Lab#2, NLP@CGU Spring 2023

This is due on 2023/03/13 15:30, commit to your github as a PDF (lab2.pdf) (File>Print>Save as PDF).

IMPORTANT: After copying this notebook to your Google Drive, please paste a link to it below. To get a publicly-accessible link, hit the *Share* button at the top right, then click "Get shareable link" and copy over the result. If you fail to do this, you will receive no credit for this lab!

LINK: paste your link here

https://colab.research.google.com/drive/1cF_1hopNnub93BHgT90lOnPEKCI9n_CQ?usp=sharing

```
from google.colab import drive
drive.mount('/content/drive')

    Mounted at /content/drive
```

Student ID:

Name:

Question 1 (100 points)

Implementing Trie in Python.

Trie is a very useful data structure. It is commonly used to represent a dictionary for looking up words in a vocabulary.

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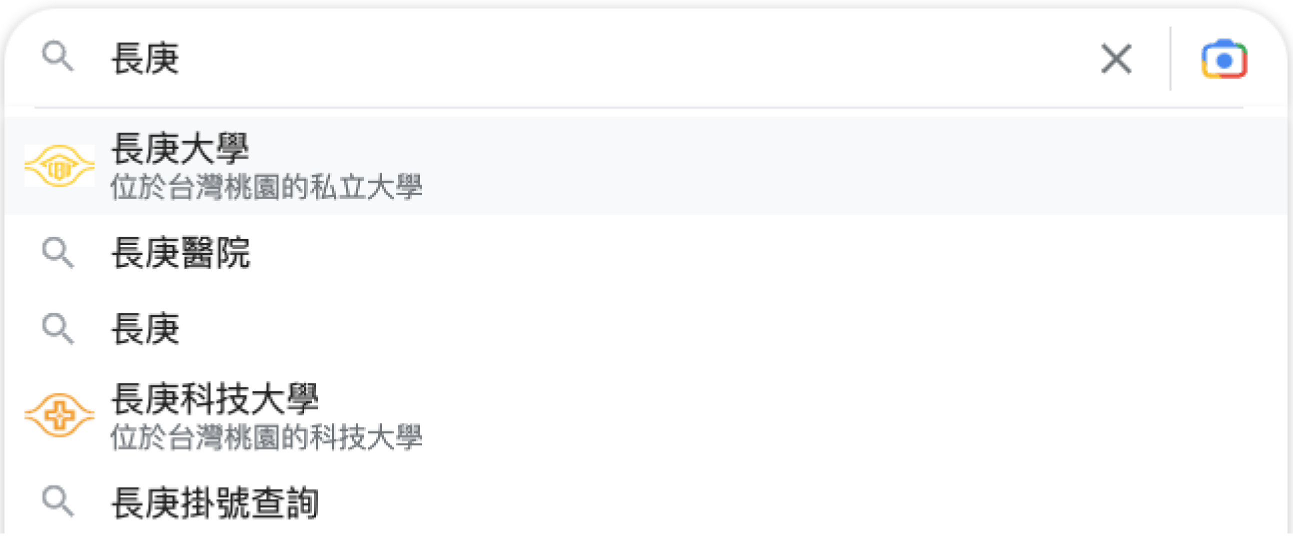
ementing a search bar with auto-completion or query suggestion. When the user enters a query, the search bar will automatically suggests common queries starting with the characters input by the user.


長庚

長庚大學
位於台灣桃園的私立大學

長庚醫院

長庚

長庚科技大學
位於台灣桃園的科技大學

長庚掛號查詢

Double-click (or enter) to edit

```
# YOUR CODE HERE!
# IMPLEMENTIG TRIE IN PYTHON

class TrieNode:

  def __init__(self, char):
    self.char = char
    self.children = {}
    self.finished = False
    self.counter = 0


class Trie(object):

  def __init__(self):
    self.root = TrieNode("")
```

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```
   for char in word:
    if char in node.children:
     node = node.children[char]
    else:
     new_node = TrieNode(char)
     node.children[char] = new_node
     node = new_node

   node.finished = True
   node.counter += 1


  def dfs(self, node, prefix):
   if node.finished:
          self.output.append((prefix + node.char, node.counter))

      for child in node.children.values():
          self.dfs(child, prefix + node.char)

    def query(self, x):
      self.output = []
      node = self.root

      for char in x:
        if char in node.children:
          node = node.children[char]
        else:
          return []

      self.dfs(node,x[:-1])
      return sorted(self.output,key = lambda x:x[1],reverse = True)



# # DO NOT MODIFY THE VARIABLES
obj = Trie()
obj.insert("長庚資工")
obj.insert("長大")
obj.insert("長庚")
obj.insert("長庚")
obj.insert("長庚大學")
obj.insert("長庚科技大學")

# # DO NOT MODIFY THE BELOW LINE!
# # THE RESULTS : [(words, count), (words, count)]
print(obj.query("長"))
# [('長庚', 2), ('長庚資工', 1), ('長庚大學', 1), ('長庚科技大學', 1), ('長大', 1)]

print(obj.query("長庚"))
# [('長庚', 2), ('長庚資工', 1), ('長庚大學', 1), ('長庚科技大學', 1)]
```

```
[('長庚', 2), ('長庚資工', 1), ('長庚大學', 1), ('長庚科技大學', 1), ('長大', 1)]
[('長庚', 2), ('長庚資工', 1), ('長庚大學', 1), ('長庚科技大學', 1)]
```

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