

## Lab 10: Electronic Organ

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### Objective

- ✓ Implement the electronic organ with different sound tones.

### Prerequisite

- ✓ Fundamentals of logic gates.
- ✓ Keypad control
- ✓ Frequency design of different tones
- ✓ Logic modeling in Verilog HDL.

### Experiments

- 1 Play the 14 sounds repeatedly based on the sound table. Every sound is played for one second.
- 2 Electronic Organ
  - 2.1 Integrate the keypad as the keyboard of the electronic organ. Keys c, d, e, f, g, a, b, C, D, E, F, G, A, B (two octaves from mid-Do) represent the sounds from low to high frequencies.
  - 2.2 Display your playing sound (Do, Re, Mi, Fa, So, La, Si) in the 7-segment LED
- 3 (Bonus) Playback double tones by separate left and right channels. If you turn one DIP switch off, the electronic organ playback single tone when you press keyboard (as in Prob. 2). If you turn DIP switch on, left (right) channels play Do(Mi), Re(Fa), Mi(So), Fa(La), So(Si) when you press the keyboard.