

# Cloud Dev - Take-Home Exercise

This serves as alternative to the “live coding” session we do as part of the tech screen.

(Credits to [@ Eliana Crawford](#) - also see [Interview Questions - Cloud Engineering](#) which has coderpad samples for this)

## Coding Take-Home: Phone Book

In a language of your choice, implement a data structure (or multiple data structures, depending on implementation) representing a phone book with the following properties:

- It should store contact records each containing a first name (required), a last name (required), an address (optional), and a phone number (required).
- Phone numbers are expected to be unique per contact and 10 digits long (assume that phone numbers do not contain country codes or non-numeric characters for simplicity).
- Multiple contacts may have the same addresses, first names, and last names.

Implement the following methods for interacting with the phone book:

- A method that takes a phone number and looks up and returns the contact associated with the phone number
- A method that consumes a first name, last name, phone number, and address (optional) and creates a new contact in the phone book. The method should not allow conflicts (two contacts with the same phone number).
- A method for updating a contact (any fields associated with a contact should be able to be updated)
- A method for looking up a list of contacts by first and/or last name. The method should take two variables, one for first name and one for last name, and at least one of them must not be empty.
- A method for looking up a list of contacts by city (assume all addresses are in the form "[street address], [city], [state/province], [zip code], [country]")
- A method for deleting a contact by phone number. No data pertaining to the contact should remain anywhere in the data structure once the contact is deleted.

## Bonus Questions

- A method for looking up a list of contacts by an arbitrary string (could be a city, name, country, zip code, etc.). It is expected that the string is a complete value (i.e. not half of a country name or the first three digits of a phone number). The method should return all contacts with metadata containing that string. There is flexibility here in how this function is implemented. Feel free to decide which fields should be searchable.
- A method for looking up a list of contacts by the phone number prefix. The method should consume a string containing n number of digits, where  $0 < n \leq 10$  and return an array of all contacts whose phone numbers start with the given prefix.

While writing your code, please prioritize

- Code should be intuitive, readable, and something that other developers would be able to run and maintain themselves with limited context.
- Scale: code should continue to run quickly even if the phone book grows to include very large numbers of contacts.
- Be ready to walk through your code in a live interview and run it on your local machine.
- Have fun!