CIS 210
Winter 2013 Midterm Key

Write your name at the top of each page before you begin. 1 point for each page.

1. [5 points] What does q1( ) print?

```python
def q1():
    x = 10
    y = 10
    while y > 0:
        y = y - 2
        x = x - 1
    print(x)
```

5

2. [5 points] What does q2( ) print?

```python
def area( x1, y1, x2, y2 ):
    """There should be a good docstring here,
    but it's an exam so I left it off.
    """
    width = x2 - x1
    if width < 0:
        width = 0 - width
    height = y2 - y1
    if height < 0:
        height = 0 - height
    a = width * height
    return a

def q2():
    ar = area(5, 5, 10, 10)
    print(ar)
```

25
3. [5 points] What does q3() print?

```python
def q3():
    lis = [7, 4, 7, 7, 3]
    occur_num(7, lis)
    for elem in lis:
        print(elem)
```

```python
def occur_num(pat, ar):
    count = 0
    for i in range(len(ar)):
        if ar[i] == pat:
            count += 1
            ar[i] = count
    return
```

1
2
3
3

4. [5 points] What does q4() print?

```python
def double(x):
    x = x + x
    return x

def q4():
    x = 10
    y = 3
    while y < x:
        y = double(y)
    print(y)
```

12
5. [12 points] An “even” number is an integer divisible by 2. Complete the following function to compute the sum of the even numbers in a list, consistent with the docstring comment.

```python
def sum_even(ar):
    """Sum of the even numbers in ar.
    Args:
        ar: a list of integers (not checked for validity)
    Returns:
        The sum of elements in ar that are divisible by two.
    Examples:
        sum_even([1, 2, 3, 4, 5]) == 2 + 4 == 6
        sum_even([3, 5, 7, 9]) == 0
        sum_even([]) == 0
    """
    # Your code here
    sum = 0
    for el in ar:
        if el % 2 == 0:
            sum += el
    return sum
```
6. [13 points] Complete the following function to remove runs of duplicate characters from a string, consistent with the docstring comment. For example, given the string “Havvvve fffuuun witttth the eexaaam”, it returns “Have fun with the exam”.

```python
def dedup(str):
    """Return copy of str except that any run of characters
    is reduced to a single occurrence.
    Args:
        str: A string that may contain runs of duplicate characters.
    Return:
        A new string, which is a copy of str except that every run
        of identical characters is replaced by a single occurrence.
    Examples:
        dedup("abccdeff fgh") => "abcdef fgh"
        dedup("abc") => "abc"
        dedup("aaaaaaaaa") => "a"
        dedup("") => ""
    """
    # Your code here
    result = ""
    prev = ""
    for char in str:
        if char != prev:
            result += char
            prev = char
    return result
```