

Looping Through a Dictionary

Textbook

Looping Through a Dictionary

We have already learned about looping through a list. Looping through a dictionary is done in a similar way.



Print out key names

```
1 classmates = {  
2     "Billy" : 8,  
3     "Vance" : 12,  
4     "Alice" : 10,  
5     "Eliza" : 15,  
6     "Xavier" : 6,  
7 }  
8  
9 for x in classmates:  
10     print(x)
```

Try it!

This will print out the [keys](#) in the dictionary. `Billy` `Vance` `Alice` `Eliza` `Xavier`

Print out the values

```
1 classmates = {  
2     "Billy" : 8,  
3     "Vance" : 12,  
4     "Alice" : 10,  
5     "Eliza" : 15,  
6     "Xavier" : 6,  
7 }  
8  
9 for x in classmates.values():  
10     print(x)
```

Try it!

This will print out the [values](#) in the dictionary. `8` , `12` , `10` , `15` , `6`



Print out both keys and values

```
1 classmates = {  
2     "Billy" : 8,  
3     "Vance" : 12,  
4     "Alice" : 10,  
5     "Eliza" : 15,  
6     "Xavier" : 6,  
7 }  
8  
9 for x,y in classmates.items():  
10     print(x,y)
```

Try it!

This will print out both the [keys](#) and [values](#) in the dictionary as tuple pairs.

```
Billy 8 Vance 12 Alice 10 Eliza 15 Xavier 6
```

Checkpoint

Looping through a Dictionary

1. Create a dictionary named `measurement` .
2. Inside the dictionary, create keys for `length` , `width` , and `depth` .
3. Add values to the keys for `length` , `width` , and `depth` .
4. Create a **loop** that loops through the dictionary and prints out the values.

Requirements:

- Create a dictionary named `measurement` .
- Inside the dictionary, create keys for `length` , `width` , and `depth` .
- Create a loop that loops through the dictionary and prints out the values.

Questions (8)

1. What will the following code print out?

MULTIPLE CHOICE

```
classmates = { "Billy" : 8, "Vance" : 12, "Alice" : 10, "Eliza" : 15, "Xavier" : 6, } for x in classmates: print(x)
```

Choose the correct answer:

- A. The keys
- B. The values
- C. Both the keys and the values
- D. You must specify what to print or it won't print

2. True or False: It is possible to print out both the keys and the values when looping through a dictionary.

MULTIPLE CHOICE

Choose the correct answer:

- A. True
- B. False

3. What will the following code print out?

```
animals = {"sheep": 8, "cows": 12, "chickens": 10} for x in animals: print(x)
```

Choose the correct answer:

- A. 8 12 10
- B. sheep cows chickens
- C. sheep: 8
- D. cows: 12
- E. chickens 10

4. In the following example, the term "octopus" is considered a what?

```
fish = {"squid": 12, "octopus": 2, "shark": 8} for x in fish: print(x)
```

Choose the correct answer:

- A. a value
- B. a key
- C. a loop
- D. a dictionary

5. What will be printed when the following code is executed?

```
classmates = {"Billy": 8, "Vance": 12, "Alice": 10, "Eliza": 15, "Xavier": 6} for x in classmates.values(): print(x)
```

Choose the correct answer:

- A. Billy Vance Alice Eliza Xavier
- B. 8 12 10 15 6
- C. "Billy" "Vance" "Alice" "Eliza" "Xavier"
- D. It will raise an error

6. How can you access the values in the "classmates" dictionary using a loop?**Choose the correct answer:**

- A. for x in values(classmates):
- B. for x in values(classmates.values()):
- C. for x in classmates.values():
- D. for x in classmates:

7. What will the following code print out from a dictionary named classmates?

```
for x, y in classmates.items(): print(x, y)
```

Choose the correct answer:

- A. Print the keys in the dictionary
- B. Print the values in the dictionary
- C. Print the items (keys and values) in the dictionary
- D. Print the length of the dictionary

8. True or False: Looping through a dictionary is similar to looping through a list.

Choose the correct answer:

- A. True
- B. False

Challenges (5)

1. Secret Beach Day

You are planning an awesome beach day. You know of a secret beach that would be perfect for a fun getaway. It's a small beach, so you want to make sure there will be enough room for the number of people who will be invited. You've invited groups of people.

The following dictionary shows a name of a friend and how many people that friend will bring.

```
group = { "Fred" : 12, "Jackson" : 15, "Sophie" : 20, "Amanda" : ?, "Jane" : ?, }
```

- Write a program that **loops through the dictionary** and will print out the total number of people who will attend.
- Notice that you don't know how many people Amanda and Jane will bring.
- Create inputs for these two values.

For example:

Inputs: 10 , 12

Output: 69

Another example:

Inputs: 1 , 1

Output: 49

2. Add it All Together

Consider the following dictionary.

```
group = { 3 : 10, 5 : 3, 10 : 6, 4 : 30, ? : ? }
```

1. Create a program that loops through to get the product (multiplication) of each key and its value.
2. Print out the total of all the products added together.
3. Notice the **question marks** in the dictionary.
4. Create inputs for the key and value.

For example:

Inputs: 2 , 10

Output: 245

Another example:

Inputs: 100 , 2

Output: 425

3. Boxes

You have a series of boxes that all have the same surface area on the bottom.

The surface area is 25.

Don't worry about square units, just get the number. You are trying to figure out how much total volume you have.

Consider the following dictionary:

```
group = { "box1" : 5, "box2" : 2, "box3" : 10, "box4" : 3, "box5" : ? }
```

The value is the height of each of the boxes.

1. Use a **for loop** to get a grand total for the volume you have with all the boxes.
2. Notice the question mark for the value of the key `box5` .
3. Create an input for this value.

For example:

Input: 2

Output: 550

Another example:

Input: 5

Output: 625

Hint: The volume of one box is 25 times 5.

4. Shoes

How many pairs of shoes do you have? Do you have different kinds for different seasons? Maybe you have different kinds for different activities?

Consider the following dictionary that stores the number of shoes a person has, with the `name` as the key and number of `shoes` as the value:

```
group = { "Sally" : 10, "Cameron" : 3, "Spencer" : 6, ? : ? }
```

Create a program that loops through this dictionary and, for **EACH item**, prints out the following string with the key and value concatenated into the string:

```
Sally has 10 pairs of shoes.
```

1. Use an input statement to ask for a `name`
2. Use another input statement to ask how many `shoes` that person has.
3. Create the dictionary, replacing the question marks with the `name` and number of `shoes` entered.
4. Declare a for-loop to print out the message for each person, using both their `name` and number of `shoes` .

For example:

Inputs: `Jim` , `4`

Output: `Sally has 10 pairs of shoes. Cameron has 3 pairs of shoes. Spencer has 6 pairs of shoes. Jim has 4 pairs of shoes.`

Another example:

Inputs: `Ron` , `1`

Output: `Sally has 10 pairs of shoes. Cameron has 3 pairs of shoes. Spencer has 6 pairs of shoes. Ron has 1 pairs of shoes.`

5. Family Banquet

You were asked to make the name cards for the big extended family banquet. Your grandmother has been looking forward to this event all year and wants everything to be just right. You were given a dictionary of the seat number and the name card that is supposed to go with it.

Here's an example of the dictionary you were given:

```
group = { 4: "Jared", 5: "McKann", 6: "Kyle", 7: "Summer", 8: "?", }
```

You were just about to print off the name cards when your grandma pointed out that they don't have last names on them! She really wants the full name on the name cards so they will look fancy.

1. Write a program that uses a for loop to attach the last name " **Nelson** " to each of the first names in the dictionary.
2. **Notice the question mark** for the person seated at number 8.
3. Create an input for that name.
4. Print the updated dictionary that includes the last names.

For example:

Input: **Sam**

Output: `{4: 'Jared Nelson', 5: 'McKann Nelson', 6: 'Kyle Nelson', 7: 'Summer Nelson', 8: 'Sam Nelson'}`

Another example:

Input: **Phil**

Output: `{4: 'Jared Nelson', 5: 'McKann Nelson', 6: 'Kyle Nelson', 7: 'Summer Nelson', 8: 'Phil Nelson'}`

Answer Keys & Solutions

Checkpoint Solutions

Looping through a Dictionary

```
1 measurement = {"length": 10, "width": 5, "depth": 3}
2
3 for side_measurement in measurement.values():
4     print(side_measurement)
```

Questions

1. What will the following code print out?

MULTIPLE CHOICE

Correct Answer:

- A. The keys ✓ Correct
- B. The values ✗ Incorrect
- C. Both the keys and the values ✗ Incorrect
- D. You must specify what to print or it won't print ✗ Incorrect

Explanation:

X stands for the keys in the dictionary

2. True or False: It is possible to print out both the keys and the values when looping through a dictionary.

MULTIPLE CHOICE

Correct Answer:

- A. True ✓ Correct
- B. False ✗ Incorrect

Explanation:

Loops can print either option in a dictionary or both.

3. What will the following code print out?

MULTIPLE CHOICE

Correct Answer:

- A. 8 12 10 ✗ Incorrect
- B. sheep cows chickens ✓ Correct
- C. sheep: 8 ✗ Incorrect
- D. cows: 12 ✗ Incorrect
- E. chickens 10 ✗ Incorrect

Explanation:

A for loop defaults to printing the keys of a dictionary

4. In the following example, the term "octopus" is considered a what?

MULTIPLE CHOICE

Correct Answer:

- A. a value ✗ Incorrect
- B. a key ✓ Correct
- C. a loop ✗ Incorrect
- D. a dictionary ✗ Incorrect

Explanation:

Keys come before values.

5. What will be printed when the following code is executed?

MULTIPLE CHOICE

Correct Answer:

- A. Billy Vance Alice Eliza Xavier ✗ Incorrect
- B. 8 12 10 15 6 ✓ Correct
- C. "Billy" "Vance" "Alice" "Eliza" "Xavier" ✗ Incorrect
- D. It will raise an error ✗ Incorrect

Explanation:

The values will be printed

6. How can you access the values in the "classmates" dictionary using a loop?

MULTIPLE CHOICE

Correct Answer:

- A. `for x in values(classmates):` ✗ Incorrect
- B. `for x in values(classmates.values()):` ✗ Incorrect
- C. `for x in classmates.values():` ✓ Correct
- D. `for x in classmates:` ✗ Incorrect

Explanation:

This is considered dot notation.

7. What will the following code print out from a dictionary named classmates?

MULTIPLE CHOICE

Correct Answer:

- A. Print the keys in the dictionary ✗ Incorrect
- B. Print the values in the dictionary ✗ Incorrect
- C. Print the items (keys and values) in the dictionary ✓ Correct
- D. Print the length of the dictionary ✗ Incorrect

Explanation:

The x and y represent the keys and values

8. True or False: Looping through a dictionary is similar to looping through a list.

MULTIPLE CHOICE

Correct Answer:

A. True

✓ Correct

B. False

✗ Incorrect

Explanation:

Both iterate through the items inside

Challenges

1. Secret Beach Day

Solution:

```
1 amanda_value = int(input("How many in Amanda's group?"))
2 jane_value = int(input("How many in Jane's group?"))
3
4
5 group = {
6     "Fred" : 12,
7     "Jackson" : 15,
8     "Sophie" : 20,
9     "Amanda" : amanda_value,
10    "Jane" : jane_value,
11 }
12
13 total = 0
14
15 for x in group.values():
16     total += x
17
18 print(total)
```

2. Add it All Together

Solution:

```
1 first = int(input("Pick a first number"))
2
3 second = int(input("Pick a second number"))
4
5 group = {
6     3 : 10,
7     5 : 3,
8     10 : 6,
9     4 : 30,
10    first : second
11 }
12
13 total = 0
14 for x,y in group.items():
15     total = total + (x * y)
```

```
16
17 print(total)
```

3. Boxes

Solution:

```
1 first = int(input("Pick the height of box5"))
2
3 group = {
4     "box1" : 5,
5     "box2" : 2,
6     "box3" : 10,
7     "box4" : 3,
8     "box5" : first
9 }
10
11 total_volume = 0
12
13 for x in group.values():
14     volume = 25 * x
15     total_volume = total_volume + volume
16
17 print(total_volume)
```

4. Shoes

Solution:

```
1 name = input("What is another name?")
2
3 shoes = int(input("How many shoes does " + name + " have?"))
4
5
6 group = {
7     "Sally" : 10,
8     "Cameron" : 3,
9     "Spencer" : 6,
10    name : shoes,
11 }
12
13 group_num = 4
14 for x,y in group.items():
15     print(x + " has " + str(y) + " pairs of shoes.")
```

5. Family Banquet

Solution:

```
1 name = input("What is another name?")
2
3 group = {
4     4: "Jared",
5     5: "McKann",
6     6: "Kyle",
7     7: "Summer",
8     8: name,
9 }
10
11 group_num = 4
12 for x in group.values():
13     group[group_num] = x + " Nelson"
14     group_num += 1
15
16 print(group)
```