LAB 1: Understanding the color-coding standard of UTP cable and construction and verification of straight through and Crossover cable.
Objectives(s):

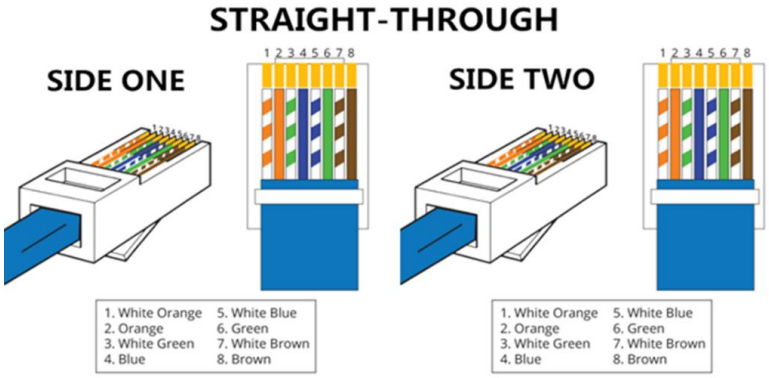
- To understand the color coding standard of UTP cable
- To create straight and crossover cable and test/verify its connectivity.

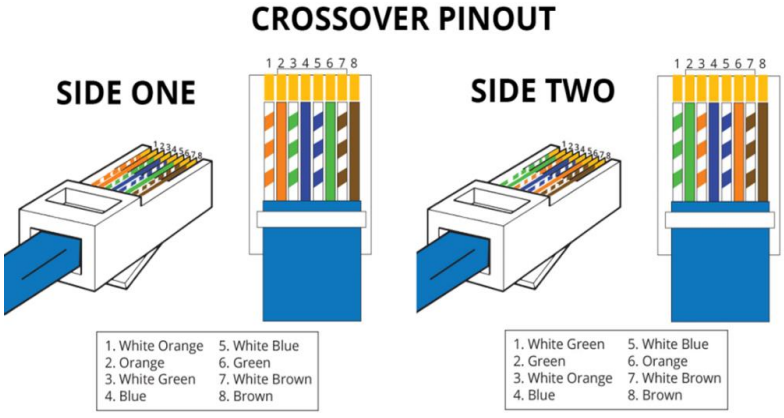
Apparatus: RJ-45 connector, Crimping Tool, Twisted pair Cable, Cable Tester

Background:

Unshielded Twisted Pair, a UTP cable is a cable used in computer networking that consists of two shielded wires twisted around each other. As the name would imply, these cables do not have insulation (shielding) between each of the paired wires. Consequently, they do not block electromagnetic interference, resulting in a higher risk of packet loss or corruption. Unshielded Twisted Pair cables are used in Ethernet cables and telephone lines.

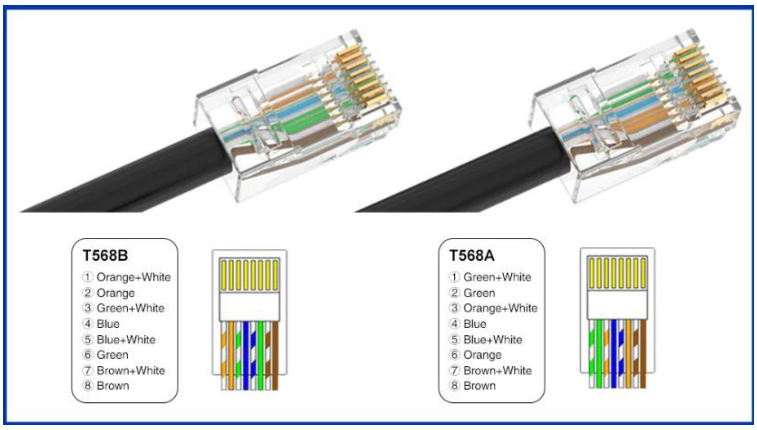
Working from left to right, the order of the wires shall be set with EIA 568 A or B standard as follows:



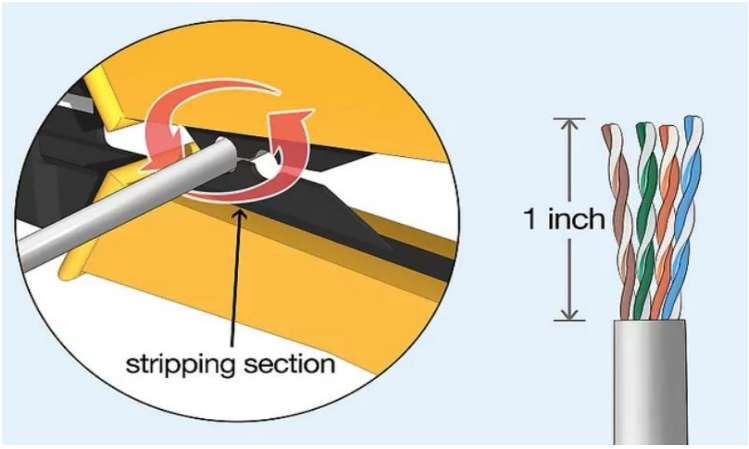


Procedure: To do these practical following steps should be done:

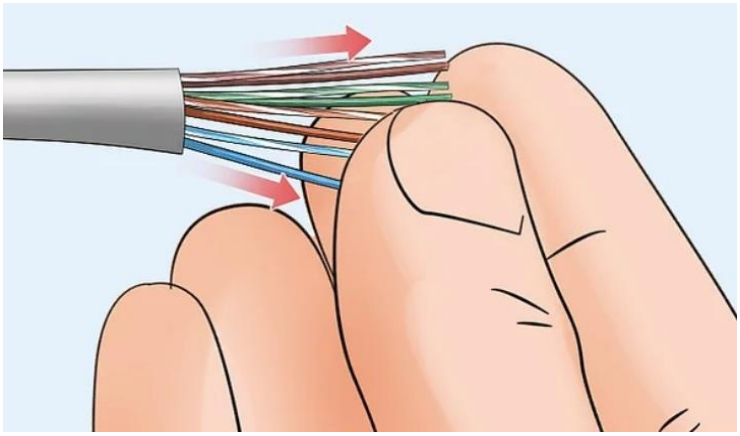
There are four pairs of wires in an Ethernet cable, and an Ethernet connector (8P8C) has eight pin slots. Each pin is identified by a number, starting from left to right, with the clip facing away from you.



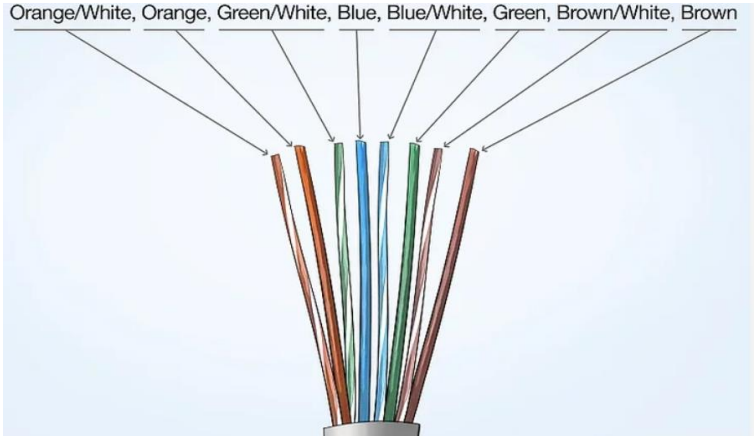
Step 1: Strip the cable jacket about 1 inch down from the end.



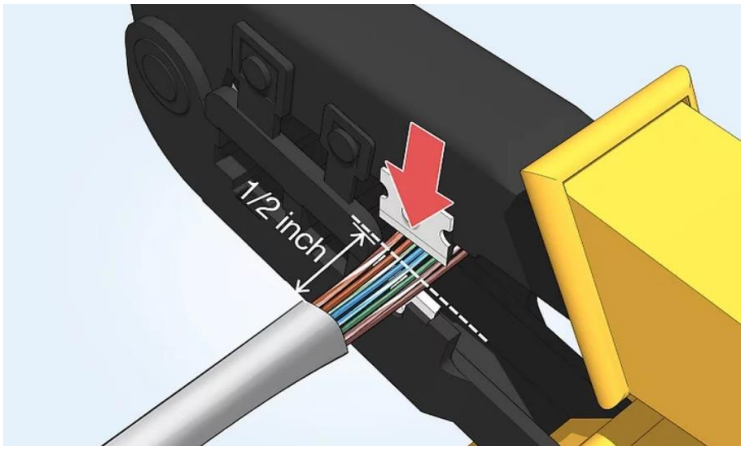
Step 2: Untwist and straighten the wires inside of the cable. Inside of the cable, a bunch of smaller wires twisted together. Separate the twisted wires and straighten them out so they are easier to sort into the right order.



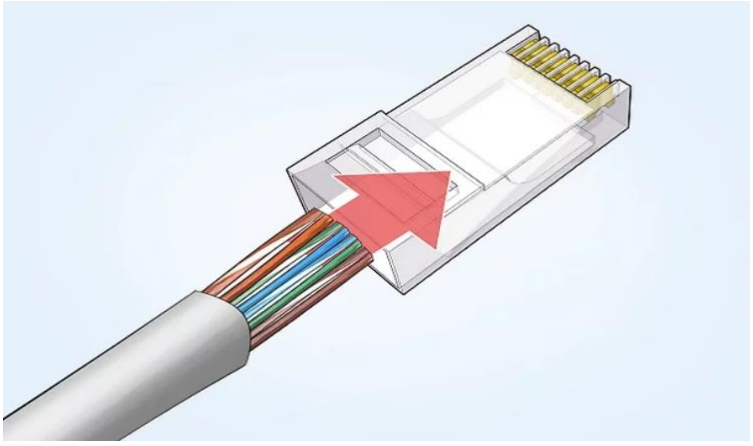
Step 3: Arrange the wires into the right order. Put the wires in the correct order so they can be properly crimped. The proper sequence is as follows from left to right: Orange/White, Orange, Green/White, Blue, Blue/White, Green, Brown/White and Brown.



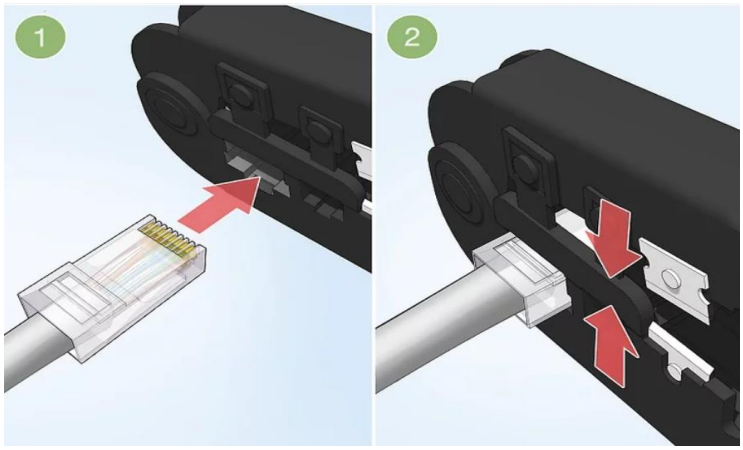
Step 4: Cut the wires into an even line 1⁄2 inch (13 mm) from sheathing. Hold the wires with thumb and index finger to keep them in order. Then, use the cutting section of the crimping tool to cut them into an even line.



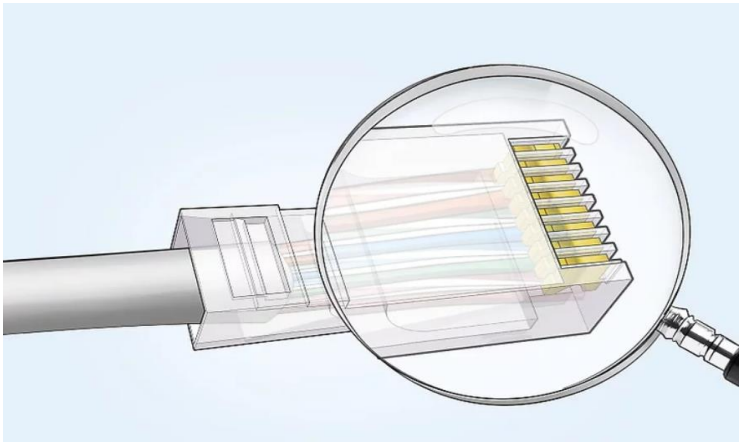
Step 5: Insert the wires into the RJ-45 connector. Hold the RJ-45 connector so the clip is on the underside and the small metal pins are facing up. Insert the cable into the connector so that each of the small wires fits into the small grooves in the connector.



Step 6: Stick the connector into the crimping part of the tool and squeeze twice. Insert the connector in the crimping section of the tool until it can’t fit any further. Squeeze the handles to crimp the connector and secure the wires.



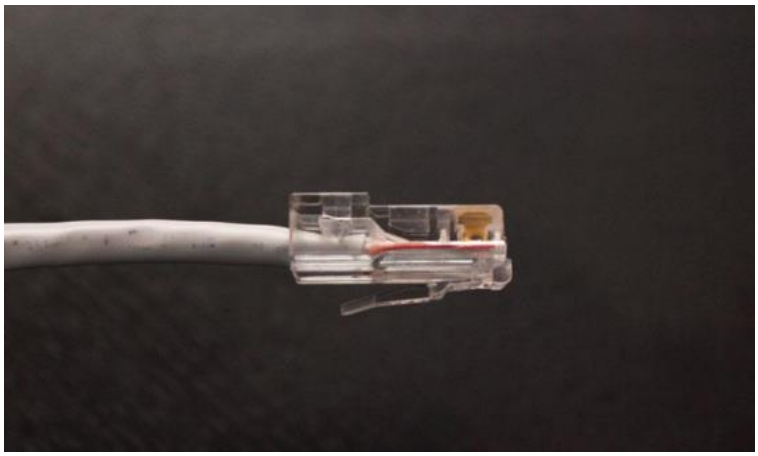
Step 7: Remove the cable from the tool and check that all of the pins are down.



Step 8: Repeat steps 1-7 for the other end of the cable.

Step 9: To make sure you have successfully terminated each end of the cable, use a cable tester to test each pin.

When you are all done, the connectors should look like this:



For crossover cables, simply make one end of the cable a T568A and the other end a T568B.

Conclusion:

An UTP cable is a common type of network cable used with wired network. UTP cables connect device such as PC's, router and switches within a LAN. Cross-over cable connect same device whereas straight through cable connect different device.