

On Thursday, February 16th at 6:00AM EST, UTC-5, we will be conducting a brief database maintenance. The event should last about 5 minutes.



Bookmarks

- ▶ [Welcome to the edX Platform](#)
- ▶ [Entrance Survey](#)
- ▶ [Download Python and Get Motivated!](#)
- ▶ [Week 1: Python Basics](#)
- ▶ [Week 2: Simple Programs](#)
- ▶ [Week 3: Structured Types](#)
- ▼ [Week 4: Good Programming Practices](#)
- [7. Testing and Debugging](#)
Finger Exercises
- [8. Exceptions and Assertions](#)
Finger Exercises

Problem Set 4

Week 4: Good Programming Practices > Problem Set 4 > Problem 2 - Dealing with Hands

Problem 2 - Dealing with Hands

[Bookmark this page](#)

Problem 2 - Dealing with Hands

10.0 points possible (graded)


****Please read this problem entirely!!**** The majority of this problem consists of learning how to read code, which is an incredibly useful and important skill. At the end, you will implement a short function. Be sure to take your time on this problem - it may seem easy, but reading someone else's code can be challenging and this is an important exercise.

REPRESENTING HANDS

A **hand** is the set of letters held by a player during the game. The player is initially dealt a set of random letters. For example, the player could start out with the following hand: `a, q, l, m, u, i, l`. In our program, a hand will be represented as a dictionary: the keys are (lowercase) letters and the values are the number of times the particular letter is repeated in that hand. For example, the above hand would be represented as:

```
hand = {'a':1, 'q':1, 'l':2, 'm':1, 'u':1, 'i':1}
```

Notice how the repeated letter `'l'` is represented. Remember that with a dictionary, the usual way to access a value is `hand['a']`, where `'a'` is the key we want to find. However, this only works if the key is in the dictionary; otherwise, we get a `KeyError`. To avoid this, we can use the call `hand.get('a', 0)`. This is the "safe" way to access a value if we are not sure the key is in the dictionary. `d.get(key, default)` returns the value for `key` if `key` is in the dictionary `d`, else `default`. If `default` is not given, it returns `None`, so that this method never raises a `KeyError`. For example:

[Problem Set due Feb 23, 2017 15:30 PST](#) 

- ▶ [Midterm Exam](#)
- ▶ [Week 5: Object Oriented Programming](#)
- ▶ [Sandbox](#)

```
>>> hand['e']
Traceback (most recent call last):
  File "<stdin>", line 1, in <module>
KeyError: 'e'
>>> hand.get('e', 0)
0
```

CONVERTING WORDS INTO DICTIONARY REPRESENTATION

One useful function we've defined for you is `getFrequencyDict`, defined near the top of `ps4a.py`. When given a string of letters as an input, it returns a dictionary where the keys are letters and the values are the number of times that letter is represented in the input string. For example:

```
>>> getFrequencyDict("hello")
{'h': 1, 'e': 1, 'l': 2, 'o': 1}
```

As you can see, this is the same kind of dictionary we use to represent hands.

DISPLAYING A HAND

Given a hand represented as a dictionary, we want to display it in a user-friendly way. We have provided the implementation for this in the `displayHand` function. Take a few minutes right now to read through this function carefully and understand what it does and how it works.

GENERATING A RANDOM HAND

The hand a player is dealt is a set of letters chosen at random. We provide you with the implementation of a function that generates this random hand, `dealHand`. The function takes as input a positive integer `n`, and returns a new object, a hand containing `n` lowercase letters. Again, take a few minutes (right now!) to read through this function carefully and understand what it does and how it works.

REMOVING LETTERS FROM A HAND (YOU IMPLEMENT THIS)

The player starts with a hand, a set of letters. As the player spells out words, letters from this set are used up. For example, the player could start out with the following hand: `a, q, l, m, u, i, l`. The player could choose to spell the word `quail`. This would leave the following letters in the player's hand: `l, m`. Your task is to implement the

function `updateHand`, which takes in two inputs - a `hand` and a `word` (string). `updateHand` uses letters from the hand to spell the word, and then returns a copy of the `hand`, containing only the letters remaining. For example:

```
>>> hand = {'a':1, 'q':1, 'l':2, 'm':1, 'u':1, 'i':1}
>>> displayHand(hand) # Implemented for you
a q l l m u i
>>> hand = updateHand(hand, 'quail') # You implement this
function!
>>> hand
{'a':0, 'q':0, 'l':1, 'm':1, 'u':0, 'i':0}
>>> displayHand(hand)
l m
```

Implement the `updateHand` function. Make sure this function has no side effects: i.e., it must not mutate the hand passed in. Before pasting your function definition here, be sure you've passed the appropriate tests in `test_ps4a.py`.

Hints

Testing

Testing: Make sure the `test_updateHand()` tests pass. You will also want to test your implementation of `updateHand` with some reasonable inputs.

Copying Dictionaries

You may wish to review the `".copy"` method of Python dictionaries (review this and other Python dictionary methods here).

Your implementation of `updateHand` should be short (ours is 4 lines of code). It does not need to call any helper functions.

```
1 def updateHand(hand, word):
2     """
3     Assumes that 'hand' has all the letters in word.
4     In other words, this assumes that however many times
5     a letter appears in 'word', 'hand' has at least as
6     many of that letter in it.
7
8     Updates the hand: uses up the letters in the given word
9     and returns the new hand, without those letters in it.
10
```

```
11 Has no side effects: does not modify hand.  
12  
13 word: string  
14 hand: dictionary (string -> int)  
15 returns: dictionary (string -> int)
```

Press ESC then TAB or click outside of the code editor to exit

Unanswered

Submit

You have used 0 of 30 attempts

Problem 2 - Dealing with Hands

Topic: Problem Set 4 / Problem 2

Show Discussion

© All Rights Reserved



© 2012-2017 edX Inc. All rights reserved except where noted. EdX, Open edX and the edX and Open EdX logos are registered trademarks or trademarks of edX Inc.

POWERED BY
OPENedX®

