Following are the Software and libraries which I have used:

Operating System-- windows 10.

Python (Programming Language) and MySQL as Database.

you must have installed XAMPP (3.2.2) and Python 3.

In python we need to import following libraries:

PyMySQL

regex

**Steps to compile and run the application:**

1. Open XAMPP and turn on mysql database on localhost.
2. Import phone.SQL File into MYSQL database.
3. Import PyMySQL and regex library in Python.
4. Run the Phone.py.
5. It would ask user input for adding contact, delete contact and show all contacts.

**Description of how this code works, compilation:**

**First it makes connection with phone database. It doesn’t require any password. Phone database has PhoenDir table which stores contact information. In the end it commits the changes and close the database connection.**

After running phone.py it asks user to make selection. 1 for adding a new contact, 2 for deleting existing contact using name, 3 for deleting contact using phone number, 4 for showing all contacts.

There are 4 functions for performing each operation. Suppose user enters 1 (Add contact) then is would ask for name and number. Then is validates input after validation there is an insert query which insert data in database. If validation fails, it prompts “Contact is unacceptable” and if validation passes it shows “contact has been added successfully”.

When user enter 2 for deleting data using person name it calls DeletebyName() function which asks user to enter person name then finds contact from database using name and deletes the contact from database. It uses the delete query.

When user enter 3 for deleting data using phone number it calls DeletebyNumber() function which asks user to enter phone number then finds contact from database using phone number and deletes the contact from database. It uses the delete query.

When user enter 4 for showing all contacts it uses a select query to show all contacts from database.

**Regular Expressions:**

**For Phone Number:** ^\+?\d{0,3}\s?\(?\d{0,5}(\)?[-.\s]?\d{3}[-.\s]?\d{4})?$

**For Name:** ^[A-Z]\'?[A-Z]?[a-z]\*\,?\s?[A-Z]?\'?[A-Z]?[a-z]\*\-?\s?[A-Z]?[a-z]\*\.?$

**Assumptions:**

* User would not add same name contact again. (Primary Key)
* If name or phone number is invalid, it shows contact is not acceptable. Means, it might possible only name is invalid or only phone number is invalid, or both are invalid.

**Pros of using this approach:**

* Used parameterized code for mysql which allows me to handle apostrophes (‘).
* Created functions for each operation which allows us to perform each individual operation, if error occurs in function, it doesn’t affect other operations.
* I used python and it’s like 60 lines of code. Very concise and accurate.

**Cons of using this approach:**

* Every time user has to run application for performing each operation.