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How to Iterate over a map in C++

👤 Varun 🕒 September 17, 2016 📄 std::map, STL 💬 1 Comment

In this article we will discuss 3 different ways to Iterate over a map in C++.

Suppose we have a map of string and int as key-value pair i.e.

```
1 | std::map<std::string, int> mapOfWordCount;
```

C++

Now let's see how to iterate over this map in 3 different ways i.e.

Iterate over a map using STL Iterator

First of all, create an iterator of std::map and initialize it to the beginning of map i.e.

```
1 | std::map<std::string, int>::iterator it = mapOfWordCount.begin();
```

Now, let's iterate over the map by incrementing the iterator until it reaches the end of map. Also, map internally stores element in a std::pair format, therefore each iterator object points to an address of pair.

Access key from iterator using,

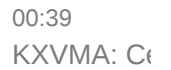
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Access value from iterator using,

Complete example of iterating over a map using stl iterator is as follows,



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```
1 first :: 1
2 second :: 2
3 third :: 3
```

Iterating over the map using C++11 range based for loop

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coding. Check out the following example,

```
1 #include <iostream>
2 #include <map>
3 #include <string>
4 #include <iterator>
5 #include <algorithm>
6
7 int main() {
8
9     std::map<std::string, int> mapOfWordCount;
10    // Insert Element in map
11    mapOfWordCount.insert(std::pair<std::string, int>("first", 1);
12    mapOfWordCount.insert(std::pair<std::string, int>("second", 2);
13    mapOfWordCount.insert(std::pair<std::string, int>("third", 3);
14    mapOfWordCount.insert(std::pair<std::string, int>("third", 4);
15    mapOfWordCount.insert(std::pair<std::string, int>("third", 5);
16
17    // Create a map iterator and point to beginning of map
18    std::map<std::string, int>::iterator it = mapOfWordCount.begin();
19
20    // Iterate over the map using c++11 range based for loop
21    for (std::pair<std::string, int> element : mapOfWordCount) {
22        // Accessing KEY from element
23        std::string word = element.first;
24        // Accessing VALUE from element.
25        int count = element.second;
26        std::cout << word << " :: " << count << std::endl;
27    }
28
29    return 0;
30 }
```

Output:

```
1 first :: 1
2 second :: 2
3 third :: 3
```

Above example is using c++11 feature. So, to compile it on linux use following command,

g++ -std=c++11 example.cpp

Iterating over the map using std::for_each and lambda function

We can also use an stl algorithm std::for_each to iterate over the map. It will iterate on each of the map entry and call the callback provided by us. In below example we will use a lambda function as callback. Lambda function will receive each of the map entry in a pair. Checkout complete example as follows,

```
1 #include <iostream>
```

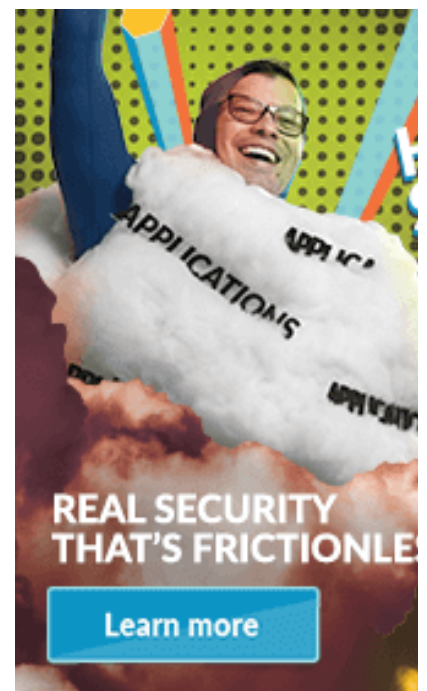
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```
2 #include <map>
3 #include <string>
4 #include <iterator>
5 #include <algorithm>
6
7 int main() {
8
9     std::map<std::string, int> mapOfWordCount;
10    // Insert Element in map
11    mapOfWordCount.insert(std::pair<std::string, int>("first", 1));
12    mapOfWordCount.insert(std::pair<std::string, int>("second", 2));
13    mapOfWordCount.insert(std::pair<std::string, int>("third", 3));
14    mapOfWordCount.insert(std::pair<std::string, int>("third", 4));
15    mapOfWordCount.insert(std::pair<std::string, int>("third", 5));
16
17    // Create a map iterator and point to beginning of map
18    std::map<std::string, int>::iterator it = mapOfWordCount.begin();
19
20    // Iterate over a map using std::for_each and Lambda function
21    std::for_each(mapOfWordCount.begin(), mapOfWordCount.end(),
22        [](std::pair<std::string, int> element){
23            // Accessing KEY from element
24            std::string word = element.first;
25            // Accessing VALUE from element.
26            int count = element.second;
27            std::cout<<word<<" :: "<<count<<std::endl;
28        });
29
30    return 0;
31 }
```

Search

Output:

```
1 first :: 1
2 second :: 2
3 third :: 3
```

Above example is using c++11 feature. So, to compile it on linux use following command,

`g++ -std=c++11 example.cpp`

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Merge / Join two or more lists

Remove Duplicates from a List

Convert a list to string

Remove element from a list by value or Index

Remove multiple elements from list

Python : Dictionary

Creating Dictionaries in Python

Iterating over Dictionaries in Python

Check if a key exists in Dictionary

Get list of all the keys in Dictionary

Get list of all the Values in a Dictionary

Remove multiple keys in Dictionary while Iterating

Remove a key from Dictionary

Add key/value pairs in Dictionary

Find keys by value in Dictionary

Sort a Dictionary by key or Value

Copy a dictionary | Shallow vs Deep Copy

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Erasing an element

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Associating Multiple values with same Key

Remove elements while Iterating

Update the value of an existing key

Get all keys by a value in HashMap

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