

PROBLEM:

Consider a system defined by

$$y[n] = \sum_{k=0}^{13} b_k x[n - k]$$

- (a) What is the filter length?
- (b) 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 $0 \leq n \leq P - 1$ and determine P .
- (c) Suppose that the input $x[n]$ is non-zero only for $242 \leq n \leq 942$. 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: Draw a sketch similar to Fig. 5.5 to illustrate the zero regions of the output signal.