- Exercise

In this lesson, we'll solve an exercise.

WE'LL COVER THE FOLLOWING

- Problem statement

Problem statement

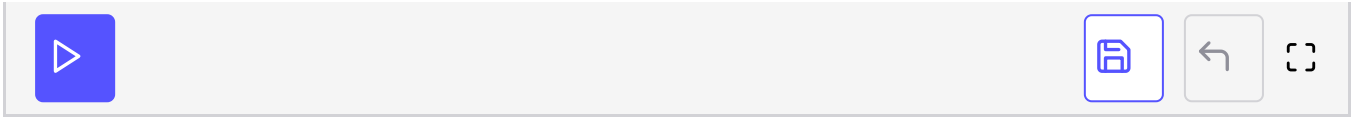
Use `std::unordered_set` instead of `std::unordered_map` and `std::unordered_multiset` instead of `std::unordered_multimap` in the program.

- `std::set`, `std::multiset`, and all variations are only degenerated versions of `std::map` and `std::multimap`, missing the associated value.

```
#include <iostream>
#include <map>
#include <string>
#include <unordered_map>

int main(){

  std::cout << std::endl;

  long long home = 497074123456;
  long long mobile = 4916046123356;

  // constructor
  std::unordered_multimap<std::string, long long> multiMap{{"grimm", home}, {"grimm", mobile}
  std::unordered_map<std::string, int> uniqMap{{"bin", 1}, {"root", 0}, {"nobody", 65834}, {"

  // show the unordered maps
  std::cout << "multiMap: ";
  for(auto m : multiMap) std::cout << '{' << m.first << ", " << m.second << '}';

  std::cout << std::endl;

  std::cout << "uniqMap: ";
  for(auto u : uniqMap) std::cout << '{' << u.first << ", " << u.second << '}';
  std::cout << std::endl;

  std::cout << std::endl;
```

```
// insert elements
long long work = 4970719754513;


multiMap.insert({"grimm", work});
// will not work
// multiMap["grimm-jaud"]=4916012323356;

uniqMap["lp"] = 4;
uniqMap.insert({"sshd", 71});

std::map<std::string, int> myMap{{"ftp", 40}, {"rainer", 999}};
uniqMap.insert(myMap.begin(), myMap.end());

// show the unordered maps
std::cout << "multiMap: ";
for(auto m : multiMap) std::cout << '{' << m.first << ", " << m.second << '}';

std::cout << std::endl;

std::cout << "uniqMap: ";
for(auto u : uniqMap) std::cout << '{' << u.first << ", " << u.second << '}';
std::cout << std::endl;


std::cout << std::endl;
// search for elements

// only grimm
auto iter = multiMap.equal_range("grimm");
std::cout << "grimm: ";
for(auto itVal = iter.first; itVal != iter.second;++itVal){
  std::cout << itVal->second << " ";
}

std::cout << std::endl;

std::cout << "multiMap.count(grimm): " << multiMap.count("grimm") << std::endl;

auto it= uniqMap.find("root");
if (it != uniqMap.end()){
  std::cout << "uniqMap.find(root): " << it->second << std::endl;
  std::cout << "uniqMap[root]: " << uniqMap["root"] << std::endl;
}

// will create a new entry
std::cout << "uniqMap[notAvailable]: " << uniqMap["notAvailable"] << std::endl;

std::cout << std::endl;

// remove
int numMulti= multiMap.erase("grimm");
int numUniq= uniqMap.erase("rainer");

std::cout << "Erased " << numMulti << " times grimm from multiMap." << std::endl;
std::cout << "Erased " << numUniq << " times rainer from uniqMap." << std::endl;

// all
multiMap.clear();
uniqMap.clear();

std::cout << std::endl;
```

```
  std::cout << "multiMap.size(): " << multiMap.size() << std::endl;
  std::cout << "uniqMap.size(): " << uniqMap.size() << std::endl;

  std::cout << std::endl;
}
```



We'll discuss the solution of this exercise in the next lesson.