HW6: Released Monday, week 7 and due Thursday, week 7

1. List any students you discussed with on this homework assignment:

These should still be your own answers, but it is ok to check answers and discuss your reasoning with your classmates.

Running code snippets from the homework is ok, but please take a moment to read through the code yourself first and figure out what you think it will do—you will learn how the code works much better if you think through it first before checking, *especially* if your initial assessment was wrong.

2. (16 points) For the following 4 questions, fill in this memory diagram with the current state of memory of the program (after the last line shown), showing values of any variables as well as drawing arrows for any pointers that exist. Make sure to label the location of the stack pointer.

Stack	Неар

```
a.
int x = 0;
int* y = new int(3);
x = *y;
b.
int* x = new int(4);
int* y = new int(5);
y = x;
C.
int* x = new int[4];
x[0] = 0;
x[1] = 1;
x[2] = 2;
x[3] = 3;
int* p = x;
*(p + 2) = 15;
p += 1;
*p = 20;
d.
int* x;
int z = 3;
if(z > 0){
      int* y = new int(60);
      x = y;
```

```
}
*x = 42;
```

3. (4 points) Given the following code, write a Cat struct that holds all of the variables used in the code, and would be able be allocated in the ways used in the code.

```
int main(){
    Cat c1;
    c1.name = "Mittens";
    c1.age = 3;
    c1.hair = "long";
    c1.color = "orange";
    Cat c2 = {"Gandalf", "short", "grey", 5};
    if(c1.age > c2.age){
        cout << c1.name << " is older." << endl;
    }
    else{
        cout << c2.name << " is older." << endl;
    }
    return 0;
}</pre>
```