Exercise 6.6

(Objectives 6.8)

1) _____ is a simple but incomplete version of a function.

A. A stub
B. A function
C. A function developed using botton-up approach
D. A function developed using top-down approach

2) Assume you are given a program **CountLettersInList.py** that counts the occurrences of each letter in a list of characters.

a) Mark all function calls in red
b) Let us reverse the software development process, please draw a system design diagram by reading the program

Sample Run

```
The lowercase letters are:
l z b y s k f u s i t n k b m h h e e h
r g a c l p g j s c d y u o j y g q f o
d l o j c k v k p z t m q e u r s r h c
h c m d s q j r w k u y r g i x t w m l
x c o x v k g k n d d y z q z i g x j o
The occurrences of each letter are:
1 a 2 b 6 c 5 d 3 e 2 f 6 g 5 h 3 i 5 j
7 k 4 l 4 m 2 n 5 o 2 p 4 q 5 r 5 s 3 t
4 u 2 v 2 w 4 x 5 y 4 z
```

CountLettersInList.py

```
import RandomCharacter # Defined in Listing 6.9

def main():
    # Create a list of characters
    chars = createList()

    # Display the list
    print("The lowercase letters are:")
    displayList(chars)

    # Count the occurrences of each letter
    counts = countLetters(chars)

    # Display counts
    print("The occurrences of each letter are:")
    displayCounts(counts)

# Create a list of characters
def createList():
```

```
    # Create an empty list
    chars = []

    # Create lowercase letters randomly and add them to
the list
    for i in range(100):

chars.append(RandomCharacter.getRandomLowerCaseLetter())

    # Return the list
    return chars

# Display the list of characters
def displayList(chars):
    # Display the characters in the list 20 on each line
    for i in range(len(chars)):
        if (i + 1) % 20 == 0:
            print(chars[i])
        else:
            print(chars[i], end = ' ')

# Count the occurrences of each letter
def countLetters(chars):
    # Create a list of 26 integers with initial value 0
    counts = 26 * [0]

    # For each lowercase letter in the list, count it
    for i in range(len(chars)):
        counts[ord(chars[i]) - ord('a')] += 1

    return counts

# Display counts
def displayCounts(counts):
    for i in range(len(counts)):
        if (i + 1) % 10 == 0:
            print(counts[i], chr(i + ord('a')))
        else:
            print(counts[i], chr(i + ord('a')), end = '
')

main() # Call the main function
```