COMP301– Linux Operating Systems

Assignment 4
Sentence Generator

Due: Week 13 (Friday August 21st, 2020) @ Midnight

Value 15%

Basic Programming Practice with Python **Maximum Mark: 60**

Overview: Sentences in any language have a structure defined by a set of **grammar rules**. They also include a set of **words** from the vocabulary of the language. The vocabulary of a language like English consists of many thousands of words, and the grammar rules are quite complex. For the sake of simplicity, your program will **generate sentences** from a simplified subset of English. The vocabulary will consist of sample words from several parts of speech, including nouns, verbs, articles, and prepositions. From these words, you can build noun phrases, prepositional phrases, and verb phrases. From these constituent phrases, you can build sentences. For example, the sentence, "The girl hit the ball with the bat," contains three noun phrases, one verb phrase, and one prepositional phrase.

The rule for Noun phrase says that it is an **Article** followed by (+) a **Noun**. Thus, a possible noun phrase is "the bat." Note that some of the phrases are constituents of other phrases. Although this grammar is much simpler than the complete set of rules for English grammar, you should still be able to generate sentences with quite a bit of structure. The program will prompt the user for the number of sentences to generate.

Instructions:

1. **Task 1:** Modify the sentence-generator program (attached) so that it inputs its vocabulary from a set of **text files** at startup. (**20 Marks: Functionality**)
    a. The filenames are **nouns.txt**, **verbs.txt**, **articles.txt**, and **prepositions.txt**. (**Hint**: Define a single new function, **`getWords`**. This function should expect a **filename** as an argument. The function should open an input file with this name, define a temporary list, read words from the file, and add them to the list. The function should then convert the list to a tuple and return this tuple. Call the function with an actual filename to initialize each of the four variables for the vocabulary.)
2. **Task 2:** Make the following modifications to the original sentence-generator program: (**20 Marks: Functionality**)
    a. The prepositional phrase is **optional**. (It can appear with a certain **probability**.)

    b. A conjunction and a second independent clause are **optional**: The boy took a drink *and* the girl played baseball.
    c. An adjective is **optional**: The girl kicked the *red* ball with a *sore* foot.
    d. You should add new variables for the sets of **adjectives** and **conjunctions**.
3. Include **Internal Documentation** for your site **(5 Marks: Internal Documentation):**
    a. Ensure you include a **comment header** for your **Python files** that indicate: The **File name**, **Author's name**, **Student Number**, and **file description** (2 Marks: Internal Documentation).
    b. Ensure you include a **docstring** for all of your **python functions and classes** (1 Marks: Internal Documentation)
    c. Ensure all your code uses **contextual variable names** that help make the files human-readable (1 Marks: Internal Documentation).
    d. Ensure you include **inline comments** that describe your GUI Design and Functionality. **Note:** Please avoid "over-commenting" (1 Marks: Internal Documentation)
4. Share your files on **GitHub** to demonstrate Version Control Best Practices and push your site to a cloud host **(4 Marks: Version Control).**
    a. Your repository must include **your code** and be well structured (2 Marks: Version Control).
    b. Your repository must include **commits** that demonstrate the project being updated at various stages of development – each time a major change is implemented (2 Marks: Version Control).
5. Create a Short Video presentation on **YouTube** or another streaming provider. You must include a short **PowerPoint** (or Google Slides) Slide Deck that includes a **single slide** to start your video (10 Marks: Video)
    a. The **first** (and only) **Slide** of your Slide Deck must include a **current image** of you (no avatars allowed) that is displayed appropriately on the page. You must also include your **Full Name**, **Student ID**, the **Course Code**, **Course Name,** and your **Assignment** information. (2 Marks: video)
    b. You will **demonstrate** your code's functionality. You must show each script file working properly (2 Marks: Video)
    c. You will **describe** the code in your version of the **`generator.py`** file (2 Marks Video).
    d. Sound for your Video must at an appropriate level so that your voice may be clearly heard (2 Marks: Video).
    e. Your Short Video should run no more than 5 minutes (2 Marks: Video).

SUBMITTING YOUR WORK

Your submission should include:

1. A zip archive of your python project folder (rar files will not be accepted)
2. A link to your working GitHub repository.
3. A link to your Video Demo on YouTube (preferred)

Feature	Description	Marks
Functionality	App deliverables are met and all scripts are working as required. No errors, including submission of user inputs.	40
Internal Documentation	File header present, including site & student name & description. Functions and classes include headers describing functionality & scope. Inline comments and descriptive variable names included.	6
Version Control	GitHub commit history demonstrating regular updates.	4
Video Presentation	Your short video must demonstrate your site and describe your code	10
Total		**60**

This assignment is weighted **15%** of your total mark for this course.

Late submissions:

- 20% deducted for each day late.

External code (e.g. from the internet or other sources) can be used for student submissions within the following parameters:

1. The code source (i.e. where you got the code and who wrote it) must be cited in your internal documentation.
2. It encompasses a maximum of 10% of your code (any more will be considered cheating).
3. You must understand any code you use and include documentation (comments) around the code that explains its function.
4. You must get written approval from me via email.