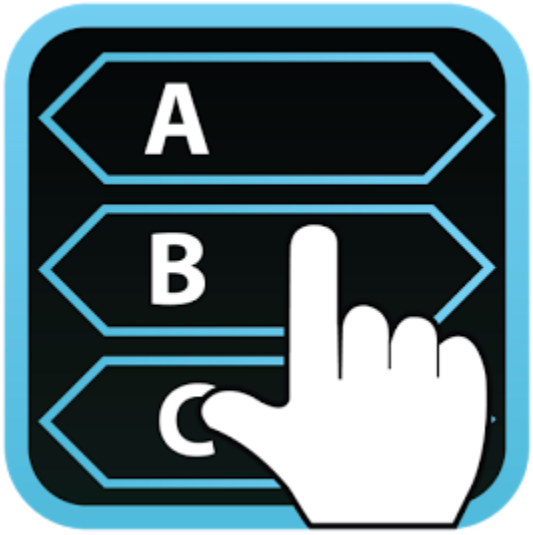
FIRST RESPONSE DETECTOR CIRCUIT



By:

Palak Singhal 16CO129

Sharanya Kamath 16CO140

Submitted to:

Prof. B. R. Chandavarkar

Asst. Prof., Computer Engg., Dept

Date:

6-10-2017

Idea:

To build a First Response Detector circuit using digital components.

Uses:

In first response rounds of quiz contests, the question is thrown open to all the teams. The person who knows the answer hits his switch first and then answers the question. Sometimes two or more players hit the switch almost simultaneously and it is very difficult to detect which of them has pressed the switch first.
This project is an electronic first response detector that is affordable by the colleges and even individuals. This project is useful for a 4-team quiz contest, although it can be modified for more number of teams.

Working:

When a contestant presses his switch, the corresponding output of latch IC2 (7475) changes its logic state from 1 to 0. The combinational circuitry comprising dual 4-input NAND gates of IC3 (7420) locks out subsequent entries by producing the appropriate latch-disable signal.

Priority encoder IC4 (74147) encodes the active-low input condition into the corresponding binary coded decimal (BCD) number output. The outputs of IC4 after inversion by inverter gates inside hex inverter 74LS04 (IC5) are coupled to BCDto- 7-segment decoder/display driver IC6 (7447). The output of IC6 drives common anode 7-segment LED display (DIS.1, FND507 or LT542).

Components:

- IC 7805- Voltage regulator
- IC 7420 – Dual 4 input NAND gate
- IC 74147- Priority Encoder
- IC 74LS04- Hex Inverter
- IC 74LS47-BCD to 7 segment decoder
- IC 74LS75 4bit bistable latch
- Resistors
- Capacitors
- 7 segment LED display
- Switches

References:

Morris Mano Design of Digital Systems

http://projectguidance.com

http://electronicsforu.com/electronics-projects/fastest-finger-first-indicator-2

http://www.learningelectronics.net/circuits/fastest-finger-first-indicator.html