Step 1: Create GitHub Accounts for Students

1. **Google Form for GitHub Usernames and Email Addresses:**
    - Create a Google Form to collect the GitHub usernames and email addresses of all students.
    - Include fields for Name, Register Number, GitHub Username, and Email Address.
2. **Provide Instructions:**
    - Send instructions to students on how to create a GitHub account if they don't have one.
    - Guide them to complete the Google Form with their new GitHub account details.

Step 2: Create a Repository for CN LAB

1. **Main Repository for CN LAB:**
    - Create a new GitHub repository named `CN-LAB`.
    - Add a README.md file describing the purpose of the repository and the syllabus.
2. **Upload Experiments:**
    - Upload the CN experiments and relevant files into their respective lab folders.

Step 3: Set Up Repositories for Each Student

1. **Create Student Repositories:**
    - Create individual repositories for each student using their GitHub username.
    - Example: `student-Registernumber`. Eg. RA2311003050346
    -
2. **Invite Students:**
    - Add each student as a collaborator to their respective repository.
    - Ensure they have access to push and pull changes

Pre-lab Requirement: Cisco Packet Tracer Course

Before starting the CN LAB experiments, students are required to complete the **Getting Started with Cisco Packet Tracer** online course. This course covers:

1. **Module 1: Download and Use Cisco Packet Tracer**
    - How to download and install Cisco Packet Tracer.
    - Basic navigation and features of the tool.
2. **Module 2: Create a Cisco Packet Tracer Network**
    - Steps to create and configure a basic network.
    - Practice scenarios to enhance networking skills.
3. **Final Exam**

- An assessment to test the understanding of the course content.

CN LAB Syllabus Overview

- **Lab 1: Introduction to Packet Tracer, Peer to Peer communication, study of cables and its color codes**
- **Lab 2: Implementation of Network Topologies**
- **Lab 3: Router Configuration (Creating Passwords, Configuring Interfaces)**
- **Lab 4: IP addressing and Subnetting (VLSM)**
- **Lab 5: Static and Default Routing**
- **Lab 6: NAT Configuration**
- **Lab 7: Implementation of RIP version 1**
- **Lab 8: Implementation of RIP version 2**
- **Lab 9: Implementation of Single Area OSPF**
- **Lab 10: Implementation of Multi-Area OSPF**
- **Lab 11: PPP Configuration**
- **Lab 12: HDLC Configuration**
- **Lab 13: Implementation of BGP**
- **Lab 14: Implementation of EIGRP**
- **Lab 15: Telnet Configuration**

CN LAB Observation Format

Lab 1: Introduction to Packet Tracer, Peer-to-Peer Communication, Study of Cables and its Color Codes

- **Objective:**
  - **To introduce Packet Tracer and its basic features.**
  - **To understand peer-to-peer communication.**
  - **To study different types of network cables and their color codes.**
- **Materials Required:**
  - **Packet Tracer software**
  - **Network cables (Ethernet, crossover, etc.)**
- **Theory:**
  - **Overview of Packet Tracer.**
  - **Basics of peer-to-peer communication.**
  - **Color coding standards for network cables.**
- **Procedure:**
  - **Open Packet Tracer and explore its interface.**
  - **Create a simple network with two computers connected via a switch.**
  - **Configure IP addresses for peer-to-peer communication.**
  - **Test the connection using the ping command.**
  - **Study the different types of network cables and note their color codes.**
- **Observations:**
  - **Document the IP configuration steps and ping results.**
  - **Note the color codes for different types of cables.**
- **Conclusion:**
  - **Summarize the steps and results.**
  - **Reflect on the importance of understanding basic networking concepts.**

Lab 2: Implementation of Network Topologies

- **Objective:**
  - **To implement and understand different network topologies.**
- **Materials Required:**
  - **Packet Tracer software**
- **Theory:**
  - **Overview of various network topologies (bus, star, ring, mesh, hybrid).**
- **Procedure:**
  - **Open Packet Tracer.**
  - **Implement a bus topology with at least three devices.**
  - **Implement a star topology with at least three devices.**
  - **Implement a ring topology with at least three devices.**
  - **Implement a mesh topology with at least three devices.**

    - **Test the connections in each topology using the ping command.**
- **Observations:**
    - **Document the setup and ping results for each topology.**
- **Conclusion:**
    - **Summarize the characteristics and differences of each topology.**

Lab 3: Router Configuration (Creating Passwords, Configuring Interfaces)

- **Objective:**
    - **To configure a router by setting up passwords and interfaces.**
- **Materials Required:**
    - **Packet Tracer software**
- **Theory:**
    - **Basics of router configuration.**
    - **Importance of securing router access.**
- **Procedure:**
    - **Open Packet Tracer and create a network with a router and two computers.**
    - **Access the router's CLI and set up passwords (console, enable, and VTY).**
    - **Configure the router interfaces with IP addresses.**
    - **Test connectivity between the computers through the router.**
- **Observations:**
    - **Document the configuration steps and test results.**
- **Conclusion:**
    - **Reflect on the importance of securing and configuring routers properly.**

Lab 4: IP Addressing and Subnetting (VLSM)

- **Objective:**
    - **To understand and implement IP addressing and Variable Length Subnet Masking (VLSM).**
- **Materials Required:**
    - **Packet Tracer software**
- **Theory:**
    - **Basics of IP addressing and subnetting.**
    - **Overview of VLSM.**
- **Procedure:**
    - **Design a network with multiple subnets.**
    - **Calculate the subnets using VLSM.**
    - **Assign IP addresses to devices in each subnet.**
    - **Test the connectivity between devices in different subnets.**
- **Observations:**

    - **Document the subnet calculations and test results.**
- **Conclusion:**
    - **Summarize the process and importance of proper IP addressing and subnetting.**

Lab 5: Static and Default Routing

- **Objective:**
    - **To configure and understand static and default routing.**
- **Materials Required:**
    - **Packet Tracer software**
- **Theory:**
    - **Basics of routing.**
    - **Differences between static and default routing.**
- **Procedure:**
    - **Create a network with at least two routers.**
    - **Configure static routes on each router.**
    - **Configure a default route on one router.**
    - **Test the connectivity between devices across the routers.**
- **Observations:**
    - **Document the routing configurations and test results.**
- **Conclusion:**
    - **Reflect on the differences and use cases of static and default routing.**

Lab 6: NAT Configuration

- **Objective:**
    - **To configure Network Address Translation (NAT).**
- **Materials Required:**
    - **Packet Tracer software**
- **Theory:**
    - **Overview of NAT and its importance.**
- **Procedure:**
    - **Create a network with an internal and an external segment.**
    - **Configure NAT on the router connecting both segments.**
    - **Test the connectivity from internal to external networks.**
- **Observations:**
    - **Document the NAT configuration steps and test results.**
- **Conclusion:**
    - **Summarize the benefits and working of NAT.**

Lab 7: Implementation of RIP Version 1

- **Objective:**
  - **To configure and understand Routing Information Protocol (RIP) version 1.**
- **Materials Required:**
  - **Packet Tracer software**
- **Theory:**
  - **Basics of RIP and its working.**
- **Procedure:**
  - **Create a network with at least three routers.**
  - **Configure RIP version 1 on each router.**
  - **Test the connectivity between all network segments.**
- **Observations:**
  - **Document the RIP configuration steps and test results.**
- **Conclusion:**
  - **Reflect on the functionality and limitations of RIP version 1.**

Lab 8: Implementation of RIP Version 2

- **Objective:**
  - **To configure and understand Routing Information Protocol (RIP) version 2.**
- **Materials Required:**
  - **Packet Tracer software**
- **Theory:**
  - **Differences between RIP version 1 and version 2.**
- **Procedure:**
  - **Create a network with at least three routers.**
  - **Configure RIP version 2 on each router.**
  - **Test the connectivity between all network segments.**
- **Observations:**
  - **Document the RIP version 2 configuration steps and test results.**
- **Conclusion:**
  - **Summarize the improvements of RIP version 2 over version 1.**

Lab 9: Implementation of Single Area OSPF

- **Objective:**
  - **To configure and understand Open Shortest Path First (OSPF) in a single area.**
- **Materials Required:**

    - **Packet Tracer software**
- **Theory:**
    - **Overview of OSPF and its benefits.**
- **Procedure:**
    - **Create a network with at least three routers.**
    - **Configure OSPF in a single area on each router.**
    - **Test the connectivity between all network segments.**
- **Observations:**
    - **Document the OSPF configuration steps and test results.**
- **Conclusion:**
    - **Reflect on the advantages of using OSPF.**

Lab 10: Implementation of Multi-Area OSPF

- **Objective:**
    - **To configure and understand OSPF in a multi-area environment.**
- **Materials Required:**
    - **Packet Tracer software**
- **Theory:**
    - **Basics of multi-area OSPF.**
- **Procedure:**
    - **Create a network with at least three routers and two OSPF areas.**
    - **Configure multi-area OSPF on each router.**
    - **Test the connectivity between all network segments.**
- **Observations:**
    - **Document the multi-area OSPF configuration steps and test results.**
- **Conclusion:**
    - **Summarize the benefits of using multi-area OSPF.**

Lab 11: PPP Configuration

- **Objective:**
    - **To configure Point-to-Point Protocol (PPP) on serial links.**
- **Materials Required:**
    - **Packet Tracer software**
- **Theory:**
    - **Overview of PPP and its features.**
- **Procedure:**
    - **Create a network with at least two routers connected via a serial link.**
    - **Configure PPP on the serial link.**
    - **Test the connectivity between the routers.**

- **Observations:**
    - **Document the PPP configuration steps and test results.**
- **Conclusion:**
    - **Reflect on the advantages of using PPP.**

Lab 12: HDLC Configuration

- **Objective:**
    - **To configure High-Level Data Link Control (HDLC) on serial links.**
- **Materials Required:**
    - **Packet Tracer software**
- **Theory:**
    - **Basics of HDLC and its usage.**
- **Procedure:**
    - **Create a network with at least two routers connected via a serial link.**
    - **Configure HDLC on the serial link.**
    - **Test the connectivity between the routers.**
- **Observations:**
    - **Document the HDLC configuration steps and test results.**
- **Conclusion:**
    - **Summarize the benefits and limitations of HDLC.**

Lab 13: Implementation of BGP

- **Objective:**
    - **To configure and understand Border Gateway Protocol (BGP).**
- **Materials Required:**
    - **Packet Tracer software**
- **Theory:**
    - **Overview of BGP and its role in the internet.**
- **Procedure:**
    - **Create a network with at least two autonomous systems (AS).**
    - **Configure BGP on the routers in each AS.**
    - **Establish BGP peering between the ASes.**
    - **Test the connectivity between networks in different ASes.**
- **Observations:**
    - **Document the BGP configuration steps and test results.**
- **Conclusion:**
    - **Reflect on the importance of BGP in large networks.**

Lab 14: Implementation of EIGRP

- **Objective:**
  - **To configure and understand Enhanced Interior Gateway Routing Protocol (EIGRP).**
- **Materials Required:**
  - **Packet Tracer software**
- **Theory:**
  - **Basics of EIGRP and its features.**
- **Procedure:**
  - **Create a network with at least three routers.**
  - **Configure EIGRP on each router.**
  - **Test the connectivity between all network segments.**
- **Observations:**
  - **Document the EIGRP configuration steps and test results.**
- **Conclusion:**
  - **Summarize the advantages of using EIGRP.**

Lab 15: Telnet Configuration

- **Objective:**
  - **To configure Telnet for remote router management.**
- **Materials Required:**
  - **Packet Tracer software**
- **Theory:**
  - **Basics of Telnet and its usage.**
- **Procedure:**
  - **Create a network with a router and a computer.**
  - **Configure Telnet on the router.**
  - **Test remote access to the router using Telnet from the computer.**
- **Observations:**
  - **Document the Telnet configuration steps and test results.**
- **Conclusion:**
  - **Reflect on the importance of remote management and the security considerations of using Telnet.**