CS 121 – Review for final exam

In addition to these questions, please look over all previous handouts of the course for practice.

1. What is the output of the following Python code?

```
s1 = "1"
s2 = s1 + "2" + s1
s3 = s2 + "3" + s2
s4 = s3 + "4" + s3
print(s4)
```

2. What is the output of this Python code?

```
print(1/2 + 1/2)
print(1//2 + 1//2)
```

3. Write a Python expression that obtains the fifth character of a string variable called `name`.

4. Using Python, how can we tell if a list of strings contains two strings that are identical?

5. Using Python, how can we tell if a positive integer
   a. Is an exact multiple of 7?
   b. Ends in 85?
   c. Has 3 digits?

6. If A = [1, 2, 3] and B = [2, 4, 6], then what are the contents of A + B?

7. What is the output of the following Python code?

```
s = "How far does Batman live from Waban?"
s2 = ""
for c in s:
    if c in "aeiou":
        s2 += "c"
print(s2)
```

8. If s is a string and `s == s.upper()` returns True, what can we assume about s?

9. Explain the aliasing problem with lists (and dictionaries) in Python.

10. What is the difference between these two types of tokenizing?

```
tok1 = re.compile(", ")
tok2 = re.compile("[, ]")
```

11. Write a function that takes three integer parameters x, y z. It should return the second largest number. You may assume the values are distinct.

12. How is a tuple different from a list in Python? For example, what can you do with one that you can't do with the other?

13. In Python, what are the operator symbols used on sets representing the operations of intersection, union, and exclusive or?

14. What is the output of the following code?

```
s = "BOS scored goal!   (Shorthanded)"
loc1 = s.find("(")
loc2 = s.find(")")
s2 = s[loc1 : loc2]
print(s2)
```

15. What is the output of the following program?

```
def fun(s):
    for i in range(0, len(s) - 1):
        if s[i] == s[i + 1]
            return i
    return -1

msg = "There is too much butter on those trays."
print(fun(msg))
```

16. When is it a good idea to use a triple quoted string in a Python program?

17. When is it better to use a while loop instead of a for loop?

18. Suppose we want to create a variable that stores the names of the host cities of the Olympics since 1896. Which data type would be more appropriate, a dictionary or a list? Why?

19. Python has a built-in function random.randint(a, b) that will return a random integer in the range a ≤ x ≤ b. Show how we can use this function to allow us to produce a random lowercase letter.

20. The following program intends to reads a list of words from a file, and checks to see if the user's word is in the list. What is wrong with the implementation? Show how to fix it.

```
file = open("words.txt", "r")
L = []
for line in file:
    # remove newline character from the word
    line = line[:-1]
    L.append(line)

    word = input("Enter the word you would like to look up:  ")
    if word in L:
        print("Yes, the word is in the list.")
    else:
        print("No, I can't find the word.")
file.close()
```

21. Bob is taking a biology class this term. The class is graded on a pass/fail basis, and to pass a student needs to earn a grade of at least 60 percent to pass. The course grade is the average of three test scores. Bob wants to know what minimum score he needs on the third test in order to pass the class. Write a function to help him. The function should take two parameters – the scores on the first two tests. The function should return the minimum score needed to achieve a 60% average on all three tests. Assume that all test scores are integers. For example, if a student makes a 59 and 60 on the first two exams, then the function should return 61.

22. Suppose you arrive home after a long day at work, and you notice that a power failure had occurred while you were away. You would like to know when the power failure took place. Based on the clocks in your house, it may be possible to figure it out! Assume that inside your house, you have two electric clocks. One is analog. When the power goes out the clock simply stops, and when

power resumes the clock continues counting time where it left off. The other clock is digital. When the power goes out it erases its time. When power comes back, it starts counting time over at 12:00.

Assuming that the power failure had started less than 12 hours ago, devise an algorithm that will determine when the power failure started and ended, given three pieces of information: the time that you arrive home, the time displayed on the analog clock, and the time displayed on the digital clock. You know the current time because your watch was unaffected by the power failure. As an example, what could you conclude if you arrive home at 7:00, the analog clock says 5:50 and the digital clock says 4:30?