NPTEL Workshop: Experiment 3

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Instructions:

1. Use structural modelling for this experiment; means instantiate components and use port map to connect those components.
2. Perform RTL and Gate-level simulation using the provided testbench and tracefile.
3. Demonstrate the simulations to your TA.
4. Perform this experiment on Krypton board.

Problem Statement: Scrabble

1. Scrabble is an extremely popular word game where players score points by placing tiles on a board that make correct words. Each letter used in the word has some points attached to it, based on how frequently it occurs in the English language. For example, the most frequent alphabet E has only 1 point whereas the least frequent letter Z has 10 points.

   The modified scoring system is as below.

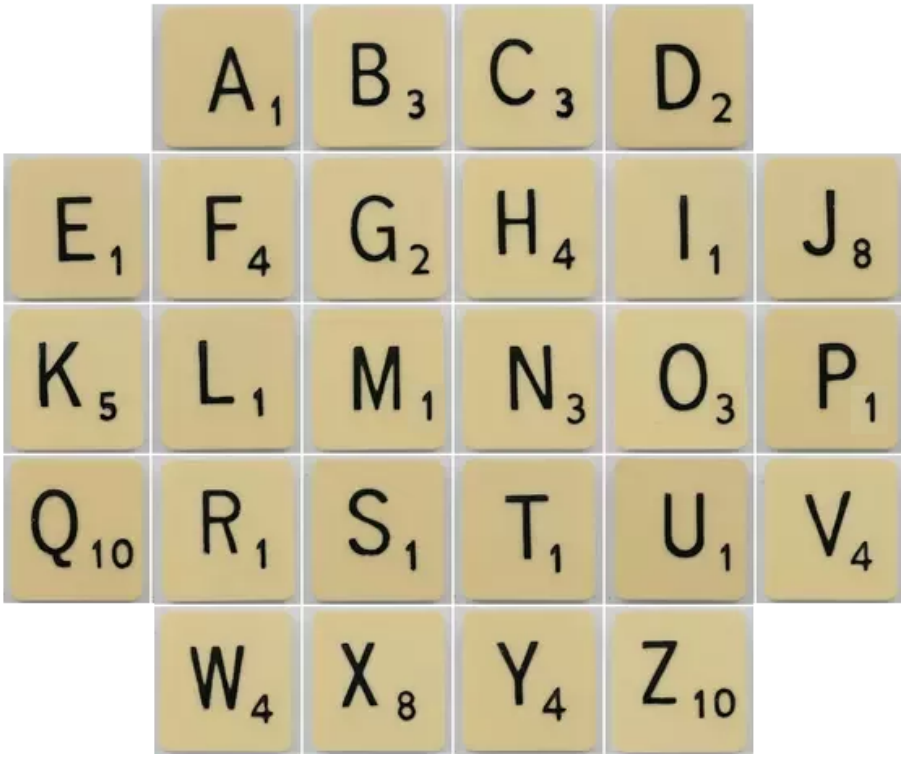

Figure 1: Score Board

2. Let us assume that we have only the first 16 letters of the English alphabets (i.e. A to P) Let 0000 represent A, 0001 represent B and so on.
3. Design a system that gives output as '1' when a given alphabet has 3 points, and '0' in other cases.
4. Verify working of your design by performing RTL and Gate-level simulation. Show the results to your TA.
5. Simulate the above designs in Modelsim and validate its functionality using the given Tracefile.
   NOTE: TRACEFILE format $< X3\,X2\,X1\,X0 >< Y >\ 1$

6. Perform the experiment in the Krypton board. Inputs can be given using four switches corresponding to binary representation of alphabets (for example to give input B, four switch combination will be 0001). One LED will turn ON when given input alphabet has three points.