

CSE 4256: Class 2: Lists - Due Wednesday, February 3

In the last homework, you read about Python lists. Now, we will look at list comprehensions.

Consider the following code:

```
squares = []
for i in range(1, 11):
    squares.append(i ** 2)
print(squares)
```

If we run the code above, we get [1, 4, 9, 16, 25, 36, 49, 64, 81, 100]

This code can be written more succinctly using a list comprehension:

```
squares = [i ** 2 for i in range(1, 11)]
print(squares)
```

In a list comprehension we use [and] to indicate that we are creating a list. We then start with the thing that we are putting in the list; in this case, `i ** 2`, followed by a for statement. In effect, we are inverting the longer way to write the code: compare the list comprehension above to the way we originally wrote the code.

We can also include if-statements in a list comprehension. In the example below, we only print out even squares.

```
squares = [i ** 2 for i in range(1, 11) if (i ** 2) % 2 == 0]
print(squares)
[4, 16, 36, 64, 100]
```

The code below creates a new list containing only the words in `s` that do not begin with a vowel.

```
s = ["This", "is", "a", "list", "of", "words"]
vowels = [word for word in s if word[0] not in "aeiou"]
```

Homework

- 1) Given a list of strings, create a list comprehension of a list of the strings, omitting any string length 4 or more in the original list.
- 2) Given a list of integers, create a list comprehension of those numbers squared and added to 10, omitting any of the resulting numbers that end in 5 or 6.

- 3) Write a method that returns the difference between the largest and smallest element in an unsorted list of integers containing at least two integers. The list will have at least two elements. Your method should make just one pass through the list and should not sort the list.
- 4) Write a method that, given a non-empty list of integers, return True if there is a place to split the list so that the sum of the numbers on one side is equal to the sum of the numbers on the other side, False otherwise.
- 5) Study the article at the following link: <https://realpython.com/python-strings/>. You can stop reading when you get to the section titled 'bytes Objects'. Next take the quiz at the bottom of the article. It is fine if you miss the two questions on bytes, but you should take it multiple times until you get every other question right. Take a snapshot of the certificate you get at the end of the quiz and paste the certificate into a Word document with your name, the class number, and the homework number (i.e. homework 2) at the top of the page.

What to Submit

Package your Python file and Word document into a zip file as you did for homework 1. Submit the zip file on Carmen.