Quiz 5

Name: ________________________________

Question 1 (25 points). The following code generates a string containing all of the numbers between 1 and the value of parameter n, separated by spaces; it does so iteratively. For instance, number_string(3) returns "1 2 3". Write a recursive implementation of this function.

```python
def number_string(n):
    acc = ""
    for i in range(1,n+1):
        if i > 1:
            acc += " 
        acc += str(i)
    return acc
```

Question 2 (25 points). The following recursive function is expected to add all of the numbers between 0 and the value of parameter n. For instance, sum_up_to(6) should return 21 (since $0 + 1 + 2 + 3 + 4 + 5 + 6 = 21$). This implementation contains two bugs. Identify them and explain how to correct them.

```python
def sum_up_to(n):
    if n > 1:
        return sum_up_to(n) + n
    elif n == 0:
        return 0
```
Question 3 (50 points). Consider the following class definition and then answer the questions below.

```python
class Student(object):
    def __init__(self, name):
        self.name = name
        self.courses = []
    def __str__(self):
        return "%s is taking: %s" % (self.name, self.courses)
    def register(self, course):
        self.courses.append(course)
    def unregister(self, course):
        self.courses.remove(course)
    def get_courses(self):
        return self.courses
```

(a) (15 points). If we have a Student object in variable student, we can call the register method by writing `student.register("CS21")`. The register method takes two parameters, but here we’ve only given one argument. Why is this okay? What value will each parameter of the register method have when `student.register("CS21")` is called?

(b) (15 points). Write a method `next_semester` to add to this class definition which would unregister the student from all of his or her courses.

c(c) (20 points). Write a test function which creates a student, registers that student for two courses, drops one course, and then tests to make sure that the student is only registered for one course.