

problem: phone book

brief

The purpose of this problem is to build a program to maintain a simple on-line phone book which allows users to enter names & phone numbers for their contacts and perform different types of search for names/numbers.

Java outcomes (see other notes for explanation)

- HashMap
- GUI components & event handling
- control structures (conditional, foreach)
- declaration of classes & methods

stage 1

- set up a skeletal JFrame application;
- declare a HashMap to map {names -> phone numbers}
NB: think about the best types for keys & values;
- (for now) initialise the HashMap in your program code;
- use some type of text component to show the contents of the HashMap

stage 2

- use a textfield and a button to allow users to enter contact names and then initiate a search for a phone number – use a second textfield to show the phone number which matches the name entered;
- add something sensible to deal with a situation when a user searches for name which is not in the phonebook (investigate option panes);

stage 3

- provide a facility to add a new entry (name & number) to the phone book;
- provide some mechanism to check (and report) a new entry with the same name as an existing entry;

stage 4

- provide a facility to remove an entry from the phone book;
- check that the entry to remove exists & do something appropriate if it does not;

The following stages are a little more advanced. You will need to use iterative control structures and linear collections (arrays or vectors, etc).

stage 5

- add a facility to search for entries based on the number (instead of the name);
- include appropriate checks & responses for failed searches;

stage 6

- extend the work so it can associate mobile number, landline & email address with a contact name – there are many alternative ways to achieve this, some good, some messy. Think about your design and discuss it with others before you start;
- integrate your new approach with your work from earlier stages (think about the best way to display results, etc);

stage 7

- allow users to search for partial names, email addresses, numbers, etc;

stage 8

- you are currently using a HashMap (or some other map) as the basis for your phone-book. Use one or more arrays to write your own class which provides the same functionality as the HashMap;
- devise a mechanism to compare the time it takes to search for entries with the new version (using arrays) and the version using a HashMap. Explain your findings.