1. TRUE / FALSE QUESTIONS

_____The keys in a dictionary must be mutable objects.

_____The dictionary method `popitem` does not raise an exception if it is called on an empty dictionary.

_____The following statement creates an empty set:

```
myset = ()
```

_____A dictionary can include the same value several times but cannot include the same key several times.

_____The elements in a dictionary are stored in ascending order, by the keys of the key-value pairs.

_____If you try to retrieve a value from a dictionary using a nonexistent key, a `KeyError` exception is raised.

2. COMPLETION QUESTIONS: Fill in the blanks.

a) Each element in a(n) _____ has two parts: a key and a value.

b) The elements in a dictionary are not stored in a specific order. Therefore, a dictionary is not a(n) _____.

c) The _____ method returns a value associated with a specific key and, if found, removes that key-value pair from the dictionary.

d) The _____ method clears the contents of a dictionary.

e) The _____ method returns all of a dictionary's keys as a dictionary view.

MULTIPLE CHOICE QUESTIONS

3. The _____ dictionary method returns the value associated with a specified key. If the key is not found, it returns a default value.

a) `pop()`
b) `key()`
c) `value()`
d) `get()`

4. The _____ method returns all of a dictionary's keys and their associated values as a sequence of tuples.

a) `keys_values()`
b) `values()`
c) `items()`
d) `get()`

5. You can add one element to a set with this method.

a) `append`
b) `add`
c) `update`
d) `merge`

6. This set method removes an element, but does not raise an exception if the element is not found.

a) `remove`
b) `discard`
c) `delete`
d) `erase`

7. In a dictionary, you use a(n) _____ to locate a specific value.

a) Datum
b) Element
c) Item
d) Key

8. What will be the result of the following code?

```
ages = {'Aaron' : 6, 'Kelly' : 3, 'Abigail' : 1 }
value = ages['Brianna']
```

a) `False`
b) `-1`
c) `0`
d) `KeyError`

9. What is the number of the first index in a dictionary?

a) 0
b) 1
c) the size of the dictionary minus one
d) Dictionaries are not indexed by number.

10. What is the value of the variable phones after the following code executes?

```
phones = {'John' : '5555555', 'Julie' : '5557777'}
phones['John'] = 5556666'
```

a) `{'John' : '5555555', 'Julie' : '5557777'}`
b) `{'John' : '5556666', 'Julie' : '5557777'}`
c) `{'John' : '5556666'}`
d) This code is invalid.

11. Which method would you use to get all the elements in a dictionary returned as a list of tuples?

a) `list`
b) `items`
c) `pop`
d) `keys`

12. Which method would you use to get the value associated with a specific key and remove that key-value pair from the dictionary?

a) `list`
b) `items`
c) `pop`
d) `popitem`

13. What does the `get` method do if the specified key is not found in the dictionary?

a) It throws an exception.
b) It does nothing.
c) It returns a default value.
d) You cannot use the get method to specify a key.

14. What will be displayed after the following code executes? (Note: the order of the display of entries in a dictionary are not in a specific order.)

```
cities = {'GA' : 'Atlanta', 'NY' : 'Albany', 'CA' : 'San Diego'}
if 'CA' in cities:
          del cities['CA']
          cities['CA'] = 'Sacramento'
     print(cities)
```

a) `{'CA': 'Sacramento'}`
b) `['CA': 'Sacramento']`
c) `{'NY': 'Albany', 'GA': 'Atlanta'}`
d) `{'CA': 'Sacramento', 'NY': 'Albany', 'GA': 'Atlanta'}`

PROGRAMS

15. Morse code is a code where each letter of the English alphabet, each digit, and various punctuation characters are represented by a series of dots and dashes. Table below shows part of the code. Write a program that asks the user to enter a string, then converts that string to Morse code. Your program should make use of dictionaries to accomplish this task. Define a dictionary named `morse_code` which holds the character as key and the corresponding Morse code as value.

Character	Code	Character	Code	Character	Code	Character	Code
space	*space*	6	-....	G	--.	Q	--.-
comma	--..--	7	--...	H	....	R	.-.
period	.-.-.-	8	---..	I	..	S	...
question mark	..--..	9	----.	J	.---	T	-
0	-----	A	.-	K	-.-	U	..-
1	.----	B	-...	L	.-..	V	...-
2	..---	C	-.-.	M	--	W	.--
3	...--	D	-..	N	-.	X	-..-
4	....-	E	.	O	---	Y	-.-
5	.....	F	..-.	P	.--.	Z	--..

16. You will write a program that process a text file named `WorldSeriesWinners.txt`. It is available on Google Classroom. This file contains a chronological list of the World Series' winning teams from 1903 through 2009. The first line in the file is the name of the team that won in 1903, and the last line is the name of the team that won in 2009. (Note the World Series was not played in 1904 or 1994. There are entries in the file indicating this.) Write a program that reads this file and creates a dictionary in which the keys are the names of the teams, and each key's associated value is the number of times the team has won the World Series. The program should also create a dictionary in which the keys are the years, and each key's associated value is the name of the team that won that year. The program should prompt the user for a year in the range of 1903 through 2009. It should then display the name of the team that won the World Series that year, and the number of times that team has won the World Series.

17. (*Count occurrences of numbers*) Write a program that reads an unspecified number of integers and finds the ones that have the most occurrences. For example, if you enter **2 3 40 3 5 4 –3 3 3 2 0**, the number **3** occurs most often. If not one but several numbers have the most occurrences, all of them should be reported. For example, since **9** and **3** appear twice in the list **9 30 3 9 3 2 4**, both occurrences should be reported.

18. (Count consonants and vowels) Write a program that prompts the user to enter a text filename and displays the number of vowels and consonants in the file. Use a set to store the vowels **A, E, I, O,** and **U**.

19. Write a program that reads the contents of a text file. The program should create a dictionary in which the key-value pairs are described as follows:

• Key. The keys are the individual words found in the file.

• Values. Each value is a list that contains the line numbers in the file where the word (the key) is found.

For example, suppose the word "robot" is found in lines 7, 18, 94, and 138. The dictionary would contain an element in which the key was the string "robot", and the value was a list containing the numbers 7, 18, 94, and 138.

Once the dictionary is built, the program should create another text file, known as a word index, listing the contents of the dictionary. The word index file should contain an alphabetical listing of the words that are stored as keys in the dictionary, along with the line numbers where the words appear in the original file. Figure 19-1 shows an example of an original text file (`kennedy.txt`) and its index file (`index.txt`). This file is available at Google Classroom that can be used to test your program.

Figure 19-1 Example of original file and index.txt file