Maps

So far in this course you have seen container data structures, like the `vector` and the `array`. Additionally, you have used classes in your code for this project. Container data structures are fantastic for storing ordered data, and classes are useful for grouping related data and functions together, but neither of these data structures is optimal for storing associated data.

Dictionary Example

A map (alternatively **hash table**, hash map, or dictionary) is a data structure that uses *key/value* pairs to store data, and provides efficient lookup and insertion of the data. The name "dictionary" should provide an excellent idea of how these work, since a dictionary is a real life example of a map. Here is a slightly edited entry from **www.dictionary.com** defining the word "word":

> word
>
> - a unit of language, consisting of one or more spoken sounds or their written representation, that functions as a principal carrier of meaning.
> - speech or talk: to express one's emotion in words.
> - a short talk or conversation: "Marston, I'd like a word with you."
> - an expression or utterance: a word of warning.

Data Representation

If you were to store this data in your program, you would probably want to be able to quickly look up the definitions using the *key* "word". With a map, a vector of definitions could be stored as the *value* corresponding to the "word" key:

Key `string`	Value `vector<string>`
`"word"`	`<"a unit of language, consisting of one or more spoken sounds or their written representation, that functions as a principal carrier of meaning.", "speech or talk: to express one's emotion in words.", "a short talk or conversation: 'Marston, I'd like a word with you.'", "an expression or utterance: a word of warning.">'`

In the following notebook, you will learn how to use an `unordered_map`, which is the C++ standard library implementation of a map. Although C++ has several different implementations of map data structures which are similar, `unordered_map` is the structure that you will use in your project.