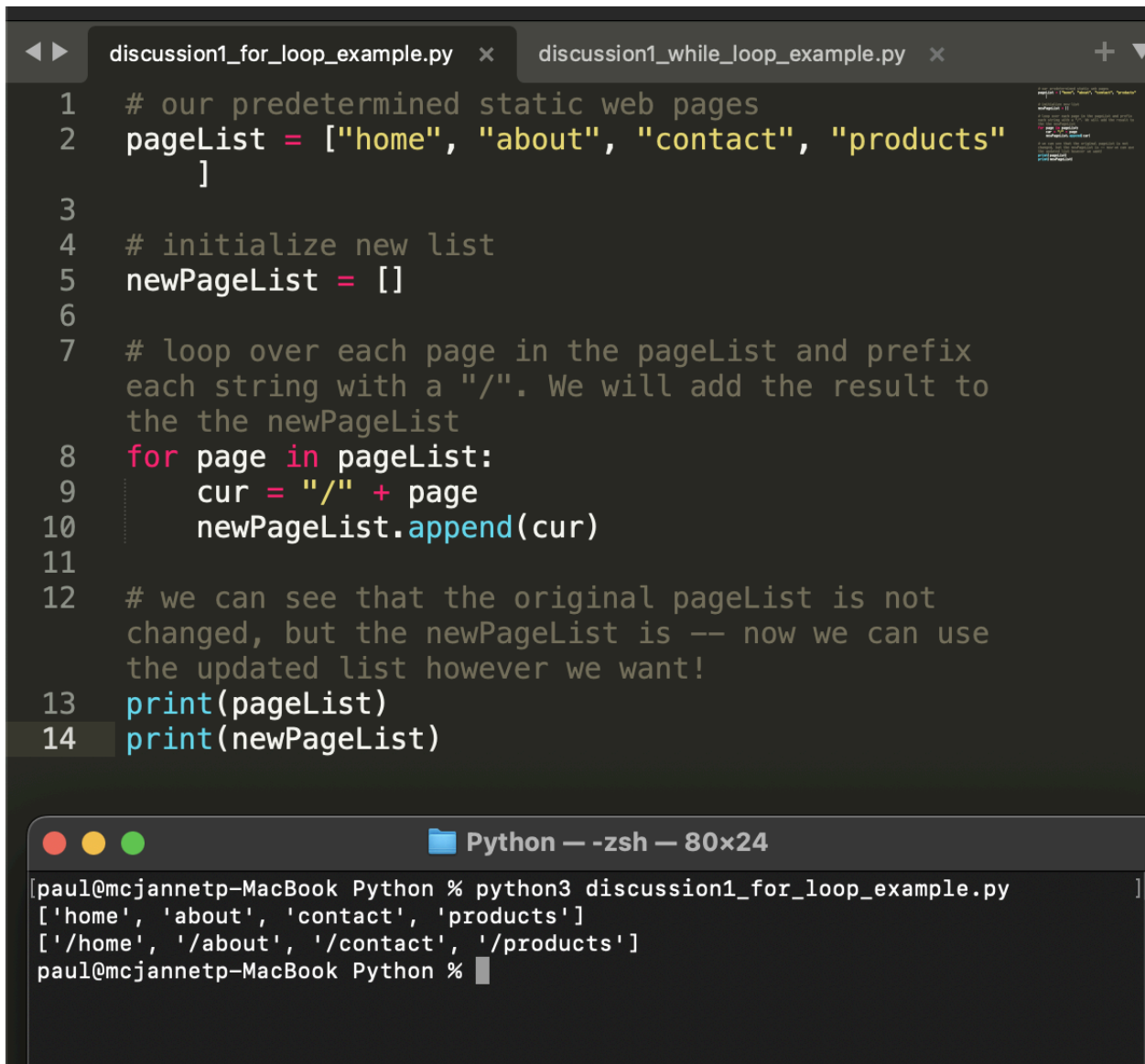


For Loops

For loops in Python are recommended when you know the number of times the loop should iterate for. Using the `range()` function can be useful to specify a “start” and “end” range for the loop, but it is also common to loop through a list and iterate over the indexes one at a time.

For example, let's say we are building a static webpage and we have a predetermined amount of pages. But, we quickly find out that none of our pages are working because they are missing a forward slash to route properly. If we intend to prefix all our pages with a forward slash, that might take time depending on how many there are. Luckily, we can use a for loop to handle the laborious repetition:



The image shows a code editor with two tabs: `discussion1_for_loop_example.py` and `discussion1_while_loop_example.py`. The first tab is active and contains the following Python code:

```
1 # our predetermined static web pages
2 pageList = ["home", "about", "contact", "products"]
3
4 # initialize new list
5 newList = []
6
7 # loop over each page in the pageList and prefix
  each string with a "/". We will add the result to
  the the newList
8 for page in pageList:
9     cur = "/" + page
10    newList.append(cur)
11
12 # we can see that the original pageList is not
  changed, but the newList is -- now we can use
  the updated list however we want!
13 print(pageList)
14 print(newList)
```

Below the code editor is a terminal window titled "Python — -zsh — 80x24". It shows the execution of the script:

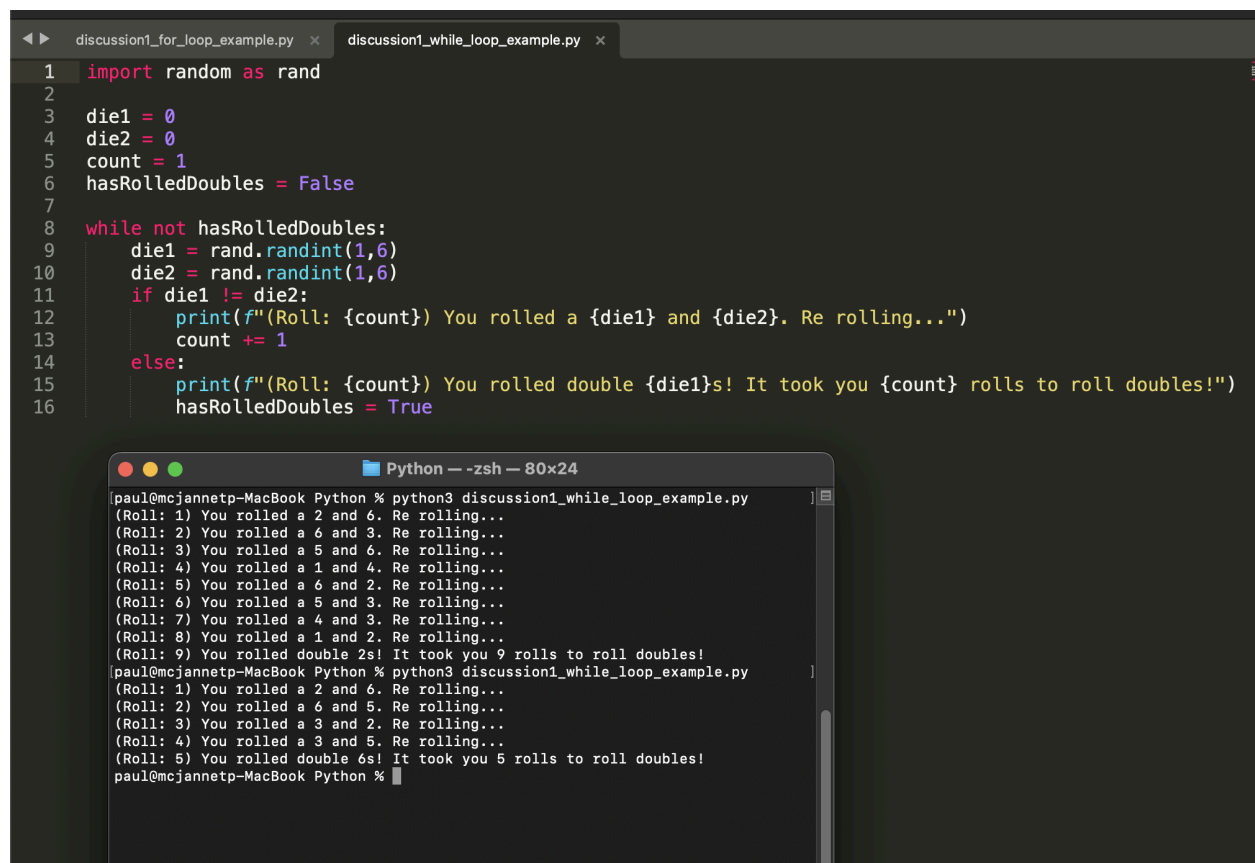
```
[paul@mcjannetp-MacBook Python % python3 discussion1_for_loop_example.py]
['home', 'about', 'contact', 'products']
['/home', '/about', '/contact', '/products']
paul@mcjannetp-MacBook Python %
```

As a result of using the for loop, we have a new list that will be useful in updating our routes.

While Loops

A while loop in Python is used when you are not sure how many iterations the loop should go for. Since this is the case, a while loop will only stop once a certain condition is met. More accurately: “while loops continuously execute code for as long as the given condition is true” (Coursera, 2023, February 4).

For example, say we want to know how many rolls it will take to roll doubles when we have two dice. We don’t know how many times it will take, so we need to use a while loop and check based on a given condition (if our conditional value initially starts False but becomes True once we do roll two of the same number, we can break the loop):



```
1 import random as rand
2
3 die1 = 0
4 die2 = 0
5 count = 1
6 hasRolledDoubles = False
7
8 while not hasRolledDoubles:
9     die1 = rand.randint(1,6)
10    die2 = rand.randint(1,6)
11    if die1 != die2:
12        print(f"(Roll: {count}) You rolled a {die1} and {die2}. Re rolling...")
13        count += 1
14    else:
15        print(f"(Roll: {count}) You rolled double {die1}s! It took you {count} rolls to roll doubles!")
16        hasRolledDoubles = True
```

```
Paul@mcjannetp-MacBook Python % python3 discussion1_while_loop_example.py
(Roll: 1) You rolled a 2 and 6. Re rolling...
(Roll: 2) You rolled a 6 and 3. Re rolling...
(Roll: 3) You rolled a 5 and 6. Re rolling...
(Roll: 4) You rolled a 1 and 4. Re rolling...
(Roll: 5) You rolled a 6 and 2. Re rolling...
(Roll: 6) You rolled a 5 and 3. Re rolling...
(Roll: 7) You rolled a 4 and 3. Re rolling...
(Roll: 8) You rolled a 1 and 2. Re rolling...
(Roll: 9) You rolled double 2s! It took you 9 rolls to roll doubles!
Paul@mcjannetp-MacBook Python % python3 discussion1_while_loop_example.py
(Roll: 1) You rolled a 2 and 6. Re rolling...
(Roll: 2) You rolled a 6 and 5. Re rolling...
(Roll: 3) You rolled a 3 and 2. Re rolling...
(Roll: 4) You rolled a 3 and 5. Re rolling...
(Roll: 5) You rolled double 6s! It took you 5 rolls to roll doubles!
Paul@mcjannetp-MacBook Python %
```

Since we used a while loop we were able to count how many times it took to roll a double, something that would not be possible with a for loop.

Coursera. (2023, February 4). *How to Write and Use Python While Loops*. Coursera.
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