Review of 2-D Lists, Dictionaries and Graphics (Topics Since Midterm 2)

1. What would be the result of the following code?
   ```python
   ages = {'Aaron' : 6, 'Kelly' : 3, 'Abigail' : 1 }
   value = ages['Brianna']
   ```
   a. false
   b. -1
   c. 0
   d. KeyError

2. What is the number of the first index in a list dictionary?
   a. 0
   b. 2
   c. Dictionary is not indexed by number.
   d. Size of the dictionary minus one.

3. Which statement would you use to delete an existing key-value pair from a dictionary?
   a. del
   b. remove
   c. delete
   d. unpair

4. Which function would you use to get the number of elements in a dictionary?
   a. size
   b. length
   c. len
   d. invalid code

5. What does the get method do if the specified key is not found in the dictionary?
   a. Throw an exception
   b. Nothing
   c. Return a default value
   d. You do not specify a key for the get method

6. Assume `x = [[1, 2], [3, 4, 5], [5, 6, 5, 9]]`, what are `len(x[0])`, `len(x[1])`, and `len(x[2])`?
   a. 2, 3, and 3
   b. 2, 3, and 4
   c. 3, 3, and 3
   d. 3, 3, and 4
7. What will be displayed by the following code?

```python
matrix = [[1, 2, 3, 4],
          [4, 5, 6, 7],
          [8, 9, 10, 11],
          [12, 13, 14, 15]]

for i in range(0, 4):
    print(matrix[i][1], end = " ")
```

- a. 1 2 3 4
- b. 4 5 6 7
- c. 1 4 8 12
- d. 2 5 9 13
- e. 3 6 10 14

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

9. To determine whether a key is not included in a dictionary, or an element is not included in a set, you can use the ______________ operator.

10. What will be displayed by the following program?

```python
values = [[3, 4, 5, 1], [33, 6, 1, 2]]

v = values[0][0]
for row in range(0, len(values)):
    for column in range(0, len(values[row])):
        if v < values[row][column]:
            v = values[row][column]

print(v)
```

11. What will be displayed by the following code?

```python
m = [[1, 2, 3], [4, 5, 6], [7, 8, 9]]
print(m[0][0])
```
12. What is $0101_2$ in decimal?

13. What is $31_{10}$ in binary?

14. What is the runtime for the following sorting algorithm (constant, linear, or quadratic)?

\[
\begin{align*}
n & = \text{len}(L) \\
\text{for} \ pos \ \text{in} \ \text{range}(0, n-1): \\
\quad & \text{smallest_pos} = pos \\
\quad \text{for} \ test_pos \ \text{in} \ \text{range}(pos, n): \\
\quad & \quad \text{if} \ L[test_pos] < L[\text{smallest_pos}]: \\
\quad & \quad \quad \text{smallest_pos} = test_pos \\
\quad & \quad \text{swap}(L[pos], L[\text{smallest_pos}])
\end{align*}
\]

15. Write a function called `maxSumColumn` that takes in a 2-D list and returns the index and sum of the column with the maximum sum.
16. Write a function called `getClickRowCol` that takes in a parameter called `pixels` that corresponds to the number of pixels per grid size there are for both the row and columns, and the function waits for a click and then returns the row and column of the click location. (For example, if pixels was equal to 100 and x = 270 and y = 112, then row = 1 and column = 2.)

17. Write a function called `letterCount` that takes in a string and returns a dictionary with each letter in the string and the number of times that letter occurred in the string.