

## Dictionaries Continued

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### Textbook

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## Dictionaries Continued



We can do a bunch of cool things with dictionaries.

### Dictionary Length

You can check to see how many items are in the dictionary. As with Python lists, when counting length we start counting at 1.

```
1 classmates = {  
2     "Billy": 8,  
3     "Vance": 15,  
4     "Alice": 10,  
5     "Lily": 6,  
6     "Xavier": 12  
7 }
```

```
8
9 print(len(classmates))
10
```

Try it!

This will print out `5`.



## Check if Key is in the Dictionary

You can check to see if the dictionary has a certain key.

```
1 classmates = {
2     "Billy": 8,
3     "Vance": 15,
4     "Alice": 10,
5     "Lily": 6,
6     "Xavier": 12
7 }
8
9 if "Vance" in classmates:
10     print("Vance is in your dictionary")
11
```

Try it!

This if statement checks to see if "Vance" is in the dictionary. If it is, it will print the statement `"Vance is in your dictionary"`.

You can also use `not in` to check your dictionary.

```

1 classmates = {
2     "Billy": 8,
3     "Vance": 15,
4     "Alice": 10,
5     "Lily": 6,
6     "Xavier": 12
7 }
8
9 if "Shelby" not in classmates:
10     print("Shelby is not in your dictionary")

```

Try it!

## Converting from a Python list to a dictionary

You can change a list to a dictionary by adding values to the list items. The items in the list become the keys of your dictionary.

```

1 garden = ["pumpkins", "squash", "corn", "tomatoes"]
2
3 garden_dictionary = dict.fromkeys(garden, "Harvested")
4
5 print(garden_dictionary)

```

Try it!

This will print out the following dictionary:

```

{'pumpkins': 'Harvested', 'squash': 'Harvested', 'corn': 'Harvested', 'tomatoes':
'Harvested'}

```

## Checkpoint

### Dictionaries Continued

1. Create a dictionary named `coins` .
2. Create **4** keys named `"pennies"`, `"nickels"`, `"dimes"`, `"quarters"`.
3. Assign the keys to the amount of each coin you have.
4. Add the key `silver dollar` to the dictionary.
5. Remove the key `pennies` from the dictionary by using the pop method.
6. Print the new dictionary.
7. Print the **length** of the dictionary.

### Requirements:

- Create a dictionary named `coins` .
- Create 4 keys named `"pennies"` , `"nickels"` , `"dimes"` , `"quarters"` .
- Add the key `"silver dollar"` to the dictionary.
- Remove the key `"pennies"` from the dictionary

- Print the new dictionary.
- Print the length of the dictionary.

## Questions (8)

### 1. What will this code do? `books.pop("Odyssey")`

MULTIPLE CHOICE

Choose the correct answer:

- A. It will add "Odyssey" to the dictionary named books
- B. It will take "Odyssey" out of the dictionary named books
- C. It will push "Odyssey" to the beginning of the dictionary named books
- D. It will push "Odyssey" to the end of the dictionary named books.

### 2. What will the following code do? `print(len(flavors))`

MULTIPLE CHOICE

Choose the correct answer:

- A. It will print out all the keys of the dictionary named flavors.
- B. It will print out all the values of the dictionary named flavors.
- C. It will print out the length of the dictionary named flavors.
- D. It will add the value "flavors" to the dictionary named flavors.

### 3. You are adding the key named "pineapple" to the dictionary named "fruit." Debug the following code:

DEBUG CODE

Code to Debug:

```
1 fruit = {  
2     "apple": 5,  
3     "orange": 7,  
4 }  
5  
6 fruit("pineapple") = 1  
7  
8 print(fruit)
```



**4. What will the following code print out?**

```
classmates = { "Billy": 8, "Vance": 15, "Alice": 10, "Lily": 6, "Xavier": 12 } print(len(classmates))
```

**Choose the correct answer:**

- A. 5
- B. {"Billy":8, "Vance": 15, "Alice":10, "Lily":6, "Xavier":12}
- C. 4
- D. Vance

**5. What does the following code do?**

```
if "Vance" in classmates: print("Vance is in your dictionary")
```

**Choose the correct answer:**

- A. Prints "Vance is in your dictionary" if Vance is not in the dictionary
- B. Prints "Vance is in your dictionary" if Vance is in the dictionary
- C. Removes "Vance" from the dictionary if present
- D. Checks if "Vance" is not in the dictionary

**6. How can you check if "Shelby" is not in the dictionary?****Choose the correct answer:**

- A. if "Shelby" in classmates:
- B. if "Shelby" == classmates:
- C. if "Shelby" not in classmates:
- D. if "Shelby" != classmates:

**7. The length of a dictionary is determined by:****Choose the correct answer:**

- A. The number of key/value pairs are in the dictionary
- B. The sum of all keys and values in the dictionary
- C. The number of characters in the dictionary's keys and values
- D. The number of characters in the dictionary's name

### 8. When counting the length of a dictionary, where do we start counting from?

Choose the correct answer:

- A. 0
- B. 1
- C. 2
- D. 10

## Challenges (5)

### 1. How Many?

How many items do you have?

Consider the following dictionary:

```
dictionary = { 1: "bicycle", 2: "soccer balls", 3: "piano books" }
```

1. Complete the dictionary up to the number **6** for your keys.
2. Create **3 inputs** to complete the dictionary for something that you have **4** of, something you have **5** of, and something you have **6** of.
3. Print the completed dictionary.

For example:

Inputs: `wheels` , `dice` , `siblings`

Output: `{1: 'bicycle', 2: 'soccer balls', 3: 'piano books', 4: 'wheels', 5: 'dice', 6: 'siblings'}`

Inputs: limbs, fingers, family members

Output: `{1: 'bicycle', 2: 'soccer balls', 3: 'piano books', 4: 'limbs', 5: 'fingers', 6: 'family members'}` "

## 2. Work Schedule

Let's say you have an awesome job where you work after school. You have some awesome coworkers and a really great boss. Plus, it's nice to earn some money.

1. Create a dictionary named `work`. Inside the dictionary, include all the weekdays as keys.
2. For each key, add a value for how many hours you worked that day. You remembered that you worked Saturday too.
3. Using what you learned in the lesson, **add** the key `"Saturday"` and a corresponding value to your dictionary.
4. You also remembered that you actually didn't work on Wednesday.
5. Using what you learned in the lesson, **pop off** the key `"Wednesday"` from your dictionary.
6. Inside a print statement, print out the **length of your dictionary**.
7. Using what you learned in the lesson, check to see if the key `"Friday"` is in your dictionary.

**For this challenge, use double quotes (") in your dictionary.**

### Requirements:

- Create a dictionary named `work` that has the weekdays as keys.
- Using what you learned in the lesson, add the key `"Saturday"` and a corresponding value to your dictionary.
- Using what you learned in the lesson, pop off the key `"Wednesday"` from your dictionary.
- Inside a print statement, print out the length of your dictionary.
- Using what you learned in the lesson, check to see if the key `"Friday"` is in your dictionary.

## 3. Word Counter

1. Write a program that uses a dictionary to track the number of times a word has appeared in the input.
2. For each word in the input, print the number of times that word has occurred already (including the number you are on).
3. Provide the current total of that word for each index value.

For example:

Input: `run run run hop run run jump jump run`

Output: `1 2 3 1 4 5 1 2 6`

Another example:

Input: `red blue green yellow red red red`

Output: `1 1 1 1 2 3 4`

Reminder: How to create a list from an `input: my_list = [str(n) for n in input().split()]`

## 4. Fruit Shopping List

You are about to make a delicious recipe that calls for a lot of fruit. You realize that you already have **5 apples, 7 bananas, and 3 strawberries**.

1. Write a program that will print out a dictionary of fruit you still need to buy from the store.
2. You will be adding the number inputs from the user into an empty dictionary. You will also practice adding the keys into the dictionary.
3. Create an empty dictionary named `shopping`.
4. Create **3 inputs**--one for number of apples, one for number of bananas, and one for number of strawberries.
5. The inputs should ask how many of each fruit are needed.
6. If the number of fruit needed is greater than the number of fruit you have, add the number they need to buy into the dictionary.
7. Add the fruit name as the key and the number needed as the value.

For example: the three inputs ask for how many apples, bananas, and strawberries are needed.

Inputs: `10, 12, 20`

Output: `{'apples': 5, 'bananas': 5, 'strawberries': 17}`

### Requirements:

- Create an empty dictionary named `shopping`.
- Three separate inputs asking how many of each fruit is needed.
- If the apples needed are greater than the number you have, add `"apples"` to the dictionary.
- If the bananas needed are greater than the number you have, add `"bananas"` to the dictionary.
- If the strawberries needed are greater than the number you have, add `"strawberries"` to the dictionary.
- Print the dictionary named `shopping` at the end.



## 5. Permission Slips

Your class is going on an awesome field trip! You were asked to create a program to keep track of people who have turned in their permission slips.

1. Create a program that takes in a list of names as an input.
2. The program will generate a dictionary with the names as keys and the string `"yes"` as values.
3. Print the dictionary.

For example:

Input: " Sam Jack Sally Veronica Matthew George "

Output: {'Sally': 'yes', 'Sam': 'yes', 'Jack': 'yes', 'Matthew': 'yes'}

Reminder of how to create a list from an input:

```
permission = [str(n) for n in input("Input a list of names separated by spaces").split()]
```

### AFTER FINISHING THE CHALLENGE

Stretch and Try These Variations!

These variations won't pass the autograder, but are interesting to explore. To pass the autograder, do the variation above.

Try adding the following conditions to your dictionary:

George did not turn his in, so if the name "George" appears in the dictionary, replace "yes" with "no".

Veronica dropped the class. So if her name appears in the dictionary, remove it before printing.

## Answer Keys & Solutions

### Checkpoint Solutions

#### Dictionaries Continued

```
1 coins = {  
2     "pennies" : 1,  
3     "nickels": 5,  
4     "dimes": 10,  
5     "quarters": 25,  
6 }  
7  
8 print(coins)  
9  
10 coins["silver dollar"] = 100;  
11  
12 coins.pop("pennies")  
13  
14 print(coins)  
15  
16 print(len(coins))
```

### Questions

#### 1. What will this code do? `books.pop("Odyssey")`

MULTIPLE CHOICE

Correct Answer:

- A. It will add "Odyssey" to the dictionary named books ✗ Incorrect
- B. It will take "Odyssey" out of the dictionary named books ✓ Correct
- C. It will push "Odyssey" to the beginning of the dictionary named books ✗ Incorrect
- D. It will push "Odyssey" to the end of the dictionary named books. ✗ Incorrect

#### Explanation:

`pop()` removes items

#### 2. What will the following code do? `print(len(flavors))`

MULTIPLE CHOICE

Correct Answer:

A. It will print out all the keys of the dictionary named flavors.

✗ Incorrect

B. It will print out all the values of the dictionary named flavors.

✗ Incorrect

C. It will print out the length of the dictionary named flavors.

✓ Correct

D. It will add the value "flavors" to the dictionary named flavors.

✗ Incorrect

#### Explanation:

`len()` is short for length

**3. You are adding the key named "pineapple" to the dictionary named "fruit." Debug the following code:**

#### DEBUG CODE

#### Incorrect Code:

```
1 fruit = {  
2     "apple": 5,  
3     "orange": 7,  
4 }  
5  
6 fruit("pineapple") = 1  
7  
8 print(fruit)
```

#### Correct Solution:

```
1 fruit = {  
2     "apple": 5,  
3     "orange": 7,  
4 }  
5  
6 fruit["pineapple"] = 1  
7  
8 print(fruit)
```

#### Explanation:

"pineapple" needs to be in square brackets

**4. What will the following code print out?**

MULTIPLE CHOICE

#### Correct Answer:

A. 5

✓ Correct

B. {"Billy":8, "Vance": 15, "Alice":10, "Lily":6, "Xavier":12}

✗ Incorrect

C. 4

✗ Incorrect

D. Vance

✗ Incorrect

**Explanation:**

len stands for length

## 5. What does the following code do?

MULTIPLE CHOICE

**Correct Answer:**

A. Prints "Vance is in your dictionary" if Vance is not in the dictionary

✗ Incorrect

B. Prints "Vance is in your dictionary" if Vance is in the dictionary

✓ Correct

C. Removes "Vance" from the dictionary if present

✗ Incorrect

D. Checks if "Vance" is not in the dictionary

✗ Incorrect

**Explanation:**

This code is checking to see if the value "Vance" is in the dictionary named classmates

## 6. How can you check if "Shelby" is not in the dictionary?

MULTIPLE CHOICE

**Correct Answer:**

A. if "Shelby" in classmates:

✗ Incorrect

B. if "Shelby" == classmates:

✗ Incorrect

C. if "Shelby" not in classmates:

✓ Correct

D. if "Shelby" != classmates:

✗ Incorrect

**Explanation:**

Use the words "not in"

## 7. The length of a dictionary is determined by:

MULTIPLE CHOICE

**Correct Answer:**

A. The number of key/value pairs are in the dictionary

✓ Correct

B. The sum of all keys and values in the dictionary

✗ Incorrect

C. The number of characters in the dictionary's keys and values

✗ Incorrect

D. The number of characters in the dictionary's name

✗ Incorrect

### Explanation:

Length finds the number of items in the dictionary.

## 8. When counting the length of a dictionary, where do we start counting from?

MULTIPLE CHOICE

### Correct Answer:

A. 0

✗ Incorrect

B. 1

✓ Correct

C. 2

✗ Incorrect

D. 10

✗ Incorrect

### Explanation:

Counting length starts counting at 1

## Challenges

### 1. How Many?

#### Solution:

```
1 dictionary = {
2     1: "bicycle",
3     2: "soccer balls",
4     3: "piano books"
5
6 }
7
8 dictionary[4] = input("What do you have 4 of?")
9 dictionary[5] = input("What do you have 5 of?")
10 dictionary[6] = input("What do you have 6 of?")
11
```

```
12 print(dictionary)
```

## 2. Work Schedule

Solution:

```
1 work = {
2
3     "Monday": 3,
4     "Tuesday": 4,
5     "Wednesday": 2,
6     "Thursday": 1,
7     "Friday": 1,
8
9 }
10
11 work["Saturday"] = 7
12
13 work.pop("Wednesday")
14
15 print(len(work))
16
17 if "Friday" in work:
18     print("Friday is in work")
19
20 print(work)
```

## 3. Word Counter

Solution:

```
1 text = [str(n) for n in input().split()]
2 times_seen = {}
3
4 for word in text:
5     if word not in times_seen:
6         times_seen[word] = 1
7     else:
8         times_seen[word] += 1
9     print(times_seen[word])
```

## 4. Fruit Shopping List

Solution:

```
1 shopping = {}
2
3 apples_need = int(input("How many apples do you need?"))
4
5 bananas_need = int(input("How many bananas do you need?"))
6
7 strawberries_need = int(input("How many strawberries do you need?"))
```



```
8
9 if apples_need > 5:
10     apples_buy = apples_need - 5
11     shopping["apples"] = apples_buy
12
13 if bananas_need > 7:
14     bananas_buy = bananas_need-7
15     shopping["bananas"] = bananas_buy
16
17 if strawberries_need > 3:
18     strawberries_buy = strawberries_need - 3
19     shopping["strawberries"] = strawberries_buy
20
21
22 print(shopping)
```

## 5. Permission Slips

Solution:

```
1 permission = [str(n) for n in input("Input a list of names separated by
spaces").split()]
2
3
4 permission_dictionary = dict.fromkeys(permission, "yes")
5
6
7 print(permission_dictionary)
```