LAB 3:

1. Traditional switch vs openflow switch.
   Traditional switch operates on proprietary protocols to forward network traffic based on the destination MAC address. an OpenFlow switch is a software-defined network switch that uses the OpenFlow protocol to allow the central controller to determine the flow rules for forwarding network traffic. When the controller is off, then network comes back to traditional switching as a back up.

2.

```
    def build(self):
        s1 = self.addSwitch('s1')
        s2 = self.addSwitch('s2')
        s3 = self.addSwitch('s3')
        s4 = self.addSwitch('s4')

        h1 = self.addHost('h1', mac="00:00:00:00:11:11", ip="192.168.1.1/24")
        h2 = self.addHost('h2', mac="00:00:00:00:11:12", ip="192.168.1.2/24")
        h3 = self.addHost('h3', mac="00:00:00:00:11:13", ip="192.168.1.3/24")
        h4 = self.addHost('h4', mac="00:00:00:00:11:14", ip="192.168.1.4/24")

        self.addLink(h1, s1)
        self.addLink(h2, s2)
        self.addLink(h3, s3)
        self.addLink(h4, s4)

        self.addLink(s1, s2)
        self.addLink(s2, s3)
        self.addLink(s3, s4)
        self.addLink(s4, s1)
```

```
student@VM2:~/Downloads/SDN-Lab2-7/Lab2-3/mininet_scripts$ sudo python2 LAB-ring
-topo.py
[sudo] password for student:
Connecting to remote controller at 127.0.0.1:6653
*** Creating network
*** Adding controller
*** Adding hosts:
h1 h2 h3 h4
*** Adding switches:
s1 s2 s3 s4
*** Adding links:
(h1, s1) (h2, s2) (h3, s3) (h4, s4) (s1, s2) (s2, s3) (s3, s4) (s4, s1)
*** Configuring hosts
h1 h2 h3 h4
*** Starting controller
c1
*** Starting 4 switches
s1 s2 s3 s4 ...
*** Starting CLI:
mininet>
```

3.

2 lines added to code:

```
print("Link S3 to S4 - bringing up again - all nodes will be reachable")

net.configLinkStatus('s3', 's4', 'up')
net.pingAll()
```

```
Connecting to remote controller at 127.0.0.1:6653
*** Creating network
*** Adding controller
*** Adding hosts:
h1 h2 h3 h4
*** Adding switches:
s1 s2 s3 s4
*** Adding links:
(h1, s1) (h2, s2) (h3, s3) (h4, s4) (s1, s2) (s2, s3) (s3, s4)
*** Configuring hosts
h1 h2 h3 h4
*** Starting controller
c1
*** Starting 4 switches
s1 s2 s3 s4 ...
Topology is up, lets ping
*** Ping: testing ping reachability
h1 -> h2 h3 h4
h2 -> h1 h3 h4
h3 -> h1 h2 h4
h4 -> h1 h2 h3
*** Results: 0% dropped (12/12 received)
Link S3 to S4 - bringing down - h4 will not be reachable(ping)
*** Ping: testing ping reachability
h1 -> h2 h3 X
h2 -> h1 h3 X
h3 -> h1 h2 X
h4 -> X X X
*** Results: 50% dropped (6/12 received)
Link S3 to S4 - bringing up again - all nodes will be reachable
*** Ping: testing ping reachability
h1 -> h2 h3 h4
h2 -> h1 h3 h4
h3 -> h1 h2 h4
h4 -> h1 h2 h3
*** Results: 0% dropped (12/12 received)
*** Starting CLI:
mininet>
```