9 Basic I/O

The Nexys A7 board includes two tri-color LEDs, sixteen slide switches, six push buttons, sixteen individual LEDs, and an eight-digit seven-segment display, as shown in Figure 9.1. The pushbuttons and slide switches are connected to the FPGA via series resistors to prevent damage from inadvertent short circuits (a short circuit could occur if an FPGA pin assigned to a pushbutton or slide switch was inadvertently defined as an output). The five pushbuttons arranged in a plus-sign configuration are "momentary" switches that normally generate a low output when they are at rest, and a high output only when they are pressed. The red pushbutton labeled "CPU RESET," on the other hand, generates a high output when at rest and a low output when pressed. The CPU RESET button is intended to be used in EDK designs to reset the processor, but you can also use it as a general-purpose pushbutton. Slide switches generate constant high or low inputs depending on their position.

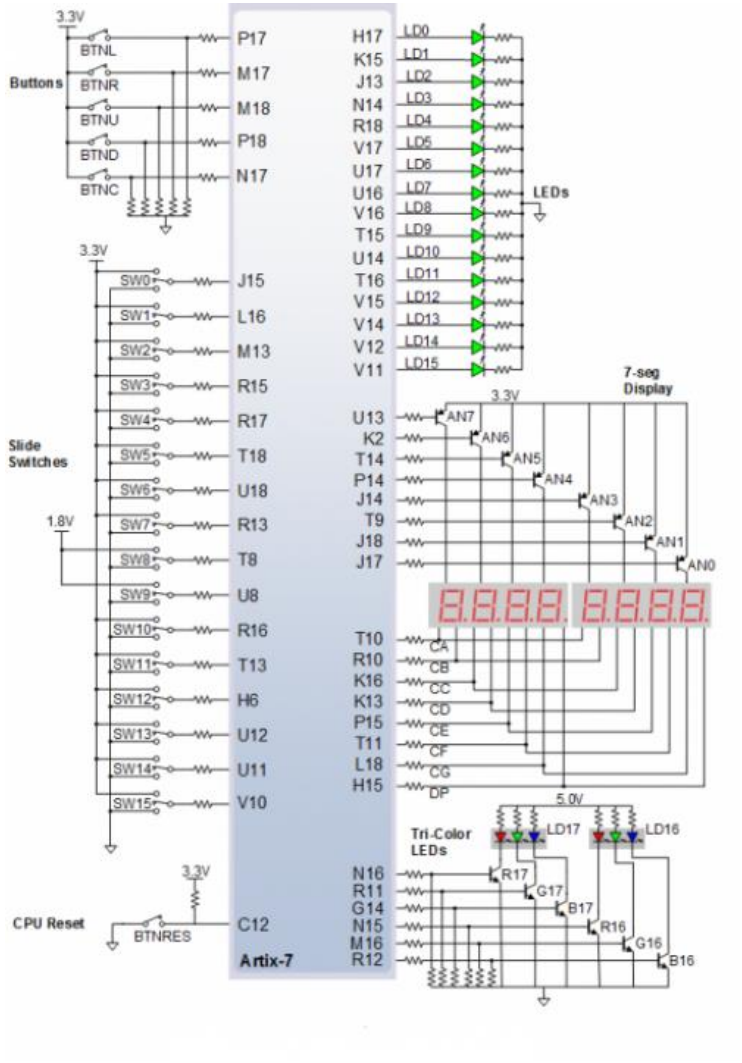

Figure 9.1 General Purpose I/O Devices on the Nexys A7

The sixteen-individual high-efficiency LEDs are anode-connected to the FPGA via 330-ohm resistors, so they will turn on when a logic high voltage is applied to their respective I/O pin. Additional LEDs that are not user-accessible indicate power-on, FPGA programming status, and USB and Ethernet port status.