PROBLEM:

Consider a system defined by $$y[n] = \sum_{k=8}^{20} b_k x[n-k]$$

Notice that the filter coefficients b_0, b_1, b_2, ..., b_7 are all zero.

(a) Suppose that the input $x[n]$ is non-zero only for $0 \leq n \leq 33$. Show that $y[n]$ is non-zero at most over a finite interval of the form $8 \leq n \leq P-1$ and determine P.

(b) Suppose that the input $x[n]$ is non-zero only for $100 \leq n \leq 200$. Show that $y[n]$ is non-zero at most over a finite interval of the form $N_3 \leq n \leq N_4$. Determine N_3 and N_4.

Hint: consult Figs. 5.5 and 5.6 in the book for the sliding window interpretation of the FIR filter.