Python course materials

# Iterators and Generators Homework - Solution

### Problem 1

Create a generator that generates the squares of numbers up to some number N.

def gensquares(N):  
 for i in range(N):  
 yield i\*\*2

for x in gensquares(10):  
 print(x)

0  
1  
4  
9  
16  
25  
36  
49  
64  
81

### Problem 2

Create a generator that yields “n” random numbers between a low and high number (that are inputs).Note: Use the random library. For example:

import random  
  
random.randint(1,10)

3

def rand\_num(low,high,n):  
   
 for i in range(n):  
 yield random.randint(low, high)

for num in rand\_num(1,10,12):  
 print(num)

3  
9  
6  
10  
8  
4  
5  
5  
5  
3  
5  
8

### Problem 3

Use the iter() function to convert the string below into an iterator:

s = 'hello'  
  
s = iter(s)  
  
print(next(s))

h

### Problem 4

Explain a use case for a generator using a yield statement where you would not want to use a normal function with a return statement.

**If the output has the potential of taking up a large amount of memory and you only intend to iterate through it, you would want to use a generator. (Multiple answers are acceptable here!)**

### Extra Credit!

Can you explain what *gencomp* is in the code below? (Note: We never covered this in lecture!)

my\_list = [1,2,3,4,5]  
  
gencomp = (item for item in my\_list if item > 3)  
  
for item in gencomp:  
 print(item)

4  
5

Hint: Google *generator comprehension*!

# Great Job!