Assignment 1-1  Installing Python
Visit the website [https://www.continuum.io/downloads](https://www.continuum.io/downloads) and download the Anaconda distribution for the Python 3.6 version. Make yourself familiar with the jupyter Python notebook which is included in the anaconda installation. If preferred, install also an IDE/editor of your choice. Please make sure to have to have a python setup up and running for the tutorial.

Assignment 1-2  Lists
Create a list which contains all numbers from 0 to 10.

Assignment 1-3  Loops and conditionals
Using the created list from assignment 1-1, print each element of the created list if it is an odd number, by using a loop and conditionals. Try using different type of loops.

Assignment 1-4  List Comprehensions
Now generate a list which contains all numbers from 0 to n which have been squared using list comprehensions.

Assignment 1-5  Functions
Write a function which takes an integer n. The function first creates a list of numbers from 0 to n. Then square each number of the list. Further each of the squared numbers is tested if it is odd. All odd numbers are then appended to a new list. The function returns the list of odd (squared) numbers.

Assignment 1-6  Assignments
Given a list $a = ['I','like','cookies']$ and another list $b = a$. Replace in the list $b$ the word 'cookies' with 'apples'. Finally print both lists ($a$ and $b$). What do you observe? What leads to the observed behavior?

Assignment 1-7  Shallow Copy I
Given a list $a = ['I','like','cookies']$ and another list which takes a shallow copy of $a$, $b = a[:]$. Like in the previous assignment 1-5, replace in the list $b$ the word 'cookies' with 'apples'. Finally print both lists ($a$ and $b$). What do you observe now?
Assignment 1-8  Shallow Copy II

Now we are given a list \( a = ['I', 'like', 'chocolate', 'cookies'] \) and another list which takes a shallow copy of \( a, b = a[:] \). Change now the word 'cookies' with 'apples' in \( b \). Now print again both lists \( (a \) and \( b) \). What do you observe? What leads to the observed behavior?

Assignment 1-9  Deep Copy

Like in the previous assignment, we are given a list \( a = ['I', 'like', 'chocolate', 'cookies'] \). Another list \( b = deepcopy(a) \) takes this time a deep copy from \( a \). Change now the word 'cookies' with 'apples' in \( b \). Print both lists \( (a \) and \( b) \). What do you observe now?

Hint: For deep copy, first type: \texttt{from copy import deepcopy}.

Assignment 1-10  Dictionaries I

Create a dictionary with \( n \) entries, where the keys are enumerated from 0 to \( n - 1 \) and the values are their corresponding keys squared. Use list comprehensions.

Example for expected result: \( n = 7; \{0 : 0, 1 : 1, 2 : 4, 3 : 9, 4 : 16, 5 : 25, 6 : 36\} \)

Assignment 1-11  Dictionaries II

Use the dictionary from the previous assignment. Write a list comprehension to get a list of all the keys of the dictionary.

Assignment 1-12  Lambda functions

Write a list comprehension which takes a number \( n \) and returns a list with even numbers, using a lambda function.

Assignment 1-13  map

First write a function which takes a length in inch and returns a length in cm. Given a list \( l \) with lengths in inches:

\( l = [4, 4.5, 5, 5.5, 6, 7] \)

Write a list comprehension which takes \( l \) and returns a list with all values converted to cm using \texttt{map}.

Assignment 1-14  filter

Write a list comprehension which filters the list \( l \) from the assignment above by returning only sizes between 4 and 6 inches.

Assignment 1-15  reduce

Write a list comprehension which reduces the list \( l \) by summing up all lengths.

Hint: for using the reduce function, you need to import it first by: \texttt{from functools import reduce}.

Literature:
Mark Pilgrim - Dive into python: \texttt{http://www.diveintopython3.net/}