A screenshot of a cell phone

Description automatically generated

*Figure 1 – The circuit with input* 0b01*.*

1. **Q: Briefly explain how the circuit works / what function does it perform in terms of its input and outputs?**

**A:** The Circuit takes the use of three Integrated Circuits being an inverter, a NAND Gate, and a D-Latch. Firstly, it undergoes a 2-4 Decoder by the use of both an Inverter and a NAND Gate that takes in eight signals, two per gate with one output each gate. This expands the signal to be from two-bits wide to four-bits wide. It also flips the signal. This four-bit binary signal is then sent to the D-Latch where it is saved even after the circuit is turned off. This in the end results in the circuit taking in four main values 00, 01, 10, 11, and then decoding it down to more special values such as 1110, 0111, etc.

1. **Q: What are the control signals on the 74HC75?**  
   **A:** The control signals of the 74HC75 are pins 1, 4, 8, 11, 14 being 1Q-bar, LE34, 4Q-bar, 2Q-bar, LE12, and 3Q-bar respectively.
2. See Figure 1.