Map Emplace Solutions

emplace()

- What is meant "emplacement", when inserting an element into an STL container?
    - The new element is constructed in-place, in memory allocated by the container
    - This involves fewer copy or move operations than insert()
- Write a program which uses emplacement to add a new element to an STL container

emplace() and maps

- Give some disadvantages of using emplacement with maps
  - A temporary object may be created
  - If there is a duplicate, this temporary object is destroyed without being used
  - Since emplace() uses move semantics, the data used to initialize the temporary object may be lost

try_emplace()

- How does try_emplace() overcome these disadvantages?
  - try_emplace() checks for duplicates before creating any objects
  - If there already is an element with the same key, nothing happens
  - The "first" and "second" members of the new element are initialized by calling their constructors, instead of copying or moving data into std::pair's constructor

try_emplace()

- Briefly describe the interface of std::map's try_emplace member function
  - The first argument to try_emplace is the new element's key
  - The remaining arguments are the arguments to the value's constructor
  - The returned value is the same as insert()
  - An std::pair whose second member is a bool which is true if the new element was inserted
  - If successful, the first member is an iterator to the element that was inserted
  - If not, the first member is an iterator to the element already in the map that has the same key

try_emplace()

- Write a program which uses the try_emplace member function to insert a new element into an std::map

- Check your program works both for inserting a new element and assigning an existing element