6.00 Quiz 1, October 6, 2011		Name		
		Tune		
1.	/18			
2.	/15			
3.	/15	A.1. XX XX		
4.	/12	Athena User Name		
5.	/25			
6.	/12			
7.	/1	Recitation hour		
8.	/2			
Tot	al/100			
Thi	s quiz is open book and open notes, but	do not use a computer.		
	· -	h page , and your user name and the hour of Answer all questions in the boxes provided.		
1) .	Are each of the following True or False	(18 points)		
	1.1. "Glass box testing" and "black	box testing" mean the same thing.		
	1.2. If a program deals in only immu	utable types, aliasing is irrelevant.		
	1.3. When applied to the same data, run than a linear search.	a bisection search will never take longer to		
	1.4. There are algorithms that can be while loops.	e implemented with for loops but not with		
	1.5. When Newton-Raphson is used complexity is quadratic in the degre	to find a root of a polynomial, the order of e of the polynomial.		

Name

2) What does the following code print? Note that there is a print statement in implementation of f. (15 points)

```
def f(s, i, j):
    if s[i] != s[j]:
        s = s[j] + s[i+1:j-1] + s[i]
    if j - i > 2:
        print s
        return f(s, i+1, j-1)
    else:
        return s

L = 'abbca'
print f(L, 0, len(L) - 1)
```

Name

3) Consider the function definition of squareRootBi shown here. This code fails to meet its specification. 1) Give a value of x for which it will fail. 2) show how to correct the code so that it will not fail. (15 points)

```
def squareRootBi(x):
    """Assumes x is a float > 0
        Return y s.t. y <= 0 and y*y is within 0.01 of x"""
    epsilon = 0.01
    low = -x
    high = 0
    guess = low
    while abs(guess**2 - x) > epsilon:
        if guess**2 > x:
            low = guess
        else:
            high = guess
            guess = (low + high)/2.0
    return guess
```

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4) What does the following print? (12 points)

```
a = (1, 2, [])
b = a
c = {1:1, 2:2}
d = c
a = a + ('a',)
c[2] = 3
print a[0] == c[1]
print c == d
print b[-1]
print c.keys().sort()
```

5) Write a Python function that meets the following specification. (25 points)

def	g(L):
	"""assumes L is a non-empty list of ints
	return an x s.t. x is in L and no other int
	occurs more often than x in L."""

6) Consider the following code:

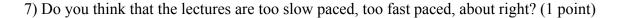
```
def f(x, s):
    if x == 0 or len(s) == 0:
        return max(x, len(s))
    for c in s:
        return f(x - 1, '')

x = 101
print f(x, str(x))
```

6.1. What does it print? (6 points)

6.2. Which of the following provides the tightest bound on the complexity of f? (6 points)

- $A. \circ (x)$
- $B. O(log_{10}(x))$
- C. O(len(s))
- D. 0(1)



Too slow 1 2 3 4 5 Too fast

8) Do you think that the problem sets are too short, too long, about right? (2 points)

Too short 1 2 3 4 5 Too long