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Experiment No. 8

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Sub - OOPL

Aim:- Write a program in C++ to use map associative containers. The keys will be the names of states & the values will be the names of states will be the populations of the states. When the program runs, the user is prompted to type the name of a state. The program then looks in the map, using the state name as an index & returns the population of the state.

Objectives:
- To understand the concept of standard template library function.
- To understand the function related to map associative containers.

Software Used: Linux Operating Systems, GCC.

Theory:
Maps are associative containers that store elements in a mapped fashion. Each element has a key value & a mapped value. No two mapped values can have same key values.

Some basic functions associated with Map:
begin() - Returns an iterator to the first element in the map.
end() - Returns an iterator to the theoretical element that follows last element in the map.
size() - Returns the number of elements in the map.
max_size() - Returns the maximum number of elements that the map can hold.

empty() - Returns whether the map is empty
pair insert(keyvalue, mapvalue) - Adds a new element to the map.
erase(iterator position) - Removes the element at the position pointed by the iterator.
erase(const g) - Removes the key value 'g' from the map.
clear() - Removes all the elements from the map.

Creating Objects:

Maps are associative containers that store elements formed by a combination of a key value & a mapped value, following a specific order.

In a map, the key values are generally used to sort & uniquely identify the elements, while the mapped values store the content associated to this key. The types of key & mapped value may differ, & are grouped together in member type ~~value~~ value_type, which is a pair type combining both:

```
typedef pair<const key, T> value type;
```

For inserting the values.

```
map<int, int> gquiz;
//insert elements in random order
gquiz.insert(pair<int, int>(1,40));
gquiz.insert(pair<int, int>(2,30));
gquiz.insert(pair<int, int>(3,60));
gquiz.insert(pair<int, int>(4,20));
gquiz.insert(pair<int, int>(5,50));
gquiz.insert(pair<int, int>(6,50));
gquiz.insert(pair<int, int>(7,10));
```

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Algorithm:

1. Start
2. Create an class state with neither function accept() & display()
3. Create an object of map global.
4. Menu for accepting data & to find the population for the particular state.
5. With object access the member function
6. Repeat the process
7. Stop.

Input: State & population value from the user side.

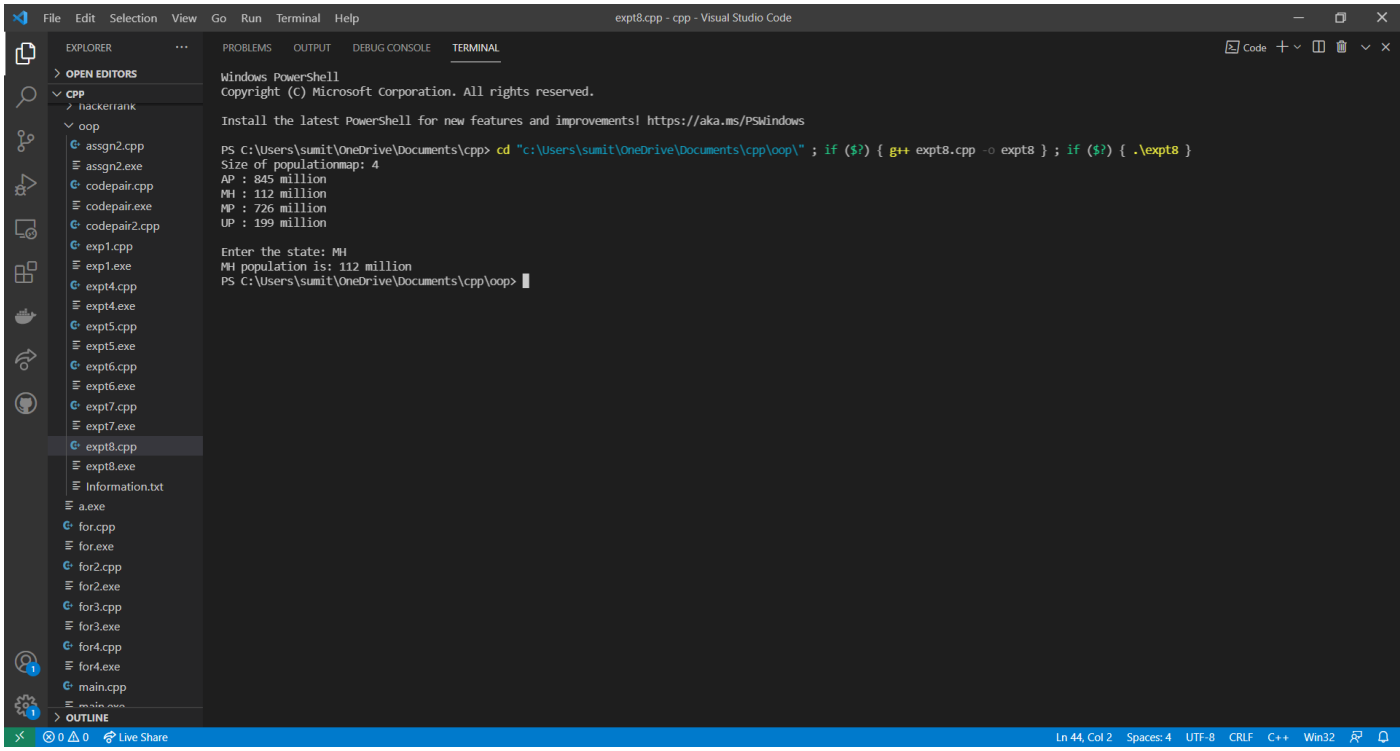
Output: 1) Displaying the values related to state with population

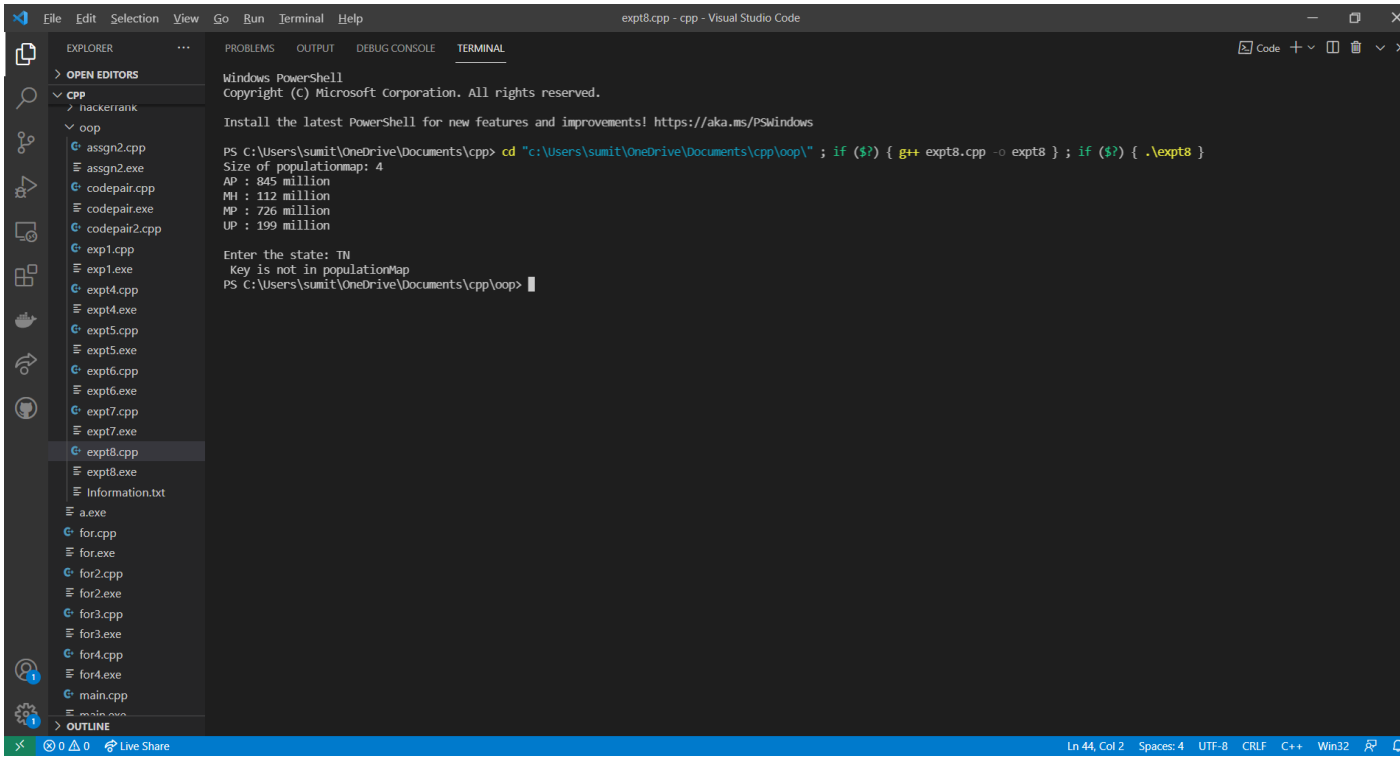
Conclusion:
Thus we studied concepts of standard template container Map & its operation related to it.

Program:

```
#include<iostream>
#include<map>
#include<string>
#include<utility>
using namespace std;


int main()
{
    map <string,int> populationMap;

    populationMap.insert(pair<string,int>("MH", 112));
    populationMap.insert(pair<string,int>("UP", 199));
    populationMap.insert(pair<string,int>("MP", 726));
    populationMap.insert(pair<string,int>("AP", 845));


    map<string,int>::iterator iter = populationMap.end();


    cout<<"Size of populationmap: "<<populationMap.size()<<"\n";

    for(iter=populationMap.begin(); iter!=populationMap.end(); ++iter)
    {
        cout<<iter ->first<<" : "<<iter->second<<" million\n";

    }

    string state;
    cout<<"\nEnter the state: ";
    cin>>state;


    iter = populationMap.find(state);
    if(iter!=populationMap.end())
      cout<<state<<" population is: "<<iter->second<<" million\n";
    else
    cout<<" Key is not in populationMap ";


    populationMap.clear();

    return 0;
}
```

Output:


File Edit Selection View Go Run Terminal Help
expt8.cpp - cpp - Visual Studio Code
EXPLORER
OPEN EDITORS
CPP
oop
assgn2.cpp
assgn2.exe
codepair.cpp
codepair.exe
codepair2.cpp
exp1.cpp
exp1.exe
expt4.cpp
expt4.exe
expt5.cpp
expt5.exe
expt6.cpp
expt6.exe
expt7.cpp
expt7.exe
expt8.cpp
expt8.exe
Information.txt
a.exe
for.cpp
for.exe
for2.cpp
for2.exe
for3.cpp
for3.exe
for4.cpp
for4.exe
main.cpp
OUTLINE
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
Code
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.
Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows
PS C:\Users\sumit\OneDrive\Documents\cpp> cd "c:\Users\sumit\OneDrive\Documents\cpp\oop\" ; if ($?) { g++ expt8.cpp -o expt8 } ; if ($?) { .\expt8 }
Size of populationmap: 4
AP : 845 million
MH : 112 million
MP : 726 million
UP : 199 million
Enter the state: MH
MH population is: 112 million
PS C:\Users\sumit\OneDrive\Documents\cpp\oop>
0 0 Live Share
Ln 44, Col 2 Spaces: 4 UTF-8 CRLF C++ Win32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expt6.cpp
expt6.exe
expt7.cpp
expt7.exe
expt8.cpp
expt8.exe
Information.txt
a.exe
for.cpp
for.exe
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AP : 845 million
MH : 112 million
MP : 726 million
UP : 199 million
Enter the state: TN
Key is not in populationMap
PS C:\Users\sumit\OneDrive\Documents\cpp\oop>
0 0 Live Share
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