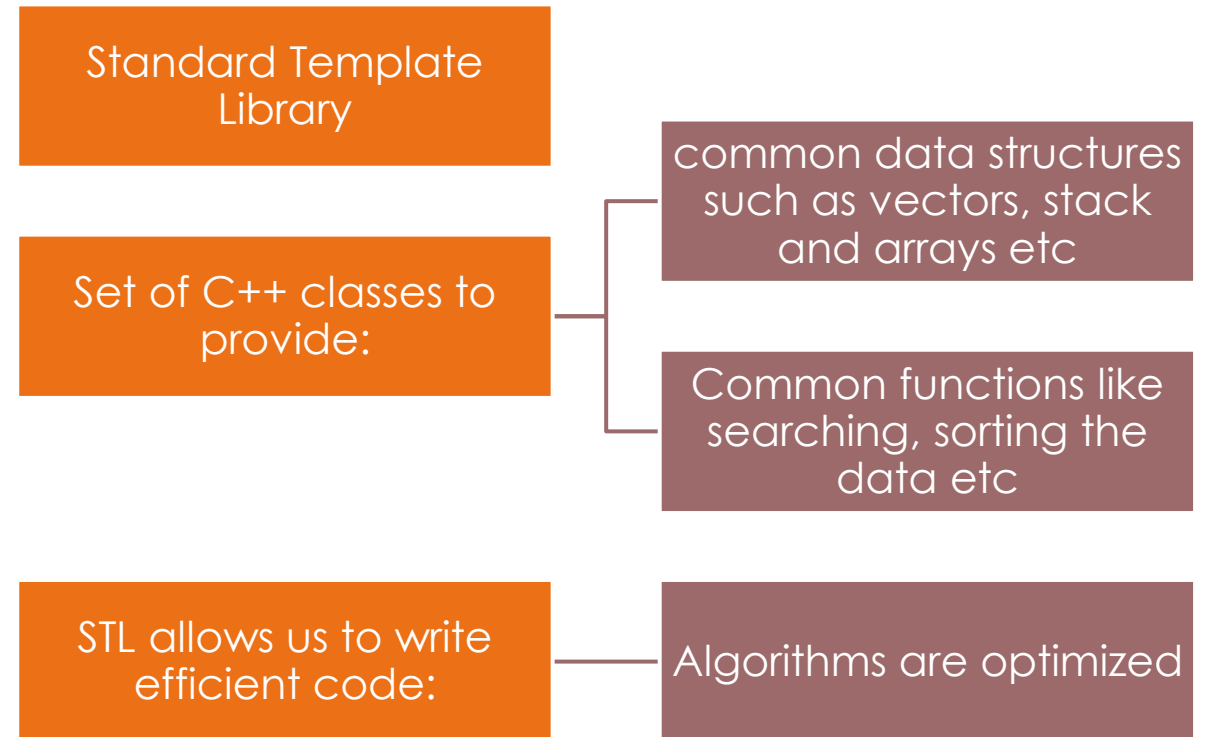




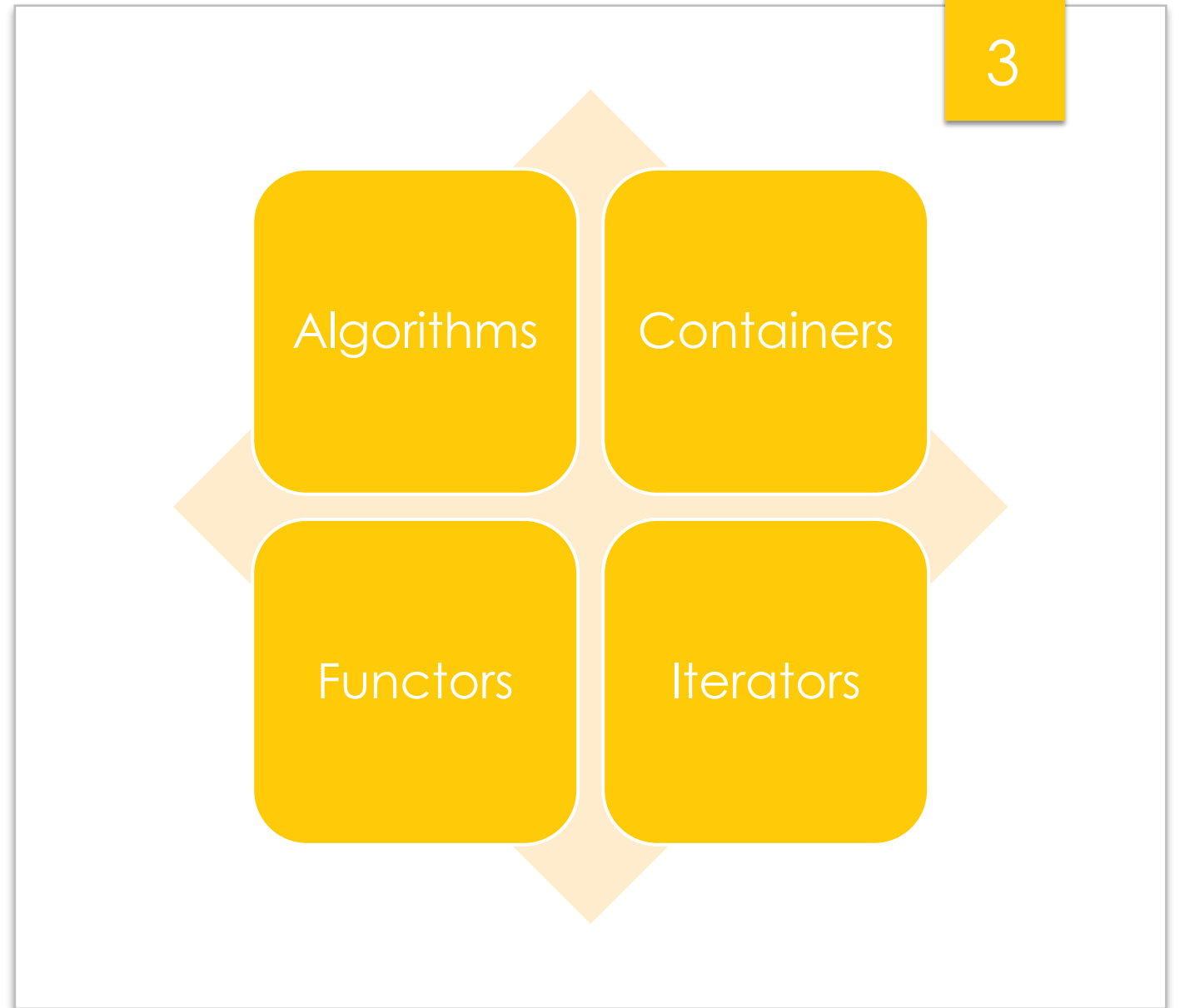
Fundamentals of Programming: STL in C++

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What is a STL



STL Components



Containers

- ▶ Containers or container classes allow us to store data
 - ▶ Vectors
 - ▶ Lists
 - ▶ Queue
 - ▶ Stack

Vector

5

Vector is a dynamic array



It has ability to resize when an element is inserted or deleted



Vector class is defined in
<vector> header file

```
#include <vector>
using namespace std;

int main() {

vector<string> names;

names.push_back("Ali");
names.push_back("Ahsan");
cout<<names.size();

}
```

Creating a Vector

```
int main() {  
  
    vector<string> names;  
    string name;  
    for(int i=0;i<5;i++){  
        cin>>name;  
        names.push_back(name);  
    }  
  
}
```

Creating a vector

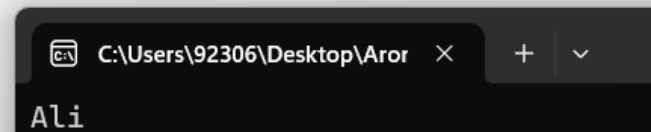
size() function

RETURNS THE SIZE OF A VECTOR


```
vector<string> names;  
  
names.push_back("Ali");  
names.push_back("Ahsan");  
  
for (auto n = names.begin(); n != names.end(); n++)  
    cout << *n << " ";  
  
}
```

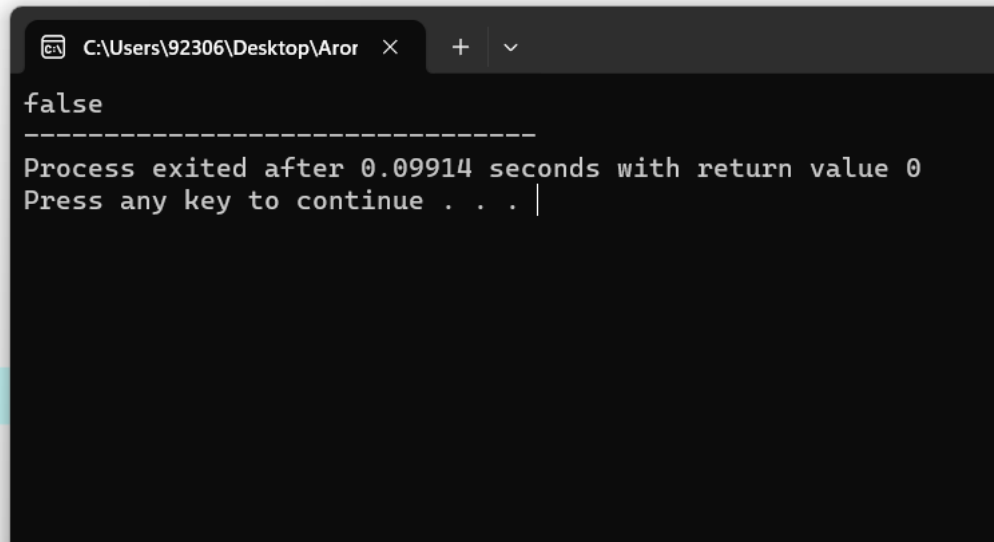
Iterating a Vector

```
vector<string> names;  
  
names.push_back("Ali");  
names.push_back("Ahsan");  
names.pop_back();  
for (auto n = names.begin(); n != names.end(); n++)  
    cout << *n << " ";  
}
```



Removing an element from the vector

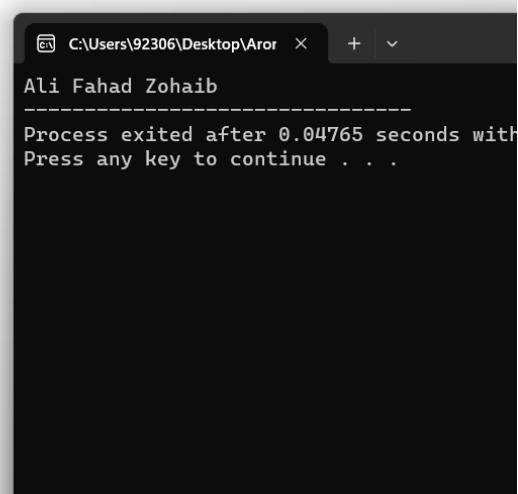
```
int main() {  
    vector<string> names;  
  
    names.push_back("Ali");  
    names.push_back("Ahsan");  
  
    cout<<boolalpha<<names.empty();  
}
```

A screenshot of a terminal window with a dark background. The window title bar shows the file path 'C:\Users\92306\Desktop\Aror' and standard window controls. The terminal output shows the word 'false' on the first line, followed by a horizontal line of dashes. Below the dashes, it says 'Process exited after 0.09914 seconds with return value 0' and 'Press any key to continue . . . |' with a cursor.

```
C:\Users\92306\Desktop\Aror  x  +  v  
false  
-----  
Process exited after 0.09914 seconds with return value 0  
Press any key to continue . . . |
```

Checking if the vector is empty or not

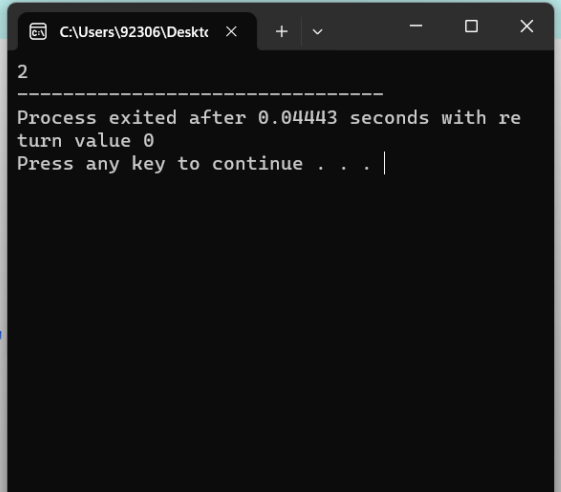
```
vector<string> names;  
  
names.push_back("Fahad");  
names.push_back("Zohaib");  
names.push_back("Ali");  
  
sort(names.begin(), names.end());  
  
for(auto n=names.begin(); n!=names.end(); n++){  
    cout<<*n<<" ";  
}
```

A screenshot of a terminal window showing the output of a C++ program. The window title is "C:\Users\92306\Desktop\Aror". The output displays the names "Ali Fahad Zohaib" on a single line, followed by a separator line of dashes, and then a message indicating the process exited after 0.04765 seconds with the instruction "Press any key to continue . . .".

```
C:\Users\92306\Desktop\Aror x + v  
Ali Fahad Zohaib  
-----  
Process exited after 0.04765 seconds with  
Press any key to continue . . .
```

Algorithms

```
vector<string> names;  
  
names.push_back("Fahad");  
names.push_back("Zohaib");  
names.push_back("Ali");  
names.push_back("Fahad");  
  
cout<<count(names.begin(),names.end(),"  
  
}
```



```
C:\Users\92306\Desktop  
2  
-----  
Process exited after 0.04443 seconds with re  
turn value 0  
Press any key to continue . . . |
```

Algorithms