

Data Communication Laboratory Assignments:

A. Packet Tracer:

1. Install Packet tracer and understand the layout of the application and explore the working of different tools and devices in packet tracer. Create a network of minimum 5 devices connected through a hub and switch separately. Show the difference between hub and switch.
2. Create the Star, Ring, extended Star topology and Mesh topology in packet tracer. Explain different wires used for the communication.
3. Create a scenario in which two different groups (X and Y) of the same network are directly connected through different connecting devices. Each group has 8 systems. All 8 systems are connected through at least 1 switch and 1 hub.
 - a) Show the communication between the groups.
 - b) Provide the IP address Using (Class C Private Address).
4. Create a scenario in which 3 different branches (CSE, ECE and EEE) are in different VLAN connected through at least 3 switches. Each branch contains 6 end users. All 6 systems are connected through the switch or hub.
 - a) Provide the IP Address.
 - b) Configure all the switches and set passwords.
 - c) Show the intra-VLAN communication.
 - d) Show inter-VLAN communication.
5. Create a scenario in which four different groups (CSE, EEE, ECE and ME) of different local area networks are directly connected through immediate devices. Each group has 5 end systems. Given the scenario exists in the same network do the following.
 - a) Provide static IP addresses to every end device in the network.
 - b) Label each device in the network.
 - c) Label each interface with their IP addresses.
 - d) Show intra-LAN and inter-LAN communication.
 - e) Analyze the layer wise communication between the devices.
6. Create 3 different VLAN in ME (VLAN 2, 3 and 4), two different VLANs in CSE (VLAN 2 and 4), three different VLANs in EEE (VLAN 3,4 and 5) and two different VLANs in CE(VLAN 2 and 5).
 - a) Show the communication between ME and CSE.
 - b) Show communication between EEE and CE.
 - c) Show the Inter-VLAN communication between ME and EEE.
7. Create a scenario for NIT Sikkim where 4 different lab-classes (L1 to L4) are in different networks and connected through 4 Routers. Each class contains 10 systems. All 10 systems are connected through the switch or hub. Lab-class L1 and L2 use Class A addresses, Lab-class L3 and L4 use Class B addresses.
 - a) Provide the IP Address.
 - b) Apply static and dynamic routing.
 - c) Show the running configuration.
 - d) Show the routing Information.

B. Pipe Programs:

8. Enter two numbers from one end of the pipe and get the sum from the other end.
9. Input two numbers, through the child process and find their product and quotient in the parent process. If there is any error during the processing, display the error.
10. Collect the Ethernet address in hexadecimal and generate the 48 bit pattern of the same.
11. Input 8 numbers and display/output the result by 2X2 matrix manipulation.

12. Enter/Input 10 numbers and display the numbers in ascending order.
13. Enter any hexadecimal number and display the equivalent decimal and binary numbers.
14. Input any word up to 10 alphabets and display the number of different alphabets appearing in the word e.g. McGraw-Hill (Input), a = 1, c = 1, g = 1, h = 1, i = 1, l = 2, m = 1, r = 1, w = 1 (Output)
15. Input numbers 1 – 9 in any order and display the corresponding cardinality e.g. 2 (Input), Second (output)
16. Input temperature in °C and display the temperature in °F.
17. Enter a word and display the word in reverse order.
18. Enter a number, convert it into binary (8 bits), XOR it with 10101011 and display the number in decimal.
19. Input a set of 10 numbers and display mean and standard deviation for this set of input.

C. Socket Programs:

1. Implementation of basic Client Server program using TCP Socket.
 2. Implementation of basic Client Server program using UDP Socket.
 3. Implementation of TCP Client Server program with concurrent connection from clients.
 4. Implementing fully concurrent application with a TCP server acting as a directory server and client programs allowing concurrent connection and message transfer (E.g. Chat system).
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