The Details

We'll finish this section by learning some terminologies present in unordered associative containers.

The unordered associative containers store their indices in buckets. In which bucket the index goes is due to the hash function, which maps the key to the index. If different keys are mapped to the same index, it's called a collision. The hash function tries to avoid this.

Indices are typically be stored in the bucket as a linked list. Since the access to the bucket is constant, the access in the bucket is linear. The number of buckets is called capacity, the average number of elements for each bucket is called the load factor. In general, the C++ runtime generates new buckets if the load factor is greater than 1. This process is called rehashing and can also explicitly be triggered:

```
// hashInfo.cpp
#include <iostream>
#include <unordered_set>
using namespace std;

void getInfo(const unordered_set<int>& hash){
  cout << "hash.bucket_count(): " << hash.bucket_count();
  cout << "hash.load_factor(): " << hash.load_factor();
}

int main(){

  // Create an unoredered set and initialize it with the array
        // Set will contain only random elements
  int arr[100];
  for(int i=0; i<100; i++)
    arr[i] = (rand() % 100) + 1;
  unordered_set<int> hash(arr, arr + sizeof(arr) / sizeof(int));
  cout << "hash.max_load_factor():\t" << hash.max_load_factor() << endl; // hash.max_load_fac

  getInfo(hash);
  //hash.bucket_count(): 103hash.load_factor(): 0.660194
  cout<<endl;

  hash.insert(500);
  cout << "hash.bucket(500):\t" << hash.bucket(500) << endl; // 5

  getInfo(hash);
```

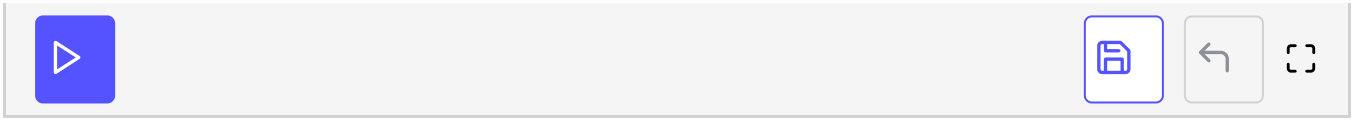
```
  cout<<endl;
  //hash.bucket_count(): 103hash.load_factor(): 0.669903


  hash.rehash(500);

  getInfo(hash);
  //hash.bucket_count(): 503hash.load_factor(): 0.137177500

  cout << endl << "hash.bucket(500):\t" << hash.bucket(500); //hash.bucket(500):        500

  return 0;
}
```



Details to the hash function

With the method `max_load_factor`, you can read and set the load factor. So you can influence the probability of collisions and rehashing. I want to emphasize one point in the short example above. The key 500 is at first in the 5th bucket, but after rehashing is in the 500th bucket.