

## Vector Built-in Functions:

### 1. Initialization

Name	Details	Time Complexity
<b>vector&lt;type&gt;v;</b>	Construct a vector with 0 elements.	O(1)
<b>vector&lt;type&gt;v(N);</b>	Construct a vector with N elements.	O(N)
<b>vector&lt;type&gt;v(N,V);</b>	Construct a vector with N elements and the value will be V.	O(N)
<b>vector&lt;type&gt;v(v2);</b>	Construct a vector by copying another vector v2.	O(N)
<b>vector&lt;type&gt;v(A,A+N);</b>	Construct a vector by copying all elements from an array A of size N.	O(N)

### 2. Capacity

Name	Details	Time Complexity
<b>v.size()</b>	Returns the size of the vector.	O(1)
<b>v.max_size()</b>	Returns the maximum size that the vector can hold.	O(1)
<b>v.capacity()</b>	Returns the current available capacity of the vector.	O(1)
<b>v.clear()</b>	Clears the vector elements. Do not delete the memory, only clear the value.	O(N)
<b>v.empty()</b>	Return true/false if the vector is empty or not.	O(1)
<b>v.resize()</b>	Change the size of the vector.	O(K); where K is the difference between new size and current size.

### 3. Modifiers

Name	Details	Time Complexity
<b>v=</b> or <b>v.assign()</b>	Assign another vector.	$O(N)$ if sizes are different, $O(1)$ otherwise.
<b>v.push_back()</b>	Add an element to the end.	$O(1)$
<b>v.pop_back()</b>	Remove the last element.	$O(1)$
<b>v.insert()</b>	Insert elements at a specific position.	$O(N+K)$ ; where K is the number of elements to be inserted.
<b>v.erase()</b>	Delete elements from a specific position.	$O(N+K)$ ; where K is the number of elements to be deleted.
<b>replace(v.begin(),v.end(),value,replace_value)</b>	Replace all the value with replace_value. Not under a vector.	$O(N)$
<b>find(v.begin(),v.end(),V)</b>	Find the value V. Not under a vector.	$O(N)$

### 4. Element access

Name	Details	Time Complexity
<b>v[i]</b>	Access the ith element.	$O(1)$
<b>v.at(i)</b>	Access the ith element.	$O(1)$
<b>v.back()</b>	Access the last element.	$O(1)$
<b>v.front()</b>	Access the first element.	$O(1)$

## 5. Iterators

Name	Details	Time Complexity
<b>v.begin()</b>	Pointer to the first element.	O(1)
<b>v.end()</b>	Pointer to the last element.	O(1)