C++ Programming
STL Practice #4

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Teaching, Training and Coaching since more than a decade!

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Practice: Find full names

- Given N **full-names** as following
  - Each full name name starts with number K: # of words,
  - Then read K words
- Input
  - 5   [5 full names]
  - 3 mostafa saad ibrahim   [3 for 3 names: first, second, third names]
  - 3 mostafa saad ali
  - 3 asmaa talaat morsi
  - 2 asmaa ashraf
  - 4 mostafa saad ibrahim mohamed

Practice: Find full names

- Then read Q for Q queries. Each query is a sub-full name
  - E.g. again per sub-full name: k, then k words
- Print all full names start with this sub-full name
- Input
  - 3   [3 queries]
  - 2 mostafa saad ⇒ [mostafa saad ibrahim, mostafa saad ali, mostafa saad ibrahim mohamed]
  - 1 asmaa ⇒ [asmaa talaat morsi, asmaa ashraf]
  - 3 mostafa saad ibrahim ⇒ [mostafa saad ibrahim, mostafa saad ibrahim mohamed]

Practice: Find full names

- Here is an idea using map: map<string, vector<string> >
- For every full name, generate all sub-full names. Map them to full name
- E.g. for mostafa saad ibrahim, we add 3 entries to map
  - mostafa ⇒ mostafa saad ibrahim
  - mostafa saad ⇒ mostafa saad ibrahim
  - mostafa saad ibrahim ⇒ mostafa saad ibrahim
- Doing that for every full-name, we can easily find the list of full names given a sub-full name prefix
- Code
  - First, for every full name, add all of its sub-full name
  - Second, answer each query

Practice: Find full names

```cpp
int n;
map<string, vector<string> > mp;

cin>>n;
for (int i = 0; i < n; ++i) {
    int len;
    cin>>len;

    string cur_full_name = "";
    string str;
    vector<string> names;
    for (int j = 0; j < len; ++j) {
        cin>>str;

        if(j)
            cur_full_name += " ";
        cur_full_name += str;
        names.push_back(cur_full_name);
    }

    for(auto str: names)
        mp[str].push_back(cur_full_name);
}
```

Practice: Find full names

```cpp
int q;
cin>>q;
while(q--)
{
    int len;
    cin>>len;

    string cur_full_name = "";
    string str;
    for (int j = 0; j < len; ++j) {
        cin>>str;

        if(j)
            cur_full_name += "";
        cur_full_name += str;
    }
    if(mp.count(cur_full_name))
    {
        for(auto str : mp[cur_full_name])
            cout<<str<<"\n";
    }
    else {
        cout<<"No such sub-full name\n";
    }
}
```

"Acquire knowledge and impart it to the people."

"Seek knowledge from the Cradle to the Grave."