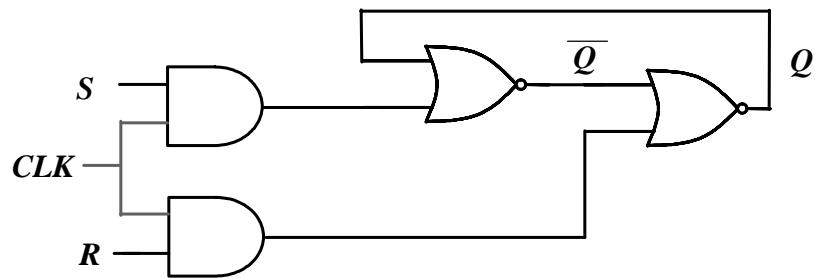


6.111 Spring 2005
In-class Exercise #1

Student Name:

TA:

Consider the following sequential building block.



(a) What type of memory element is it? (indicate if it is positive or negative, latch or register, and the functionality in words)

(b) Describe the functionality of the sequential block using a truth table.

(c) Construct a **D edge-triggered register** using the sequential block shown. You may add logic gates as necessary (show a logic diagram).

(d) For each of the following memory elements, specify the critical edge from which the setup time and hold time are computed. For each element below, circle one edge.

- | | | |
|--------------------------------------|---------------------|---------------------|
| (1) positive edge-triggered register | positive clock edge | negative clock edge |
| (2) negative edge-triggered register | positive clock edge | negative clock edge |
| (3) positive latch | positive clock edge | negative clock edge |
| (4) negative latch | positive clock edge | negative clock edge |