Practical 3

Aim: List different types od network cables. Create understanding of straight through and cross over cable using a twisted-pair cable and RJ-45 connector.

Theory/Practical:

Step 1:

Unroll the required length of network cable and add a little extra wire, just in case. If a boot is to be fitted, do so before stripping away the sleeve and ensure the boot faces the correct way.

Step 2:

Carefully remove the outer jacket of the cable. Be careful when stripping the jacket as to not nick or cut the internal wiring. One good way to do this is to cut lengthwise with snips or a knife along the side of the cable, away from yourself, about an inch toward the open end. This reduces the risk of nicking the wires' insulation. Locate the string inside with the wires, or if no string is found, use the wires themselves to unzip the sheath of the cable by holding the sheath in one hand and pulling sideways with the string or wire. Cut away the unzipped sheath and cut the twisted pairs about 1 1/4" (30 mm). You will notice 8 wires twisted in 4 pairs. Each pair will have one wire of a certain colour and another wire that is white with a coloured stripe matching its partner(this wire is called a tracer)

Step 3:

Inspect the newly revealed wires for any cuts or scrapes that expose the copper wire inside. If you have breached the protective sheath of any wire, you will need to cut the entire segment of wires off and start over at step one. Exposed copper wire will lead to cross-talk, poor performance or no connectivity at all. It is important that the jacket for all network cables remain intact.

Step 4:

Untwist the pairs so they will lay flat between your fingers. The white piece of thread can be cut off even with the jacket and disposed (see Warnings). For easier handling, cut the wires so that they are 3/4” (19 mm) long from the base of the jacket and even in length.

Step 5:

Arrange the wires based on the wiring specifications you are following. There are two methods one is 568A and second is 568B. Which one you use will depend on what is being connected. A straight-through cable is used to connect two different-layer devices (e.g. a hub and a PC). Two like devices normally require a cross-over cable. The difference between the two is that a straight-through cable has both ends wired identically with 568B, while a cross-over cable has one end wired 568A and the other end wired 568B. For our demonstration in the following steps, we will use 568B, but the instructions can easily be adapted to 568A.

Step 6:

Press all the wires flat and parallel between your thumb and forefinger. Verify the colours have remained in the correct order. Cut the top of the wires even with one another so that they are 1/2" (12.5 mm) long from the base of the jacket, as the jacket needs to go into the 8P8C connector by about 1/8", meaning that you only have a 1/2" of room for the individual cables. Leaving more than 1/2" untwisted can jeopardize connectivity and quality. Ensure that the cut leaves the wires even and clean; failure to do so may cause the wire not to make contact inside the jack and could lead to wrongly guided cores inside the plug.

Step 7:

Keep the wires flat and in order as you push them into the RJ-45 plug with the flat surface of the plug on top. The white/orange wire should be on the left if you're looking down at the jack. You can tell if all the wires made it into the jack and maintain their positions by looking head-on at the plug. You should be able to see a wire located in each hole, as seen at the bottom right. You may have to use a little effort to push the pairs firmly into the plug. The cabling jacket should also enter the rear of the jack about 1/4" (6 mm) to help secure the cable once the plug is crimped. You may need to stretch the sleeve to the proper length. Verify that the sequence is still correct before

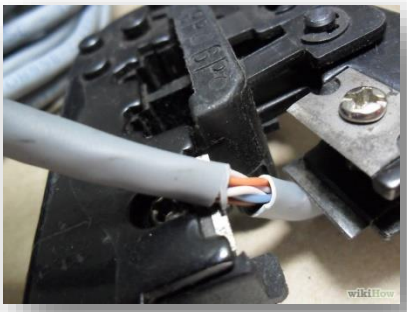
Step 8:

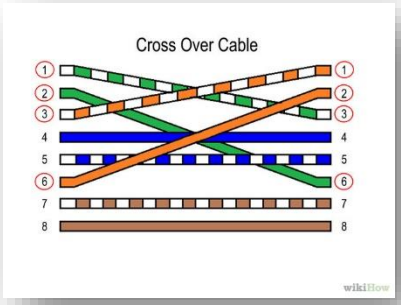
Place the wired plug into the crimping tool. Give the handle a firm squeeze. You should hear a ratcheting noise as you continue. Once you have completed the crimp, the handle will reset to the open position. To ensure all pins are set, some prefer to double-crimp by repeating the step.

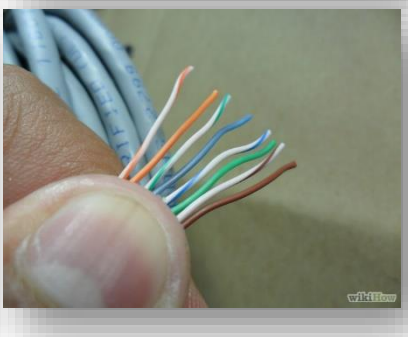
Step 9:

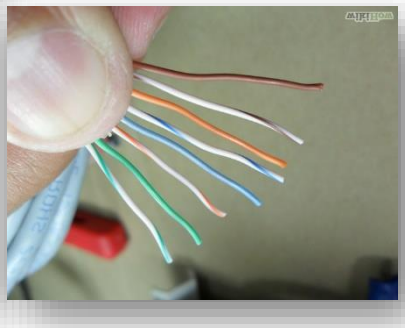
Repeat all of the above steps with the other end of the cable. The way you wire the other end (568A or 568B) will depend on whether you're making a straight-through, rollover, or cross-over cable.

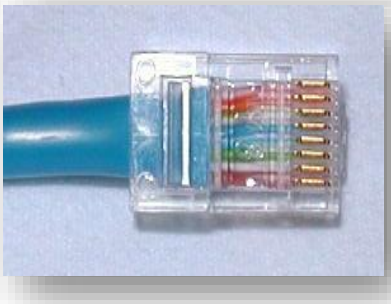
Output:











Question-Answers:

1) Explain RJ- 45 connector and crimping tool ?

- **RJ-45 connector -** RJ-45 connectors - They usually come in bags of 50, 100 etc. and cost less than a quarter each. Pay attention to the type of RJ-45 connector you get and make sure it is intended for the type of Cat5 wire you're using. There are two different kind of RJ-45 connectors, depending on whether you use them with solid or stranded wire cable as mentioned above. Using the wrong kind with the wrong cable will most likely result in a bad connection.

- **RJ-45 crimping tool - Crimping** tool - While this is the expensive part of making your own cables, it's only a one-time startup cost. They run anywhere from 10 to 50 bucks depending on the quality and features. Keep in mind that the crimpers will pay for themselves after you make a few cables. A good crimping tool has a pair of wire cutters built in, as well as a blade to strip insulation. It also might support crimping of other connectors such as RJ-11.

2) Give difference between straight through and cross over cable?

A straight-through cable is used to connect two different-layer devices (e.g. a hub and a PC). Two **like** devices normally require a cross-over cable. The difference between the two is that a straight-through cable has both ends wired identically with 568B, while a cross-over cable has one end wired 568A and the other end wired 568B

Straight through Cable (pc to hub)		**Cross over cable (pc to pc)**	
Sequence-1	***Sequence-2***	***Sequence-1***	***Sequence-2***
Orange White	Orange White	Orange White	Green White
Orange	Orange	Orange	Green
Green White	Green White	Green White	Orange White
Blue	Blue	Blue	Blue
Blue White	Blue White	Blue White	Blue White
Green	Green	Green	Orange
Brown White	Brown White	Brown White	Brown White
Brown	Brown	Brown	Brown

Conclusion:

In this practical, we came to know about making a 568B cable for connection.