

# Set Solutions

- What are the two main characteristics of a C++ set?
  - Each element is unique
  - The elements are stored in order
- Which data structure is used to implement it?
  - Tree

- Which member function is called to add elements to a C++ set?
  - `insert()`
- What happens if the element we want to add is already present in the set? How can we find out whether this has happened?
  - The insert will fail, because the elements must be unique
  - By inspecting the return value, which is an `std::pair`
  - The second member is a boolean (true if insert succeeded)

- What type of algorithms from the Standard Library can be used with a set?
  - Read-only algorithms
- Why can we not use other algorithms?
  - The elements in a set are const (to maintain the constraints of uniqueness and ordering)
  - Algorithms which modify elements cannot be used
  - Algorithms which change the order of elements cannot be used

- Write a program that creates a set containing the elements 6, 7, 4, 5 and 3
- Add an element with value 3 to the set. Does this succeed? If not, why not?
  - This fails. The set already contains an element with value 3
- Erase the element with value 3 and try again. Does this succeed? If not, why not?
  - This succeed. The set does not contain an element with value 3

- Give an example of a programming problem where a set would be useful
  - Creating a collection of data that does not contain duplicates