Do not open this exam until you are told. Read these instructions:

1. This is a closed book exam. No calculators, notes, or other aids are allowed. If you have a question during the exam, please come to the front of the class.
2. You must turn in your exam immediately when time is called at the end.
3. Four problems, which add up to 43 points total. 60 minutes. Each question’s point value is indicated.
4. In order to be eligible for as much partial credit as possible, show all of your work for each problem, write legibly, and clearly indicate your answers. Credit cannot be given for illegible answers.

7. Fill in the following:

   NAME :

   G# :

   Lab section number: _______________
scratch
A. Trace through the following code using the scratch space below, and then write your answer in the box on the right-hand side. Then, TRANSFER YOUR ANSWER to the scantron sheet line-by-line. (11 points)

```python
#some lines in your answer may be blank
ctr = 0
things = [4, 5, 2.0, 0]
dict = {}

while ctr < len(things):
    dict[things[ctr]] = things[ctr] / 4
    ctr = ctr + 1

dict[0] = "cat"
keys = sorted(dict.keys())
ctr = 0
while ctr < len(keys):
    print dict[keys[ctr]]
    ctr = ctr + 1

if len(dict.values()) == 4:
    print "four"

ctr = 0
while ctr < len(things):
    if things[ctr] >= 2:
        print "two"
    elif things[ctr] >= 3:
        print "three"
    else:
        print "foo"
    ctr = ctr + 1
```

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COPY TO SCANTRON!

```
A1_____________________________________________
A2_____________________________________________
A3_____________________________________________
A4_____________________________________________
A5_____________________________________________
A6_____________________________________________
A7_____________________________________________
A8_____________________________________________
A9_____________________________________________
A10_____________________________________________
A11_____________________________________________
```
<table>
<thead>
<tr>
<th>Line</th>
<th>Output</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>A1</td>
<td>a. 0</td>
</tr>
<tr>
<td>2.</td>
<td>A2</td>
<td>a. 0</td>
</tr>
<tr>
<td>3.</td>
<td>A3</td>
<td>a. 0</td>
</tr>
<tr>
<td>4.</td>
<td>A4</td>
<td>a. 0</td>
</tr>
<tr>
<td>5.</td>
<td>A5</td>
<td>a. 0</td>
</tr>
<tr>
<td>6.</td>
<td>A6</td>
<td>a. two</td>
</tr>
<tr>
<td>7.</td>
<td>A7</td>
<td>a. two</td>
</tr>
<tr>
<td>8.</td>
<td>A8</td>
<td>a. two</td>
</tr>
<tr>
<td>9.</td>
<td>A9</td>
<td>a. two</td>
</tr>
<tr>
<td>10.</td>
<td>A10</td>
<td>a. two</td>
</tr>
<tr>
<td>11.</td>
<td>A11</td>
<td>a. two</td>
</tr>
</tbody>
</table>
B. Trace through the following code using the scratch space below, and then write your answer in the box on the right-hand side. Then, TRANSFER YOUR ANSWER to the scantron sheet line-by-line. (17 pts)

```python
#some lines in your answer
#may be blank

def func1():
    print "hi"

def foo(x):
    x = x + 1
    print (x + 1)
    return x

def func2(x,y,z):
    x = x + 1
    foo(x)
    y[0] = z
    print x
    print z
    z[1] = 9
    print y
    z = [4,6]
y = [2,3]
return z

x = 3
z = [1,x]
y = [8,7]
y = func2(2,y,z)
print y
z[1] = 3
y = [0,2]
q = [3,3]
print func2(x,y,q)
print x
print y
print z
print q
print func1()
```

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B1_____________________________________________
B2_____________________________________________
B3_____________________________________________
B4_____________________________________________
B5_____________________________________________
B6_____________________________________________
B7_____________________________________________
B8_____________________________________________
B9_____________________________________________
B10____________________________________________
B11____________________________________________
B12____________________________________________
B13____________________________________________
B14____________________________________________
B15____________________________________________
B16____________________________________________
B17_____________________________________________
scratch
12. Output for line B1:
a. 3  
b. 4  
c. 5  
d. 1  
e. 6  
13. Output for line B2:
a. 3  
b. 4  
c. 5  
d. 1  
e. 6  
14. Output for line B3:
a. [1,3]  
b. [1,4]  
c. [1,5]  
d. [1,6]  
e. [1,1]  
15. Output for line B4:
a. [8,7]  
b. [[1,9],7]  
c. [1,3]  
d. [2,3]  
e. [[1,3],7]  
16. Output for line B5:
a. [4,6]  
b. [[2,1],3]  
c. [8,3]  
d. [2,3]  
e. [[1,1],3]  
17. Output for line B6:
a. 5  
b. 6  
c. 7  
d. 8  
e. 9  
18. Output for line B7:
a. 4  
b. 5  
c. 6  
d. 7  
e. 8  
19. Output for line B8:
a. [1,3]  
b. [4,3]  
c. [3,3]  
d. [4,6]  
e. [1,1]  
20. Output for line B9:
a. [0,2]  
b. [2,3]  
c. [[3,9],2]  
d. [[1,9],2]  
e. [[4,9],2]  
21. Output for line B10:
a. [4,3]  
b. [1,9]  
c. [4,9]  
d. None  
e. [4,6]  
22. Output for line B11:
a. 3  
b. 4  
c. 5  
d. 7  
e. 6  
23. Output for line B12:
a. [0,2]  
b. [2,3]  
c. [[3,9],2]  
d. [[1,9],2]  
e. [[4,9],2]  
24. Output for line B13:
a. [1,3]  
b. [4,3]  
c. [3,3]  
d. [4,6]  
e. [1,1]  
25. Output for line B14:
a. [1,3]  
b. [4,3]  
c. [3,3]  
d. [4,6]  
e. [3,9]  
26. Output for line B15:
a.  
b. hi  
c. None  
27. Output for line B16:
a.  
b. hi  
c. None  
28. Output for line B17:
a.  
b. hi  
c. None
C. Write code (or pseudo code) for a function called `check52` that takes a list of integers as an argument, and decides if any of the two numbers in the list sum to 52. The function will return `True` or `False`, according to this property of the incoming list. A number may NOT be added to itself to get this sum; i.e. simply having 26 in the list once does NOT mean the function should return `True`. However, a number may be added to another number that happens to appear more than once in the list; for example, if the list contains 26 more than once, the function would return `True`.

You may not make any assumptions about the incoming list, other than it will be a list of integers of at least size two. *You may NOT use any built-in functions besides `len()`.*
scratch – you MUST turn in this sheet        Name: ____________________________