Homework #1
CS 3060 Programming Languages, Fall 2022
Instructor: S. Roy

Ruby #1b

Due Date: Sep 2 (11:59 pm).

Total points: 45 points

Directions: For each of the following tasks you need to write a program. Then, you run the program and submit the code for each task. You need also submit a README file which lists sample input and sample output of all the programs. Check Gitlab `https://gitlab.com/sanroy/fa22-cs3060-hw` (or check Canvas) for details. The prefered process for completing this assignment should be as follows:

1. Fork the Repository "fa22-cs3060-hw" to a new Repository named "fa22-cs3060-hw" under your namespace (your gitlab username).
2. "git clone" the newly created repository on your local machine
3. Complete this assignment whose details are in hw1 sub-folder, committing changes to files in hw1.
4. Push all commits to your Gitlab repository
5. Add TA (with his gitlab username ayerrab) and Roy (gitlab username is sanroy) as a developer of your Gitlab repository

If for some reason Gitlab does not work for you, then you submbit the ruby code and README file on Canvas.
Tasks:

1. **(9 Points) program #1:** Ask the user to type 4 lines (e.g., before going to the next line the user will hit the 'Enter' key, etc.) on keyboard, and your program should save the lines, appended with line number, to a file named "myFile.txt". Then, your program also needs to process the file: for each line reports the total number of characters that are present.
   Below is an example.
   The user's input is as follows:
   ```
   abcd def 123 ghi
   abcd def 456 klmn
   abcd def 789 ghi
   klmn def 123 klmn
   ```
   Then, myFile.txt gets the following content:
   ```
   L1:abcd def 123 ghi
   L2:abcd def 456 klmn
   L3:abcd def 789 ghi
   L4:klmn def 123 klmn
   ```
   And, the output is as follows. L1: 20, L2: 21, L3: 20, L4: 21.
2. **(6 Points) program #2:** Ask the user to type the name of a file. Then, search the content of the file. If each line of the file contains "Python" or "Ruby", then print "The file is important"; otherwise, print "The file is worthless".
3. **(6 Points) program #3:** Write a function foo(n) to compute the value of x^x without using the exponent operator, (i.e., your need to use the loop syntax) whereas x is a positive integer. Test your program at least for 3 values of x such as 5, 6, and 7.
4. **(3 Points) program #4:** Print the string "The 7-th multiple of integer n is x" while substituting n by numbers from 5 to 10 and x by the value of $7n$.
5. **(6 Points) program #5:** Let the user pick a number (say x) between 5 and 25. Now your program simulates tossing a coin x times. In particular, your program can contain a loop and in each iteration it randomly

makes a choice: head (represented by string 'HEAD') or tail (represented by string 'TAIL'), and stores the outcome ('HEAD' or 'TAIL') in an array. After the iterations, traverse the array and count how many heads and tails were generated. Also, report the ratio of number of heads and number of tails.

6. **(15 Points) program #6:** Go to `http://www.textfiles.com/stories/` and check that this site [1] hosts multiple stories while each story is in a textfile. Download two textfiles of your choice, which have atleast 600 words, and save the files as `storyA.txt` and `storyB.txt`. Your program needs to read these files and processes them to collect some statistics. In particular, for each story x report the the number of unique words in x, the fourth-most frequent word in x and its frequency. Also, your program needs to report the number of unique words that are present in both the files.
   Hints: A template code is given to you. We use Array and Hash data structures as they are available in Ruby. You may design a regular expression to define a *word*.

[1] Disclaimer: we did not really check whether this website contains any improper story or language. If you find something improper, please ignore this site and use some other source