M3a

For the following Bin Packing problem, you may use any method you wish. In fact you are encouraged to pack the bins in the most efficient, sensible way you can find.

1. Suppose you had to pack items with the following sizes into bins of capacity 27: 23, 22, 21, . . . , 3, 2, 1. How many bins would be required? What would the most efficient packing look like? In other words, which items would each bin contain?

2. How many bins would be required if the list was: 23, 23, 22, 22, . . . , 2, 2, 1, 1?

3. How many bins if the list was: 23, 23, 23, 22, 22, 22, . . . , 2, 2, 2, 1, 1, 1?

4. Can you tell how many bins are required if you have n copies of the original list? (You have already done the cases where $n = 1$, $n = 2$, and $n = 3$.) Find any values of n for which the packing is "perfect", i.e., every bin used is filled to capacity.