Data Structures and Algorithms with Python

Tutorial 3

1 Python practice exercises

In the first tutorial, you wrote a function to find the minimum of two variables

```
1 def max_float(a,b):
2     if a > b:
3         return a
4     else:
5         return b
```

Exercise. Modify this function to take as input three floats and find the maximum value among them.

Exercise. Write a function `printHistogram` that takes as input a list of integers and prints out a line of `x` for each input. So for example an input of `[2,5,3]` would print out

```
xx
xxxxx
xxx
```

Exercise. Write a function `longestWord` that takes as input a list of strings and returns the longest of them by its length.

Exercise. Write a function `reverseString` that takes as input a string and returns the reverse string. For example, the string "words" would be reversed as "sdrow".

Exercise. Write a function `reverseWordOrder` that takes as input a string with several words and returns the same words in the reverse order. For example, the string "to be or not to be" would be returned as "be to not or be to".

Exercise. Write a game called "guess the number" which first generates a random integer and then repeatedly asks the user to guess the value. If the guess is correct, the game terminates and prints out "Congratulations, you got it". Otherwise, it prints out a hint for the user: whether he guessed too high or too low. Use the module `import random` and its function `random.randint(0,20)` to generate the number to be guessed. Use `input` to get the user input.

Exercise. Write a recursive Python function that calculates the sum of the sequence

$$1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \dots$$

What is the base case of recursion? What is the recursive case?

Now repeat the same for

$$1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \dots$$

If you feel like you need even more practice, there are many useful resources for Python exercises: see below, or search online for "basic Python exercises", or ask us for pointers to specific things.

- http://www.practicepython.org/
- http://www.ling.gu.se/~lager/python_exercises.html
- http://www.w3resource.com/python-exercises/