

# Map Exercises

- What is the main difference between a set and a map?
  - The elements of a set are a single data item
  - The elements of a map are pairs of data items
- What is the function of the "key" and the "value" in a map?
  - The key is the first element of the pair
  - It is used to look up elements
  - It is also used to order the elements
  - The value is the second element of the pair
  - It is used to store data

- Which member function is called to add elements to a C++ map?
  - `insert()`
- What happens if the element we want to add is already present in the map? How can we find out whether this has happened?
  - If the element is already present, the insert will fail
  - `insert()` returns a pair. The second element of the pair is a boolean which is only true if the insert succeeded

- What type of algorithms from the Standard Library can be used with a map?
  - Read-only algorithms
- Why can we not use other algorithms?
  - Other algorithms either modify or reorder elements, which would violate the map's internal ordering constraints
- Write a simple program which creates a map instance and adds some elements to it. Use both the techniques shown in the video

- What is meant by map subscripting? Does it work the same way as for other containers you have used?
  - In map subscripting, the element is accessed by putting its key inside square brackets [] following the name of the map object
  - If assigning and there is no element with that key, a new element is added
  - If assigning and there is already an element with that key, it is overwritten

- Describe some of the drawbacks of map subscripting
  - Easy to accidentally overwrite data
  - Inconsistent with other container subscripting

- Give an example of a programming problem where a map would be useful
  - Application with indexed data (telephone directory, personnel records, etc)
  - Application with data which is in key-value format (results of database queries, JSON returned from website, etc)