

Lab 8

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Due: 23 April 2021

1 Assignment

1. **(50 points)** Implement a sequence detector that will find overlapping sequences of 1101. The output, **found** shall assert following receipt of the sequence (non-coincident). You may use any implementation style you choose. Your implementation shall conform to the following requirements.
 - The module name shall be **lab8_seq_1101**.
 - The module shall have an active low synchronous reset input called **rst_n**.
 - The module shall have a free-running clock input called **clock**.
 - The module shall accept on the rising clock edge from an input called **d_in**.
 - The module shall provide a single bit output called **found** following identification of the sequence.
2. **(50 points)** Implement a sequence detector that will find non-overlapping sequences of 101. The output, **found**, shall assert following receipt of the sequence. The implementation shall be shift register based. Your implementation shall conform to the following requirements.
 - The module name shall be **lab8_seq_101**.
 - The module shall have an active low synchronous reset input called **rst_n**.
 - The module shall have a free-running clock input called **clock**.
 - The module shall accept on the rising clock edge from an input called **d_in**.

- The module shall provide a single bit output called **found** following identification of the sequence.
- The implementation shall be shift register based.
- The implementation shall find non-overlapping sequences. E.g. in the pattern 101101, two instances will be found while in 10101 only the first will be found.

NOTE: This detector is shift register based and detects non-overlapping sequences. This means that you'll need to determine how to clear your shift register when you receive a pattern.