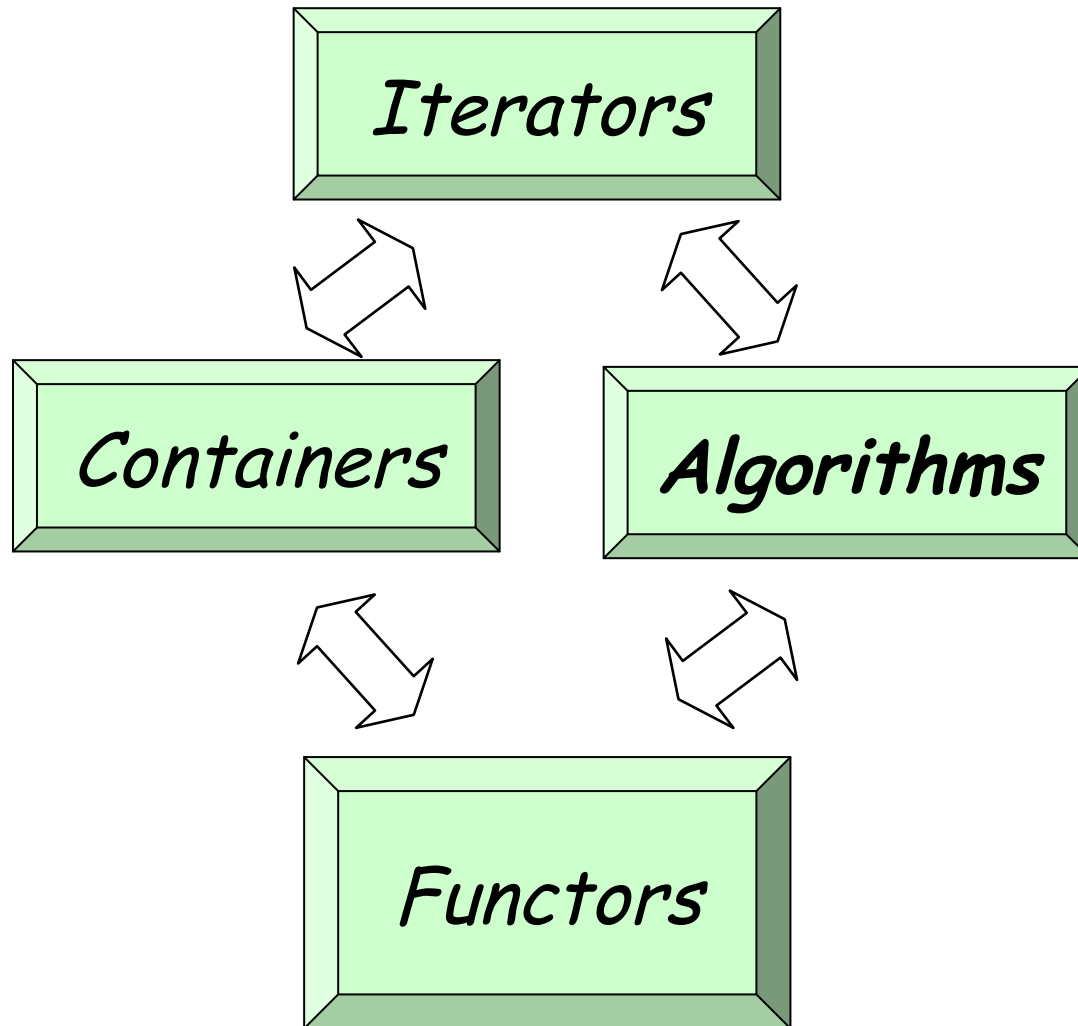


The Standard C++ Library – Algorithms

Based on: Jonathan Boccara,
"105 algorithms in less than an hour",
CPPCON 2018,
<https://youtu.be/2olsGf6JlKU>

Summarized by: Erel Segal-Halevi

Main Components of STL



Algorithms

- In C++17, there are 105 algorithms that perform common programming tasks.
- We need to know them all.
- *Why?* - otherwise, we will try to implement them ourselves as part of larger projects, and:
 - Make bugs (no time to test..),
 - Produce inefficient code (no time to optimize..)
- *How can we remember them?* - use a map →



PROVINCE OF
VALUE
QUERIES

PROVINCE OF
PROPERTY
QUERIES

PROVINCE OF
2-RANGES PROPERTIES

GLORIOUS COUNTY OF
ALGOS ON SETS

LONELY ISLANDS

LANDS OF
QUERIES

PERINSULA OF
RAW MEMORY

TERRITORY OF
MOVERS

PROVINCE OF
RESEARCH

ISLAND OF
STRUCTURE
CHANGERS

LAND OF
VALUE
MODIFIERS

LANDS OF
PERMUTATIONS

THE WORLD
OF
C++ STL
ALGORITHMS
FLUENT C++

Fluent C++
fluentcpp.com

<https://youtu.be/2olsGf6JlKU?t=475>

Queries (10)

Algorithms that calculate a value related to the collection, without modifying it.



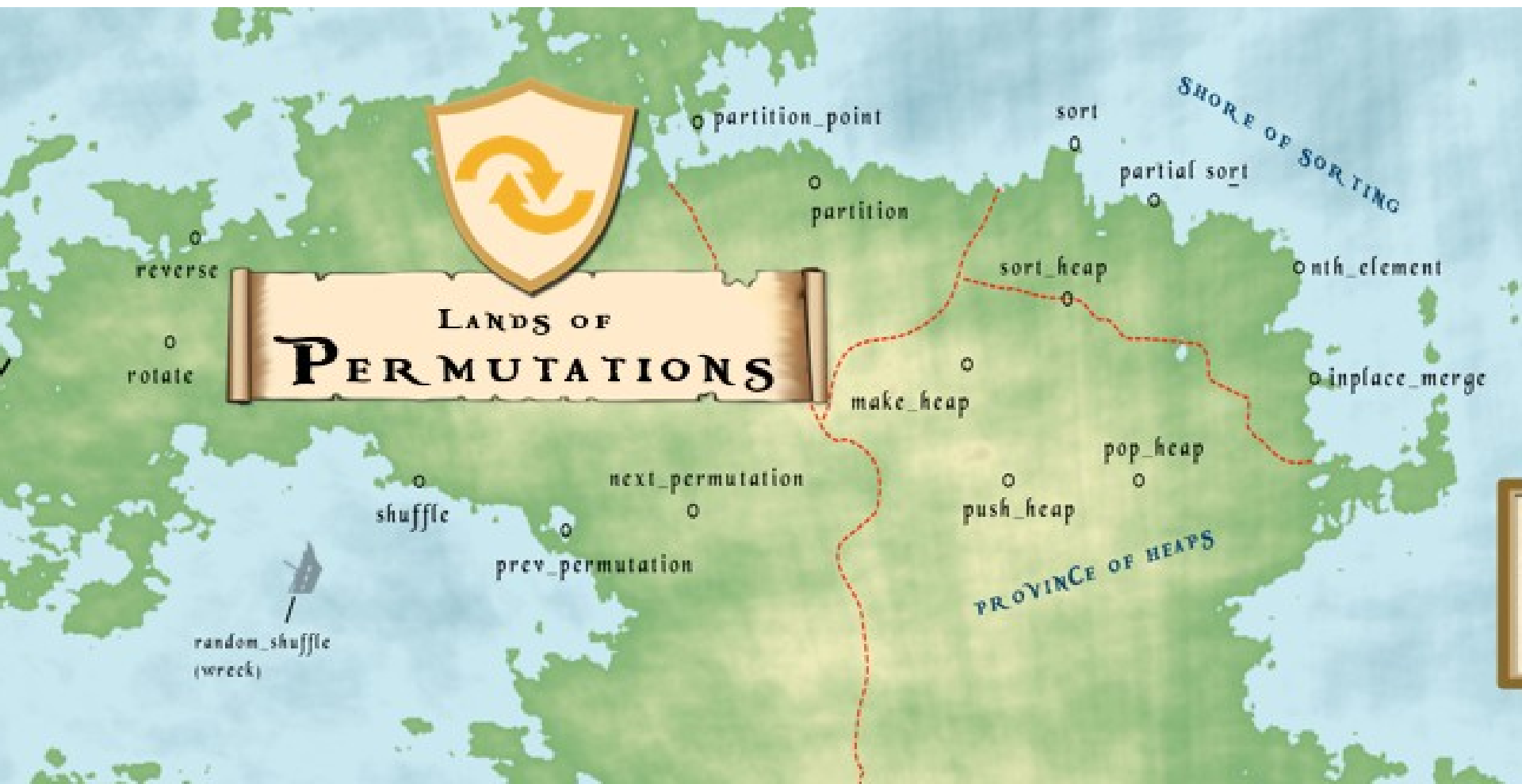
Set Algorithms (11)

Operations on any sorted collection
(including `std::set` but also sorted vectors)



Permutations (12)

Algorithms that move elements around the collection, without changing their values:



Movers (13)

Algorithms that copy/move things between collections.



Value modifiers (14)

Modify values in a collection.



Runes (15)

Words you can add to an algorithm to get a new algorithm:



Structure changers (16)

STL algorithms
work on iterators,
so they cannot
change the size!

Solution: move the
remaining elements
to the *beginning* of
the collection, and
return an iterator to
the *new end*.



Others (17)



What now?

- Use algorithms instead of loops.
- Read the documentation: preconditions, postconditions, complexity
- Invent your own algorithms!

