NPTEL Workshop: Experiment 9 (Bonus)

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1 Problem statement

In this experiment, you will design a string detector using a Mealy type FSM which outputs '1' when input sequence of letters given thus far contains the following sub-sequences:
students
bomb
terror
knife
gun
in a string of letters.

For this experiment, letter 'a' is encoded as "00001", 'b' is encoded as "00010" and so on.

Note: Consider characters in this problem as case insensitive.

2 Design Specification.

- Input: 5-bit input signal encodes blank-space and 26 lower-case characters (from a to z and where a = 1 to z = 26, and blank-space = 0) , Reset, Clock.

- In this problem Reset is synchronous.

- TRACEFILE format $< 5\ bit\ input >< Reset >< Clock >\quad < Output >\quad < Maskbit >$

- Output: 1-bit output

3 Lab Task

- Describe behavioral model of the string detector Mealy type FSM in VHDL.

- Perform RTL and Gate-level simulation using the provided testbench and tracefile.

- Demonstrate the simulations to your TA.

- Perform scan-chain and demonstrate to your TA.