**Assignment 2**

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**Q) Setting up small computer networks and Hands on networking commands:  
Set up a small wired and wireless network of 2 to 4 computers using Hub/Switch/Access point. It includes installation of LAN Cards, Preparation of Cables/ Installation and Configuration of Access Point, Assigning unique IP addresses and use of ping utility. Hands on for network commands - ping, pathping, ipconfig/ifconfig, arp, netstat, nbtstat, nslookup, route, traceroute/tracert, nmap.**

**Setting up small computer networks**

Setting Up Small Computer Network Using Hub/Switch

Wiring of twisted pair cables using RJ-45 connectors while maintaining cable integrity

**Equipments Needed:**

* Twisted pair cable (Cat5e/Cat6)
* RJ-45 connectors
* Crimping tool
* Wire stripper

Steps carried out:

**Preparing the Cable:**

* Striping of approximately 2 inches of the plastic jacket from the cable's end.
* Inspecting the wires for nicks or cuts and trimming off the affected portion.

**Arranging Wires:**

* Spreading the wires apart, holding the jacket's base securely.

**Crimping Process:**

* Inserted the wires into the RJ-45 connector slots based on the selected configuration and then used a crimping tool to firmly attach the connector to the cable.

**Installing LAN Cards:**

* Installing LAN cards in each computer to establish wired connectivity.

**Connecting Devices:**

* Using Ethernet cables to connect computers to available ports on the hub/switch.

**Verifying Connectivity:**

* Testing the connectivity using the "ping" command.

**Hands-On Networking Commands:**

* **ping:** Verify connectivity between devices using ICMP echo requests.
* **pathping:** Combine ping and tracert to diagnose network path issues and latency.
* **ipconfig (Windows) / ifconfig (Linux):** Retrieve IP configuration details and network interface information.
* **arp:** Manage Address Resolution Protocol (ARP) cache to map IP addresses to MAC addresses.
* **netstat:** Analyze active network connections, ports, and routing tables.
* **nbtstat:** Display NetBIOS over TCP/IP statistics for Windows systems.
* **nslookup:** Perform DNS queries to resolve domain names.
* **route:** Manipulate routing tables to define data paths.
* **traceroute (Linux) / tracert (Windows):** Trace the route taken by packets to reach a destination.
* **nmap:** Conduct network scanning for identifying open ports and services.