

CSIE 2344: Discussion (Unit 12)

1 Counter Design

Design a 3-bit counter which counts CBA in the sequence: 001, 100, 101, 111, 110, 010, 011, and repeats.

1. Use D flip-flops.
2. Use T flip-flops.
3. Use S-R flip-flops.
4. Use J-K flip-flops.
5. What will happen if the counter is started in state 000?

$\begin{array}{c} C \ 0 \ 1 \\ \diagdown \ BA \\ 00 \\ 01 \\ 11 \\ 10 \end{array}$ <table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> </table> C^+									$\begin{array}{c} C \ 0 \ 1 \\ \diagdown \ BA \\ 00 \\ 01 \\ 11 \\ 10 \end{array}$ <table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> </table> D_C									$\begin{array}{c} C \ 0 \ 1 \\ \diagdown \ BA \\ 00 \\ 01 \\ 11 \\ 10 \end{array}$ <table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> </table> T_C									$\begin{array}{c} C \ 0 \ 1 \\ \diagdown \ BA \\ 00 \\ 01 \\ 11 \\ 10 \end{array}$ <table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> </table> S_C									$\begin{array}{c} C \ 0 \ 1 \\ \diagdown \ BA \\ 00 \\ 01 \\ 11 \\ 10 \end{array}$ <table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> </table> R_C									$\begin{array}{c} C \ 0 \ 1 \\ \diagdown \ BA \\ 00 \\ 01 \\ 11 \\ 10 \end{array}$ <table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> </table> J_C									$\begin{array}{c} C \ 0 \ 1 \\ \diagdown \ BA \\ 00 \\ 01 \\ 11 \\ 10 \end{array}$ <table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> </table> K_C								
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