

Overview of Generic Algorithms Solutions

- Describe a typical generic algorithm function in terms of:
 - The arguments it takes
 - An iterator range, specifying the container elements to process
 - The processing it does
 - Iterates over the elements in the range and calls a function on them
 - The value it returns
 - An iterator which has some property

- Write a simple program that uses a generic algorithm function to find a character in a `std::string` instance
- Print out
 - The search character (if found)
 - The string up to the first occurrence of the search character
 - The rest of the string following the first occurrence

- What happens if the search character is not found?
 - The search character (if found)
 - Do not print this if not found
 - The string up to the first occurrence of the search character
 - Prints the entire string
 - The rest of the string following the first occurrence
 - Prints nothing

- Describe how the `std::find()` algorithm works
 - Iterates over the given iterator range (up to but not including the last element in the range)
 - Compares each element to the search character
 - If they match, stop and return the iterator
 - If not found when the last element is about to be reached, return the last element's iterator

- What is meant by a predicate function?
 - A predicate function returns only true or false (boolean)
- Why are predicate functions important in the context of algorithms?
 - Many algorithms can be passed a predicate function which is called on every element in the range
- Suggest a way in which we can pass predicate functions to an algorithm
 - Functor (there are others which will be covered later)

- Which operator is used by the `sort()` algorithm to order the elements in a container?
 - The `<` operator of the element type
- Give a brief description of how the `sort()` algorithm works
 - It compares pairs of elements
 - The smaller element is moved towards the front and the larger element is moved towards the back
 - Often implemented as a “quicksort”

- Write a simple program which instantiates a vector with string elements and sorts the elements in alphabetical order
- Alter your program so that it sorts the elements according to their length