1. Describe the algorithm you will use to find the room. Assume all the  
   information you have is the one given by the sign; you have no  
   knowledge of the floor plan [0.5 pts]

I would go with a simple modified approach taking inspiration from linear search. Linear search seems practical here since the amount of rooms is not a lot considering its not a ton of rooms shown on the sign. Depending on the room I’m looking for, I will start with the left if my room ranges from 100-130 and the right if it does not fall within that range. I would then start from whatever side that was chosen, comparing room numbers all around the floor until I find the room I seek.

1. How many ”steps” it will take to find room EY128? And what is a “step” in  
   this case? [0.25 pts

Assuming each room I reach is a step It would take 15 steps.

1. Is this a best-case scenario, worst-case scenario, or neither? [0.25 pts]

This is neither a best or worst case scenario.

1. With this particular sign and floor layout, explain what a worst-case or best-  
   case scenario would look like [0.5 pts]

The worst-case scenario would be that the room is EY130 in which I go left and traverse through 16 steps to find the room. The best-case scenario would be either EY138 or EY100 both of which I would have to either go to the first room on the right or left respectively. Both these scenarios are the best-case with 1 step taken.

1. Suppose after a few weeks in the term you memorize the layout of the floor.  
   How would you improve the algorithm to make it more efficient? [0.5 pts]

With knowledge of the floor plan. I would go modify the initial conditions of search of my modified linear search algorithm. If my floor ranges from 100-118 (inclusive) I will scan starting from the left as I know it increases in ascending order. If my floor falls into 118-138 (not inclusive of 118), then I would start scanning from the right. This would increase the efficiency of the algorithm by not getting misled by the sign.

Discuss the results. For each interpolating function, describe (1) the type of  
function, and (2) the parameters of the function. Are the results what you  
expected? Why? [0.5 pts]

The results are expected, since with binary search, every sequential search done using this algorithm halves the number of elements it has to search through, resulting in logarithmic function and shorter times. For linear search, it scans starting from the first index up until the end, taking a much longer time and therefore resulting in a linear function. This leaves the logarithmic function: **y =** **alog(x) + b**, with **a** being the rate at which the search time increases with the logarithm of the array size and **b** is the search time when the size of the array is at the base of the logarithm used. This leaves this function with a big O complexity of **O(log(n))**. As for the linear function **y =** **ax+b,** where **a** represents the rate at which the search time increases with the array size and **b** is the base search time for an array of size zero. This leaves the linear search algorithm with a big O complexity of **O(n)**