

## CS 121 – Review for test 2

Focus most of your attention on the recent units of the course: list, file I/O, dictionaries, and functions. Each of these units has a handout on the class Web site, where you can find many practice questions. You should not forget the fundamentals from the first part of the course (loops, if statements, strings, etc.) because we use them all the time! Here are some additional practice questions.

1. Given a list of strings that each represent words, how would we count how many words in the list have exactly 3 vowels?
2. Suppose L is a list of integer values. Write a loop that determines if there exist 3 numbers in a row that are the same.
3. Suppose Salary is a dictionary of employee salaries. The keys are strings (their names) and the values are real numbers.
  - a. Write a loop that finds the sum of all the salaries.
  - b. Write a loop that prints the salaries of all employees having “Bob” somewhere in their name.
4. Suppose L is a list of integer values. Show how we can find the sum of the even numbers in the list.
5. What is wrong with the following Python code? Show how you would fix it.

```
list = [ "Mon", "Tue", "Wed", "Thu", "Fri" ]
for i in list:
    print list[i]
```
6. What are the contents of the list M after the following Python code executes?

```
L = [ 1, 3, 5, 7, 9 ]
M = [ ]
for x in L:
    if x % 3 > 0:
        M.append(x+1)
```
7. Write a function that takes 2 list parameters, L and M. The function returns True if L and M have any elements in common, and False otherwise.
8. Using Python’s file I/O, show how we can find the number of lines in a text file.
9. Write Python code that will convert the following list of lists into a dictionary, where the keys are people’s names:

```
data = [{"Bob", 16}, {"Barbara", 23}, {"George", 5}, {"Claire", 8}]
```
10. Write a Python function called hasNegative() that takes a list parameter. The list will be of real numbers. The function will return True if the list contains at least one negative number, and False if no negative numbers exist.

11. Show how we can count the number of negative values in the last 20 elements in a list. Assume the list has more than 20 elements.

12. What does this Python code accomplish?

```
import re
a = re.compile("[ ,.:?!]")
```

13. What values are contained in lists A and B after this code executes?

```
A = [ 0 ] * 5
B = [ 3, 2, 4, 0, 1 ]
for i in B:
    A[B[i]] = i
```

14. Suppose we want our Python program to open an input file. Show how we can protect our program from abnormal termination in case the file does not exist. Be specific, but don't worry about the exact syntax. Just explain what is necessary.

15. Suppose temp is a list of real numbers representing the average temperatures for the 12 months of the year, January through December. Show how we can use Python to calculate the average temperature of just the 3 summer months, which are June, July and August.

16. Write a function round() that takes an integer number parameter, and returns this integer number rounded to the nearest 5.

17. Suppose L is a list of integer values. Explain how we can find the mode of this list. The mode means the value that occurs most often. Do not change the list. You may assume the mode exists, and it is unique.

18. Suppose we want to output the contents of a list L to a file. Assume that each element of L is a word. What is wrong with the following approach?

```
file = open("output.txt", "w")
for word in L:
    file.write(word)
file.close()
```

19. Show the contents of the object that gets created as a result of this statement:

```
a = set ("google")
```

20. Suppose x and y are sets where  $x = \{5, 6, 7\}$  and  $y = \{6, 7, 8, 9\}$ . What are in these sets?

- a.  $x \& y$
- b.  $x \wedge y$