

std::vector

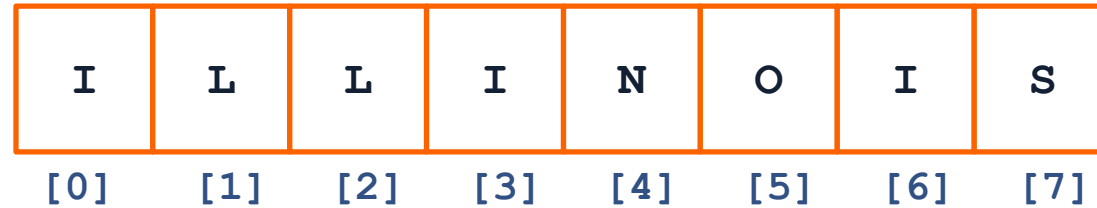
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A **template type** is a special type that can take on different types when the type is initialized. **std::vector** uses a template type:

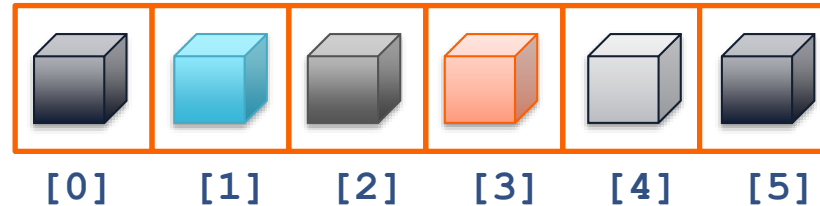
std::vector<char>



std::vector<int>



std::vector<uiuc::Cube>



std::vector

std::vector standard library class that provides the functionality of a **dynamically growing array** with a “templated” type. Key ideas:

Defined in:

```
#include <vector>
```

Initialization:

```
std::vector<T> v;
```

Add to (back) of array:

```
::push_back(T);
```

Access specific element:

```
::operator[](unsigned pos);
```

Number of elements:

```
::size()
```

Template Type

When initializing a “templated” type, the template type goes inside of `< >` at the end of the type name:

```
std::vector<char> v1;  
std::vector<int> v2;  
std::vector<uiuc::Cube> v3;
```

cpp-vector/ex1/main.cpp

```
8 #include <vector>
9 #include <iostream>
10
11 int main() {
12     std::vector<int> v;
13     v.push_back( 2 );
14     v.push_back( 3 );
15     v.push_back( 5 );
16
17     std::cout << v[0] << std::endl;
18     std::cout << v[1] << std::endl;
19     std::cout << v[2] << std::endl;
20
21     return 0;
22 }
```

cpp-vector/ex2/main.cpp

```
8  #include <vector>
9  #include <iostream>
10
11 int main() {
12     std::vector<int> v;
13     for (int i = 0; i < 100; i++) {
14         v.push_back( i * i );
15     }
16
17     std::cout << v[12] << std::endl;
18
19     return 0;
20 }
```