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Program Summary: In this phase, we expanded on the program created in Phase 1. To begin, we created a new option in the menu that allows the connection of friends, which was achieved by a new vector attribute in Person class. We also created a method to create IDs for each friend, which was used to update the print_person method. Lastly, we have a print_friends method that prints an individual's friends in sorted order.

C++ version: C++11

Explanation:

In terms of important structure, our enhancements to the loadDB method use a `vector<vector<pair<string, string>>>`

that is used as a 2D vector to first hold vectors of each person's list of friends (in first and last name format). After having loaded every person into the linked list, then I use this vector to search for each individual's list of friends in the network to add to the respective myfriends vector.

To sort each individual's friends, we used selection sort on each friend's ID code.

References:

No references were used.

Instructions:

To run this, first ensure all files are in the same directory. Then, based on what the main program is (assuming here it's test_network.cpp, which, however, we did not include in the GitHub repo since it's a given test file), then we run in the terminal after locating the correct directory:

```
g++ -std=c++11 test_network.cpp network.cpp person.cpp contact.cpp date.cpp misc.cpp  
./a.out
```

This will bring up the menu and the user can choose which option to select.

Some test cases and results:

One test case we tried is first loading in a text file using the new loadDB method (where some people may have a list of friends), and then using the new option 6 to connect friends, which is shown below. We have also included the sample_input.txt file used for these tests in the GitHub repo.

```
Make friends:
Person 1
First Name: Julia Scarlett Elizabeth
Last Name: Louis-Dreyfus
Person 2
First Name: Webs
Last Name: Burg

Louis-Dreyfus, Julia Scarlett Elizabeth
January 13, 1961
Phone (Home): 310-192-2011
Email (Work): julia@wh.com

Burg, Webs
January 20, 1999
Phone (Home): 408-456-7814
Email (School): WB@usc.edu
```

Then, another test case we tried is using the updated saveDB method, and the output txt file would look something like below, where it also demonstrates the use of the codeName method:

```
Louis-Dreyfus, Julia Scarlett Elizabeth
January 13, 1961
Phone (Home): 310-192-2011
Email (Work): julia@wh.com
shawnzhaohao (Shawn Zhao)
websburg (Webs Burg)
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Zhao, Shawn
August 19, 1999
Phone (Home): 408-456-2891
Email (School): sz@usc.edu
juliascarlettelizabethylouis-dreyfus (Julia Scarlett Elizabeth Louis-Dreyfus)
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Burg, Webs
January 20, 1999
Phone (Home): 408-456-7814
Email (School): WB@usc.edu
juliascarlettelizabethylouis-dreyfus (Julia Scarlett Elizabeth Louis-Dreyfus)
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```

The `print_friends` method was not used in the program menu itself, but we tested it on our own and it does indeed print each friend in the correct sorted order.