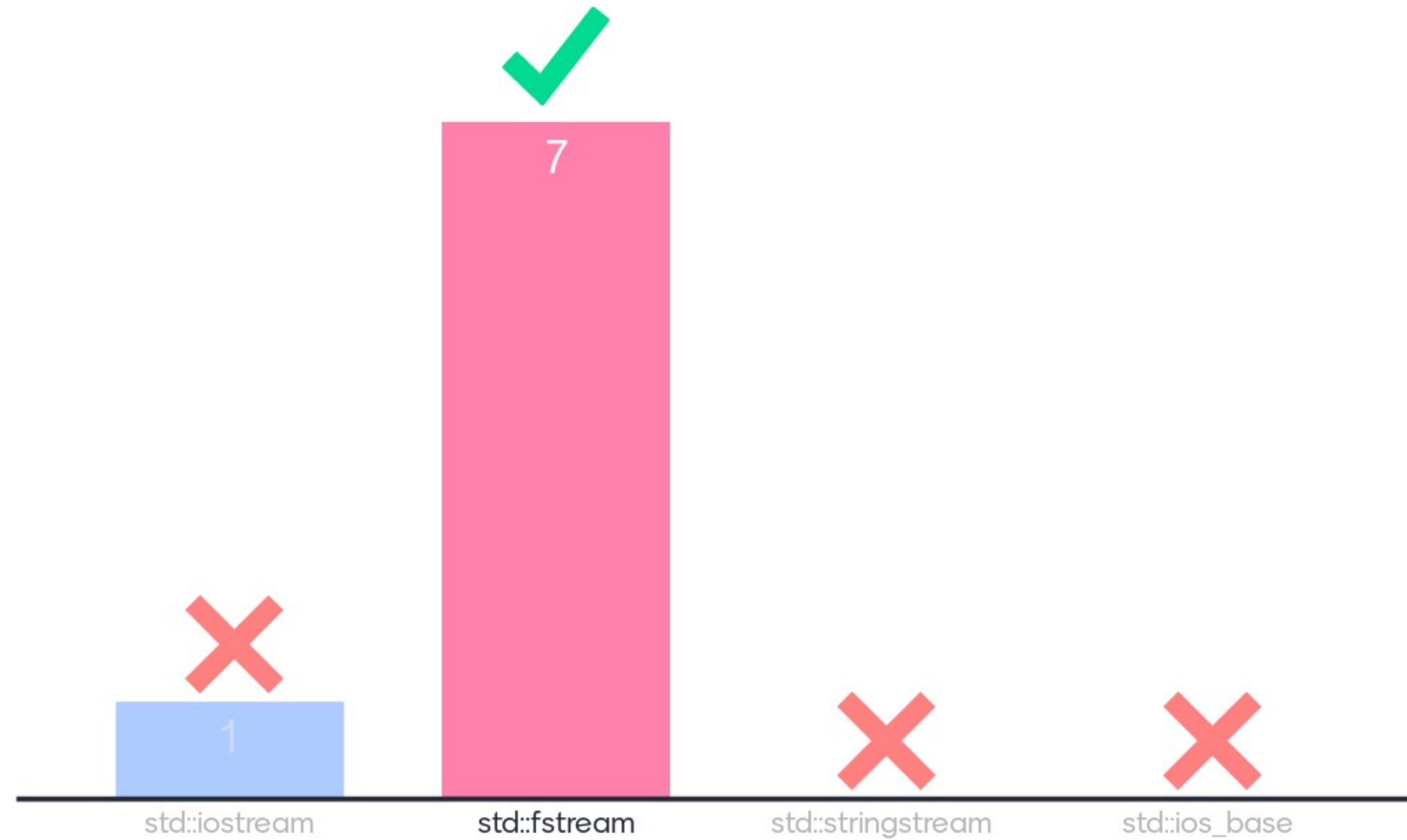




# Do you know these topics?



# Which should be used to read/write files in C++?



# What is a **stringstream** in C++?

a string buffer to operate on strings



for processing to string buffer



a buffer/string we can print to and read from



A way to operate on strings



Io for interacting with strings and formatting them



stream class to work with strings.  
uses seq of char



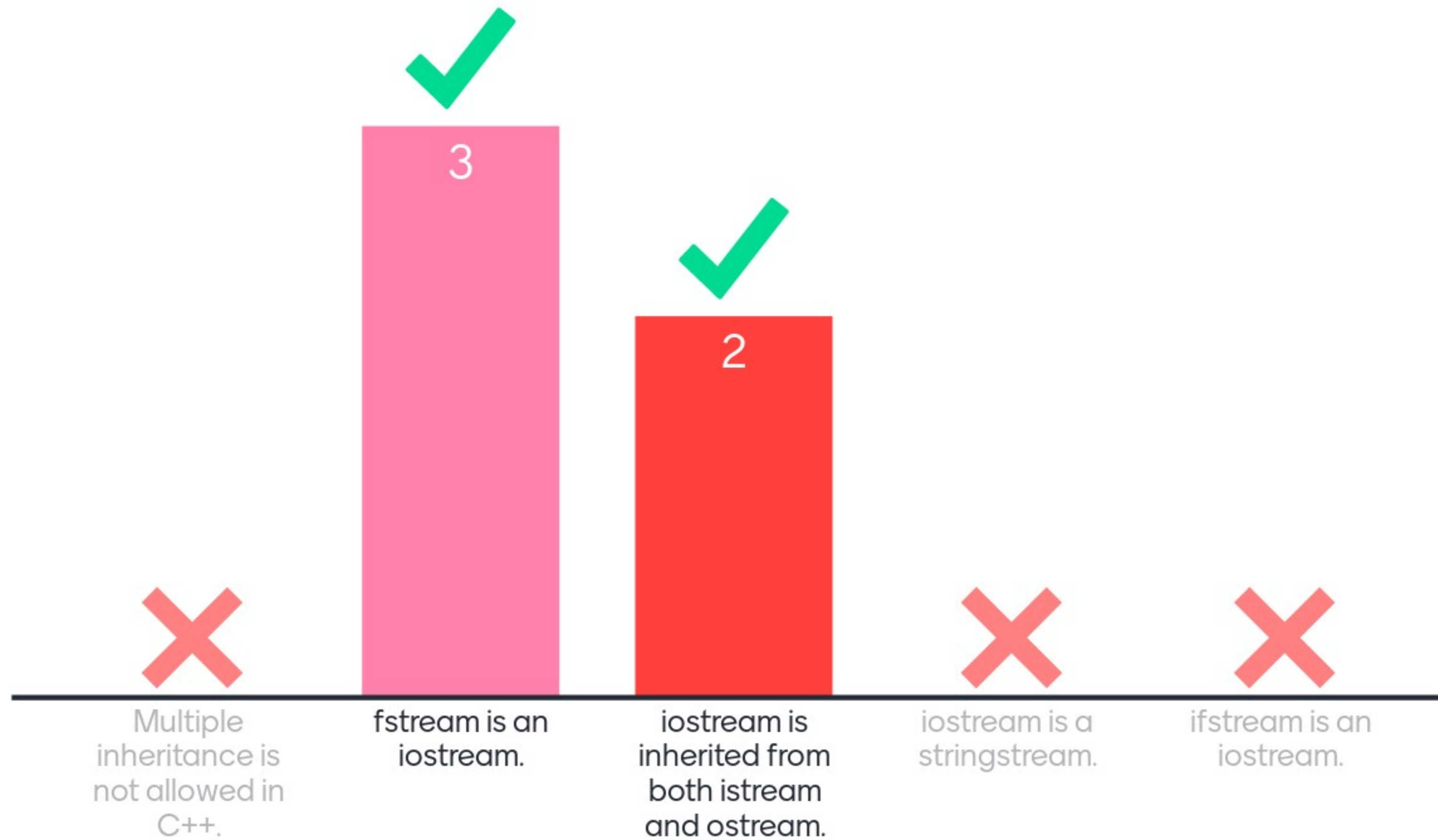
string with a buffer



The correct answer is: A stream that uses string as its buffer. That means we can <</>> into/from a string using stringstream.



# Which of the following is correct?



# What does a constructor do?

to give initial value to variables in a class



initialize fields when instantiating an object



initialize an object



initialize an instance of a class with values



creates instance of that class



initializes the class



The correct answer is: It initializes a class object.

# What does a destructor do?

to autofree the memory when the lifetime of an instance of a class ends



release the memory allocated by constructor



takes care of garbage collection, and deallocating memory.



closes the stream object



The correct answer is: It is called when an object is destroyed to perform a clean-up.



# Ask me anything

0 questions

0 upvotes