CN Project List

No:	Project Title	Tools	Objective	What to Do
1	Implementation of a Peer-to-Peer (P2P) File Sharing System	Python/Java, Sockets, Flask	Develop a distributed file-sharing system to enable decentralized data exchange.	Develop a decentralized file-sharing system where users can share files directly without relying on a central server. Implement a peer discovery mechanism using sockets and enable file transfer using Flask for better user management.
2	Secure Chat Application with End-to-End Encryption	Python (Sockets, PyCrypto), Java	Ensure private and secure messaging between users.	Create a chat application using socket programming with end-to-end encryption. Use PyCrypto or other encryption libraries to encrypt messages before transmission and decrypt them upon reception, ensuring secure communication.
3	Real-Time Instant Messaging & VoIP Application	Python, WebRTC, Asterisk	Develop an integrated chat and voice communication application.	Build an instant messaging application that supports both text and voice communication. Use WebRTC for real-time audio/video communication and implement server-client architecture with network sockets.
4	Disaster Recovery Network Design	GNS3, AWS, Cisco	Develop a backup network for business continuity.	Develop a disaster recovery network that ensures business continuity during network failures. Use GNS3 to simulate network redundancy, implement failover mechanisms, and integrate cloud backups using AWS.
5	User Authentication through Socket Programming	Python, Java, Sockets, Flask	Secure user authentication over a network.	Implement a network-based authentication system where users must verify their identity before accessing a server. Use socket programming to manage user credentials securely and Flask for a web-based authentication interface.
6	Network Load Balancer	Nginx, HAProxy, Python	Implement load balancing techniques for network traffic.	Develop a network load balancer that distributes incoming traffic across multiple servers using different algorithms such as Round Robin, Least Connections, and IP Hashing. Implement this using Nginx and HAProxy.
7	VPN Implementation using OpenVPN	OpenVPN, WireGuard, Linux	Establish a secure virtual private network.	Set up a secure Virtual Private Network (VPN) using OpenVPN. Configure authentication mechanisms, encryption settings, and test data transmission over a public network using Linux-based networking tools.
8	Implementation of a DNS Server	BIND9, Linux, Python	Develop a local DNS resolver with security features.	Create a custom DNS resolver that improves performance with caching and security features. Use BIND9 to set up a local DNS server, add security rules to prevent cache poisoning attacks, and analyze query resolution time.
9	BGP Peering & ISP Network Configuration	GNS3	Configure Border Gateway Protocol (BGP) for ISPs.	Configure BGP routing for an ISP-level network, using GNS3. Set up peer relationships between multiple ISPs and optimize network performance using policy-based routing techniques.
10	Virtual Office Network Design using VPN	OpenVPN, WireGuard	Secure office network for remote employees.	Create a secure virtual office network for remote employees using VPN technologies like OpenVPN and WireGuard. Configure access control, encryption protocols, and test connectivity between remote devices.

11	Chat portal with FTP enabled	Python (Flask, Django), Java (Spring Boot), FTP servers	Develop a chat system with integrated FTP file transfer	Users can communicate via chat and share files using an FTP-enabled system.
12	Congestion Control & Flow Control	NS-3, MATLAB, Python (Scapy)	Implement congestion and flow control mechanisms in networks	Simulates congestion and flow control strategies like TCP Reno and TCP Tahoe.
13	Implementation of MPLS	Cisco Packet Tracer, GNS3, Mininet	Simulate MPLS for efficient packet forwarding	Implements label-based switching for faster and optimized network routing.
14	Instant Messenger (Android App)	Android (Kotlin/Java), Firebase, WebSockets	Build a real-time messaging Android app	Supports text, multimedia, and notifications for seamless communication.
15	Implementation of SMTP Server	Postfix, Sendmail, Python (smtplib)	Develop an SMTP mail server for email handling	Allows users to send and receive emails over a secure SMTP protocol.
16	Routing using reinforcement learning	Python (TensorFlow, OpenAI Gym), NS-3	Implement AI-based routing decisions.	Uses RL algorithms like Q-learning to optimize network packet routing.
17	SDN Load Balancing	Mininet, Ryu, OpenFlow, Pox Controller	Optimize network traffic distribution in SDN	Uses software-defined networking to balance traffic dynamically.
18	Virtual Routing Using Java Socket	Java (Socket Programming)	Implement a virtual router for network packet forwarding	Develops a software-based router handling routing functionalities.
19	Build a Reliable Version of UDP	Python (Socket), C++, Java	Implement TCP-like features in UDP	Adds reliability, congestion, and flow control in UDP communication.
20	Chat-enabled Online Shopping System	MERN Stack, Firebase, WebSockets	Develop an e-commerce system with live chat	Enables real-time communication between buyers and sellers.
21	IP Calculator for Subnet Design	Python (Flask, Django), Java	Create a subnet calculator for network design	Helps organizations design optimal subnet allocations.
22	Web Crawler Project	Python (Scrapy, BeautifulSoup, Selenium, Requests) Java (JSoup, Apache Nutch)	Develop a web crawler to automatically extract, index, and analyze data from websites	A web crawler will fetch web pages, extract relevant content (such as text, images, or links), and store it in a structured format. It can be used for applications like search engines, market analysis, or monitoring website changes.
23	DNS Resolver and Query Analyzer	Python (dnspython), Wireshark	Build a tool that queries DNS servers and analyzes responses.	Resolves domain names into IPs while analyzing DNS query response times and server hops.

24	Dynamic Routing Protocol Simulator	NS3, GNS3, Mininet, Python (Scapy, NetworkX), C++, Java (Socket Programming)	Develop a simulator that models and evaluates the performance of dynamic routing protocols (e.g., RIP, OSPF, EIGRP, BGP) in a network environment.	This project involves implementing a network simulation environment where routers dynamically exchange routing information based on predefined protocols. The simulator will measure metrics like convergence time, packet loss, and bandwidth efficiency to compare different routing strategies.
25	Network Virtualization and Slicing using SDN	Mininet, Ryu, ONOS, OpenDaylight, OpenFlow, Open vSwitch (OVS), Python, Kubernetes	Implement network virtualization and slicing in an SDN-based environment to optimize resource allocation	This project focuses on creating multiple virtual network slices over a shared physical infrastructure using SDN controllers. Each slice operates independently with its own bandwidth, security policies, and QoS settings. The SDN controller dynamically allocates network resources based on traffic demand, ensuring efficient usage of underlying hardware.
26	Simple HTTP Web Server	Python (Flask, HTTPServer), Java (Spring Boot), Node.js	Build a basic web server that serves HTML pages and handles HTTP requests.	A lightweight web server that handles HTTP GET/POST requests and serves static HTML pages.