📌 1. What the Project Is

The video you shared is about **designing and implementing a Campus Network in Cisco Packet Tracer** — a simulation of a real-life university/campus network. In this type of project:

Goals usually include:
✅ Creating a logical network that connects multiple departments/buildings.
✅ Using VLANs to separate traffic by department.
✅ Implementing **Inter-VLAN routing** so different VLANs can communicate.
✅ Setting up **DHCP** to assign IPs automatically.
✅ Configuring routing between multiple routers (sometimes with RIP).
✅ Securing devices (SSH/Port-Security).

This project simulates an enterprise (campus) network where each department has its **own logical subnet / VLAN** and all devices can eventually reach each other through routing.

🛠️ 2. Typical Devices You'll Use

In Cisco Packet Tracer you'll place:
📌 **Routers** (for routing between VLANs)
📌 **Layer-2 Switches** (for access switches)
📌 **Servers** (DHCP, Web, Print, etc.)
📌 **PCs/Laptops** (end users)
📌 **Cables** (Copper straight-through and cross-over when needed)

🧠 3. High-Level Topology

A common campus project looks like this:

```
PCs -> Access Switches -> Core/Distribution Switch -> Router -> Internet/Servers
Departments like: Admin, Engineering, Labs, Wi-Fi, etc., separated by VLANs.
```

🧩 4. Step-by-Step Setup with Commands

✅ A) Step 1 — Set IPs on PCs

Each PC gets a static IP when doing initial tests.

Example:
PC in Admin VLAN

```
IP: 192.168.10.10
Subnet: 255.255.255.0
Gateway: 192.168.10.1
```

PC in Engineering VLAN

```
IP: 192.168.20.10
Subnet: 255.255.255.0
Gateway: 192.168.20.1
```

💡 *You type these in the Packet Tracer desktop PC config (not CLI).*

✅ B) Step 2 — Create VLANs on the Switch

Enter the switch CLI:

```
Switch> enable
Switch# configure terminal

Switch(config)# vlan 10
Switch(config-vlan)# name Admin
Switch(config-vlan)# exit

Switch(config)# vlan 20
Switch(config-vlan)# name Engineering
Switch(config-vlan)# exit
```

(Repeat for other VLANs like Labs, Wi-Fi, etc.)

✅ C) Step 3 — Assign Switch Ports to VLANs

```
Switch(config)# interface range fa0/2-fa0/5
Switch(config-if-range)# switchport mode access
Switch(config-if-range)# switchport access vlan 10
```

Another VLAN:

```
Switch(config)# interface range fa0/6-fa0/9
Switch(config-if-range)# switchport mode access
```

```
Switch(config-if-range)# switchport access vlan 20
```

This tells the switch which ports belong to which VLANs.

✅ D) Step 4 — Enable Trunk Port to Carry VLANs

Usually the switch connects to the router or another switch via a trunk:

```
Switch(config)# interface fa0/1
Switch(config-if)# switchport mode trunk
Switch(config-if)# switchport trunk allowed vlan 10,20  (or all)
```

This trunk link can carry more than one VLAN.

✅ E) Step 5 — Configure Router for Inter-VLAN Routing

On the router, we use **sub-interfaces** for each VLAN (Router-on-a-Stick):

```
Router> enable
Router# configure terminal

Router(config)# interface fa0/0.10
Router(config-subif)# encapsulation dot1Q 10
Router(config-subif)# ip address 192.168.10.1 255.255.255.0

Router(config)# interface fa0/0.20
Router(config-subif)# encapsulation dot1Q 20
Router(config-subif)# ip address 192.168.20.1 255.255.255.0
```

This allows routing between VLANs.

> **Tip:** If using a Layer-3 switch instead, you'll create SVIs (`interface vlan 10` , `interface vlan 20`) instead of sub-interfaces.

✅ F) Step 6 — Configure DHCP on Router (Optional)

If you want PCs to get IPs automatically, you can configure DHCP on the router:

```
Router(config)# ip dhcp pool Admin
Router(dhcp-config)# network 192.168.10.0 255.255.255.0
Router(dhcp-config)# default-router 192.168.10.1

Router(config)# ip dhcp pool Eng
Router(dhcp-config)# network 192.168.20.0 255.255.255.0
Router(dhcp-config)# default-router 192.168.20.1
```

This gives PCs dynamic IPs.

🧪 5. Testing and Verification

Use these commands:

✅ Check VLANs

```
Switch# show vlan brief
```

✅ Check Trunk

```
Switch# show interfaces trunk
```

✅ Check Router Routing

```
Router# show ip route
```

✅ Ping Between VLANs

```
PC> ping 192.168.20.10
```

If this works, routing is correct.

🧠 6. What You Learn From This Project

✔ Understanding VLANs (Virtual LANs)
✔ Inter-VLAN routing (Router-on-a-Stick)
✔ DHCP configuration

✅ Trunking and access ports
✅ Testing and verification commands

If you want, I can **break this down further with screenshots or provide a full Packet Tracer .pkt file** for this exact campus network topology. Just let me know!