**Developers Institute**

# Python Course

## Exercises

### Exercise 1 – Files and Words

1. Create a new project for today's exercise. Copy the English word list file that we've been using into the project's root directory.
2. Create a function called **read_word_list()**, which should open the word list file, read its contents, and **return** it as a collection (list, set, dictionary, etc. - choose the best one).
3. Create a function called **search(text)**, which will return a collection of all the words from the word list which contain 'text'. For example, calling search('ame') should return a list that contains 'came', 'camel', 'caramel', etc.
4. Create a function called **save_search(text, results)**. This should save the search text and its results into a JSON file called last_search.json. The JSON should look like this:

```
{
    "search_text": "ame",
    "results": [
        "came",
        "camel",
        "caramel"
    ]
}
```

5. Create a function that displays a menu to the user until she chooses to exit (eg. by typing 'x'). The menu should contain the following options:
    1. Search for words → this should take some alphabetical input from the user (validate it! If there are numbers or special characters, print an error message.), search for any words that contain that text, and display the search text and the results to the user in a nicely-formatted message. It should also tell the user how many words were found. Here's an example:
    2. View last search results – this should display the same output for the last search. (This means that every time we search, we need to remember the search text and the results so that we can use them again later…)
    3. Exit.

```
You searched for "ame".
I found 3 words that match:
  1. came
  2. camel
  3. caramel
```

6. Extend your program – now, you should be able to view the last search results even when you exit and re-run the program! How can we achieve this? Correct – we will use the save_search function that we created earlier to write the search text and its matching results into a JSON file.
7. But writing the search to a JSON file is only half of the work. We will also need to read from the JSON file and store these results inside our running Python application, so that when the user asks to see the last search, we will be able to display it immediately. You will need to create new functions to do this.
8. (**BONUS**: Don't just remember the last search – remember all searches that were made. Adjust the menu to ask the user how many of the last searches he wants to see. If he chooses '5', for example, then only show the last 5. If there were fewer than 5 searches, then show all of them. This should work even when we exit and re-run the program.)

**Exercise 2**

1. Extend your program from Exercise 1, as follows:
2. Add a menu item to show statistics of the word list:
    1. The shortest word, and its length
    2. The longest word, and its length
    3. The amount of words in the list
    4. The average length per word
    5. (**BONUS**: how many words have double letters, eg. 'oo' or 'ee' or 'dd', etc.)