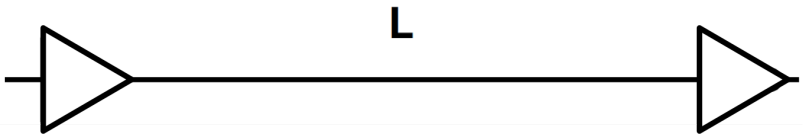
Assume:

- R_u=60KΩ per 1mm length of wire; C_u=0.16pF per 1mm length of wire
- $R_{wire} = L \times R_u$; $C_{wire} = L \times C_u$;
- R_0=25KΩ; C_0=0.01fF
- velocity saturated; $\gamma = C_{diff}/C_{gate} = 1$
- initial, minimum size buffer has $W_p = W_n = 1$

1. What is the delay of an unbuffered wire of length L=1mm driven and loaded by a minimum size buffer ($W_p = 1$, $W_n = 1$)? Draw the equivalent RC network and write a symbolic equation.



   - Symbolic Equation:

2. What is the delay of a length $L = 1mm$, when we add N evenly spaced buffers to the wire.

Wire of Length	**Delay (ns)**	**Number in 1mm**	**Total Delay for 1mm** (ns)
1mm		1	
0.5mm		2	
0.1mm		10	
0.01mm		100	
0.001mm		1000	

3. What is the delay of a length L, when we add N evenly spaced buffers to the wire.

   - Symbolic Equation:

4. How many buffers do we use to minimize delay?

   - Symbolic Equation:
   - Number of buffers to minimize delay on 1mm wire:
   - Delay at this buffer count:
   - Optimum segment length between buffers:

5. How should we size the buffers?

   - Symbolic Equation:
   - W to minimize delay:
   - Delay of 1mm wire at optimal buffer size: