

Name: _____

1. (4 pts) Fill in the missing code for a linear search. Pay close attention, some variable names have changed compared to the review sheet. Use the correct variable name according to what is listed here.

```
items = [2,5,7,9,12,15,18,19,22,24]

desired_element = 23

# Linear search

position=0
while _____ and _____ != desired_element:

    _____

if _____
    print( "Not Found" )
else:
    print( "Found at position",i)
```

2. (1 pt) If a list has n elements, in the best case how many elements would the computer need to check before it found the desired element?
3. (1 pt) If a list has n elements, in the worst case how many elements would the computer need to check before it found the desired element?
4. (1 pt) If a list has n elements, how many elements need to be checked to determine that the desired element does not exist in the list?
5. (1 pt) If a list has n elements, what would the average number of elements be that the computer would need to check before it found the desired element?

6. (5 pts) Fill in the missing code for a binary search:

```
# Binary search
number_list = [2,5,7,9,12,15,18,19,22,24]

desired_element = 23

lower_bound = 0

upper_bound = _____
found = False

while _____ and found == False:

    middle_pos = (int) ( _____ )

    if _____
        lower_bound = middle_pos+1

    elif _____
        upper_bound = middle_pos

    else:
        found = True

if found:
    print( "Found at position",middle_pos)
else:
    print( "Not found." )
```

7. (1 pt) If a list has n elements, in the worst case how many elements would the computer need to check before it found the desired element?
8. (1 pt) Under what circumstances would a linear search work well, but a binary search would not work at all?

Given the following grid of numbers:

	0	1	2	3	4
0	0	0	0	0	0
1	0	0	0	0	0
2	0	1	0	0	0
3	0	0	0	0	2
4	0	0	0	0	0

9. (1 pt) Write the code that would print the cell that contains the number 1

10. (1 pt) Write code that would set the cell that contains a 2, to the number 3 instead.

11. (1 pt) Write code that would set each cell to the number 5.

12. (2 pts) Explain 2 points about the following line of code:

```
class Cat(Animal):
```

13. (2 pts) Explain 2 points about the following code:

```
def __init__(self):  
    Animal.__init__(self)
```

14. (1 pt) How does a programmer create his/her own library file in Python?

15. (3 pts) Write a function that takes two numbers and returns the largest.

16. (4 pts) Write code for a function that will take in an array and set each element to zero.

17. (4 pts) Write code that creates a class called Cat. Give it one attribute and one method.

18. (3 pts) Write code that creates an instance of Cat. Set the attribute and call the method.