2.1a What is the difference between a simple container and an associative container?

2.1b Is a dictionary a simple or associative container? Is the ordering a linear ordering or a weak ordering?

2.1c Is a phone book an example of a simple or associative container?

2.1d A spell checker in a program such as a word processor keeps a list of recognized spellings of known words. Is such a collection kept as a simple or associative container?

2.1e What does it appear that the following function does?

```
#include <map>
#include <string>
#include <iostream>

int main() {
    std::map<std::pair<std::string, std::string>, std::string> birthdays {
        {{"Prasad", "Rajendra"}, "December 3, 1884"},
        {{"Mirza",  "Iskander"}, "November 15, 1899"},
        {{"Rahman", "Zilur"},    "March 9, 1929"}
    };

    for ( auto &pair : birthdays )
        std::cout << pair.first.second << " "
                  << pair.first.first << ": "
                  << pair.second << std::endl;

    return 0;
}
```

2.1f A hash table that stores an associative array is sometimes described as a *look-up* table. For example, in C++, the statement

```
#define MIN_VALUE -32
#define MAX_VALUE  31
```

will change

```
    for ( int i = MIN_VALUE; i <= MAX_VALUE; ++i ) {
        // ...
    }
```

to

```
    for ( int i = -32; i <= 31; ++i ) {
        // ...
    }
```

Why would the preprocessor need a look-up table to store such definitions?

2.1g What are the six relationships we are considering in this class?

2.1h Is every linear ordering of a finite number of objects a hierarchical ordering? Is every hierarchical ordering a partial ordering?

2.1i Specify which relationship most appropriately describes the following data sets:

1. The integers
2. Dictionary
3. The chain of command in the military
4. A sequences of tasks which must be completed, some of which must be completed before others can be started
5. A road map
6. The relationship between the Object class of C# and Java and subclasses
7. The real numbers
8. Courses and their prerequisites
9. A circuit layout
10. Main memory
11. Directories in a file system
12. The alphabet
13. The organization of a corporation
14. Phone book
15. The scope of variables in a function

2.1j Describe the difference between an explicitly defined and an implicitly defined relation.

2.1k Describe the Container ADT. Describe a Sorted List ADT.