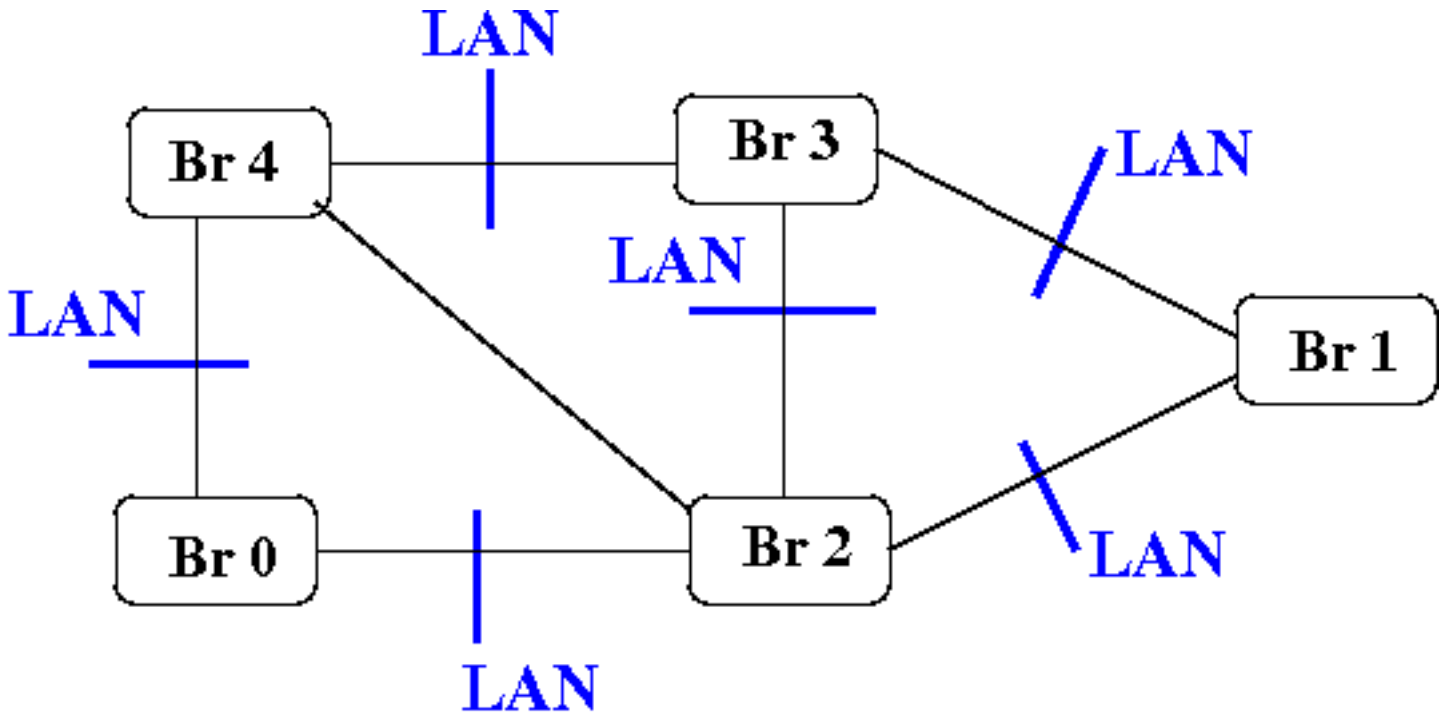
**CS 455 - Computer Networks**
**Homework 3**

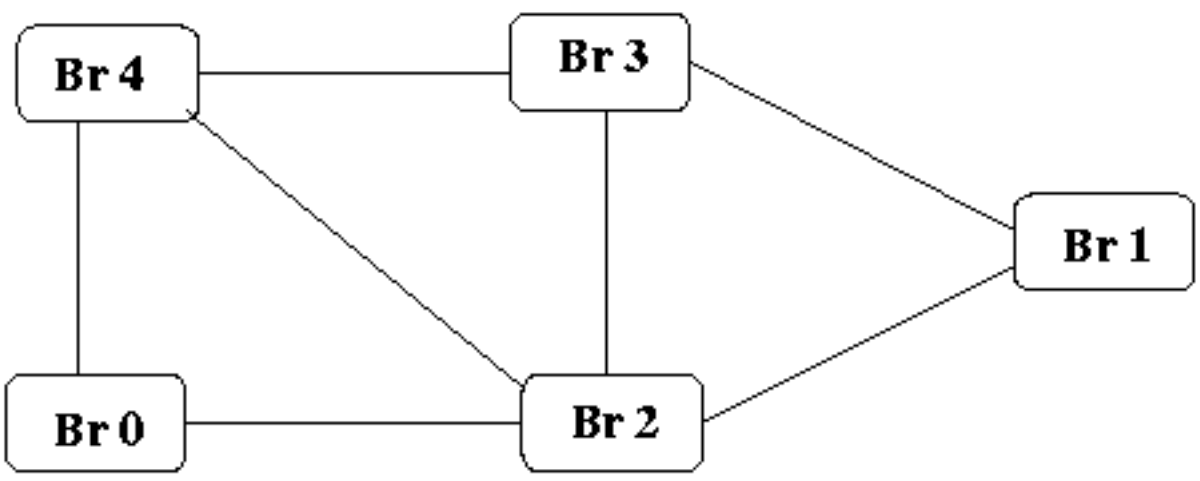
Due: See class webpage.

## Question 1 (40 pts)

Consider a number of inter-connected LAN connected in the following manner:

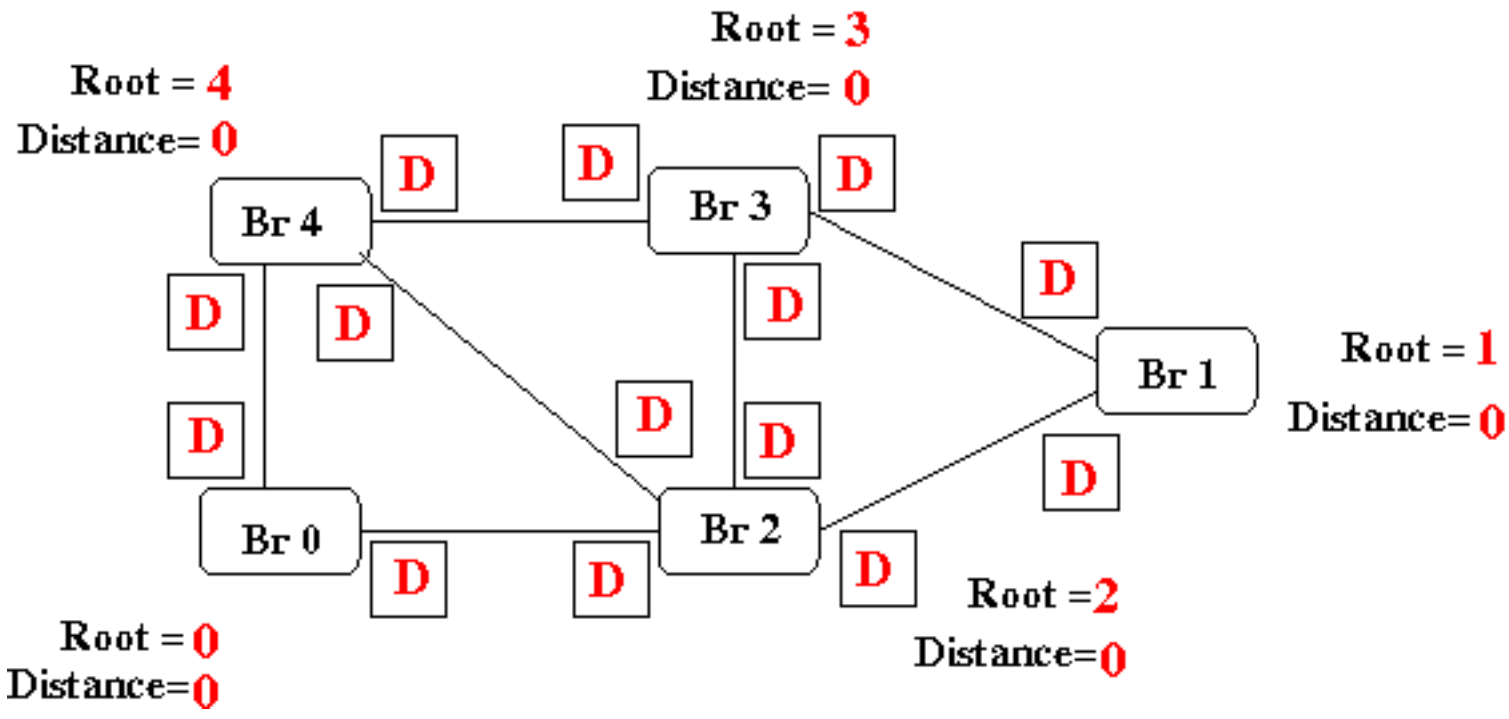



For **simplicity**, we remove the **LANs** from the figure:




**Questions:**

1. Give the values of the initial state of the bridges when they are initialized in the following figure: (10 pts)

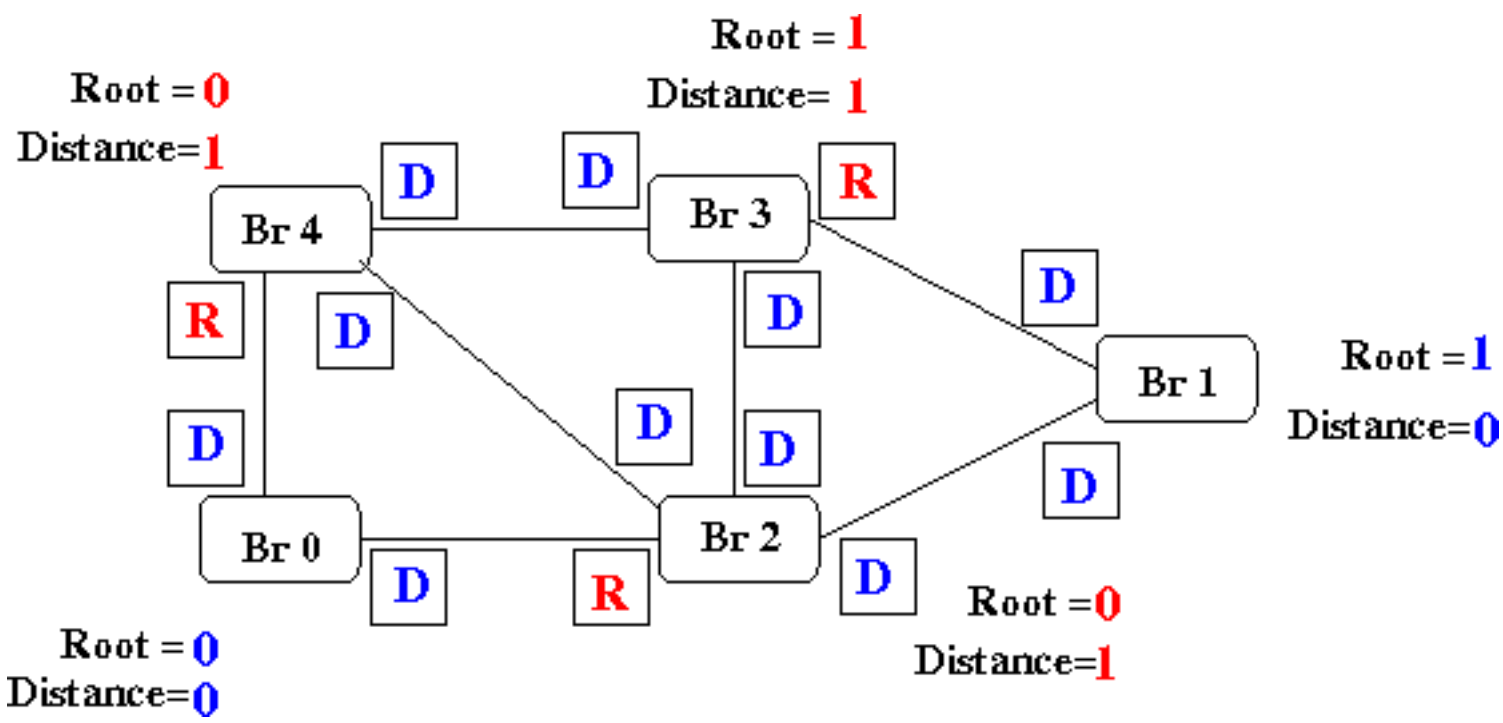


Write the state of the ports in their corresponding boxes.

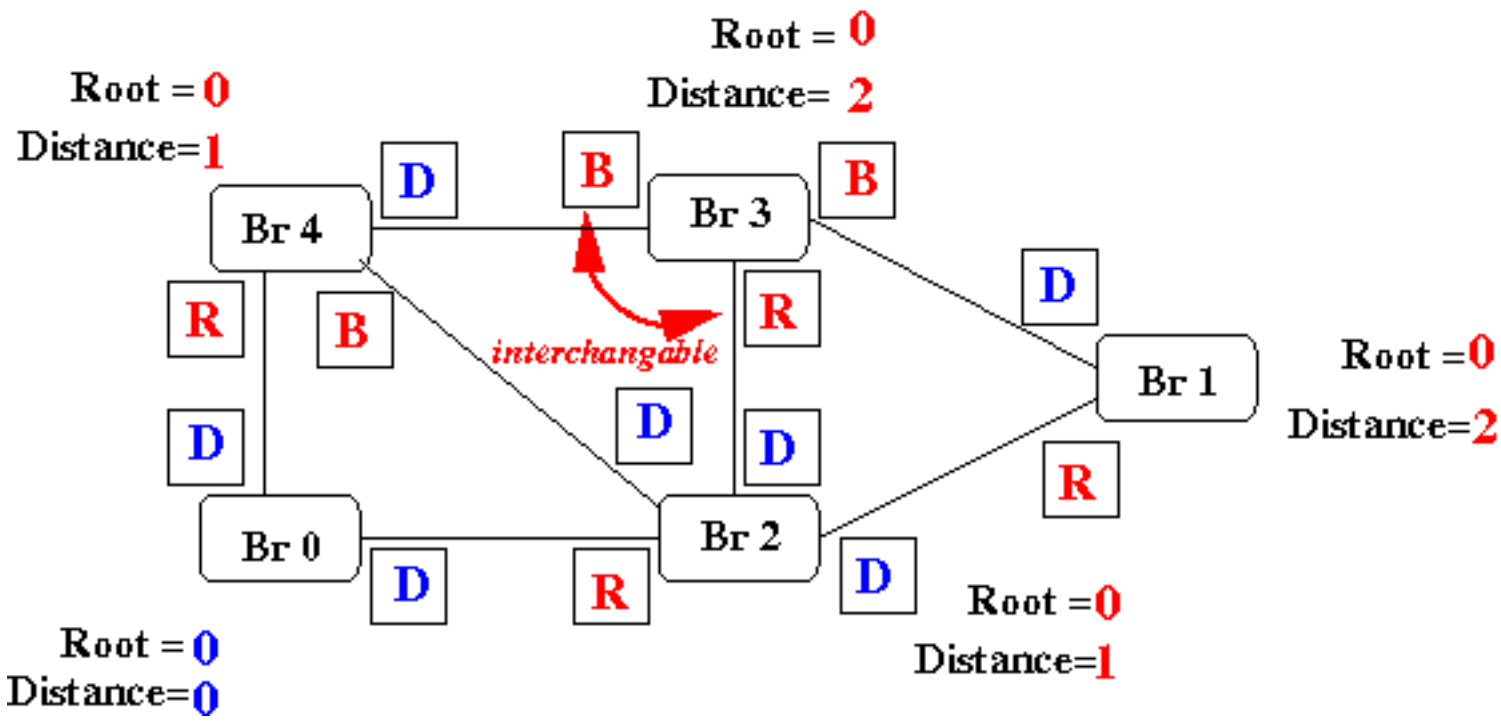
2. Give the configuration control messages sent by each bridge in the state given above (10 pts)

   - Bridge 0: (id=0, root=0, dist=0)
   - Bridge 1: (id=1, root=1, dist=0)
   - Bridge 2: (id=2, root=2, dist=0)
   - Bridge 3: (id=3, root=3, dist=0)
   - Bridge 4: (id=4, root=4, dist=0)

3. Show the values of the state variables of the bridges after the configuration control messages that were transmitted in **part 2 (above)** have been processed: (10 pts)




4. Show the values of the state variables of the bridges after the **Spanning Tree Algorithm** has **converged** to the **final state**: (10 pts)

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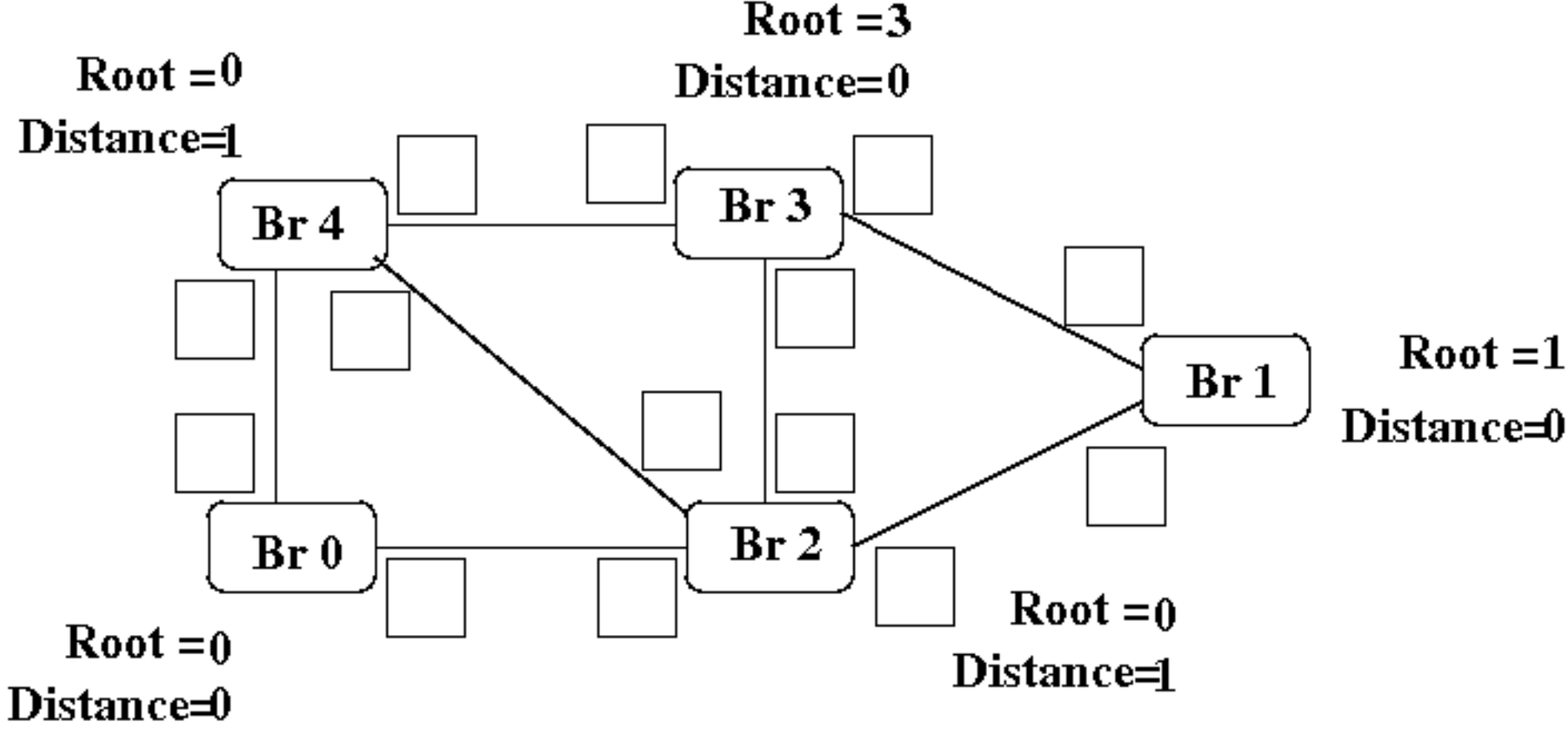
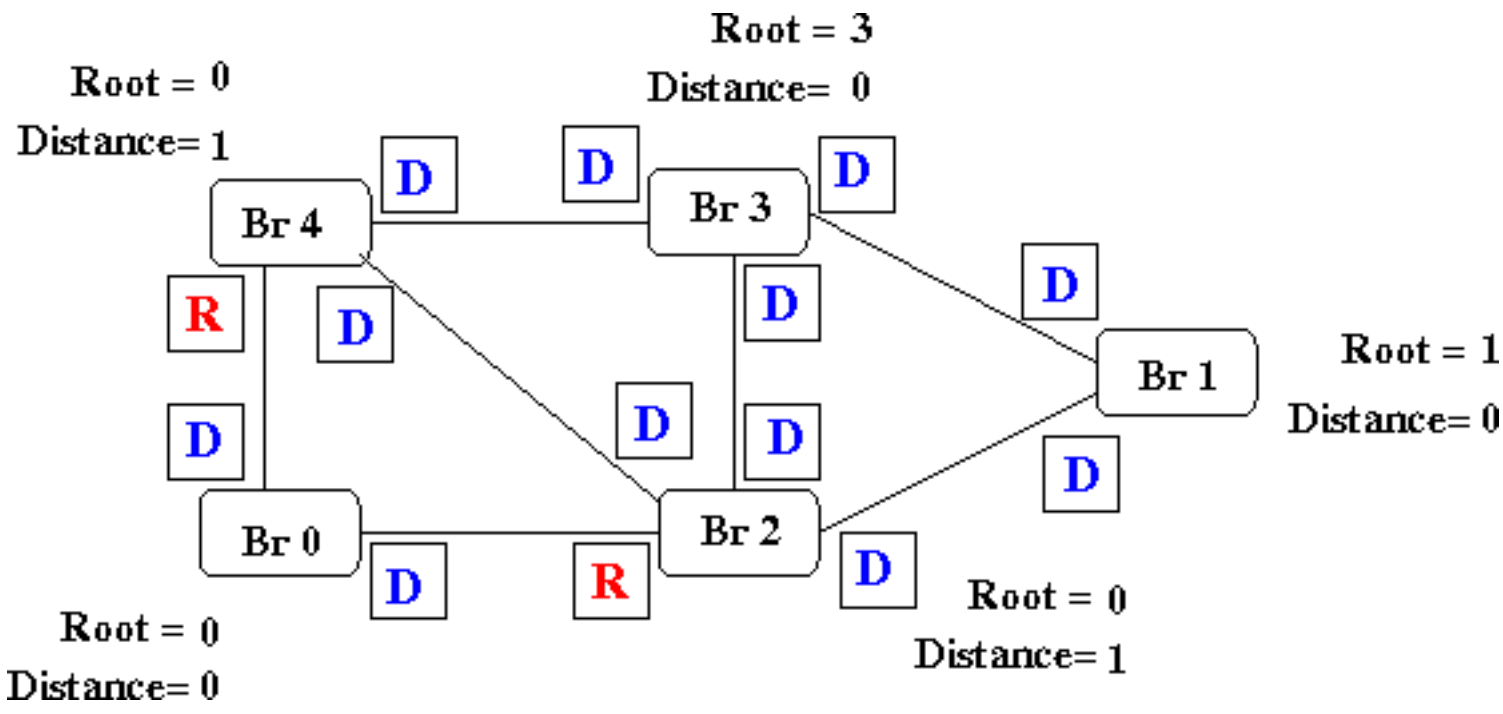
## Question 2 (30 pts)

1. Given that network is in the state given the following figure:




There are no ***blocked*** port in the above state.

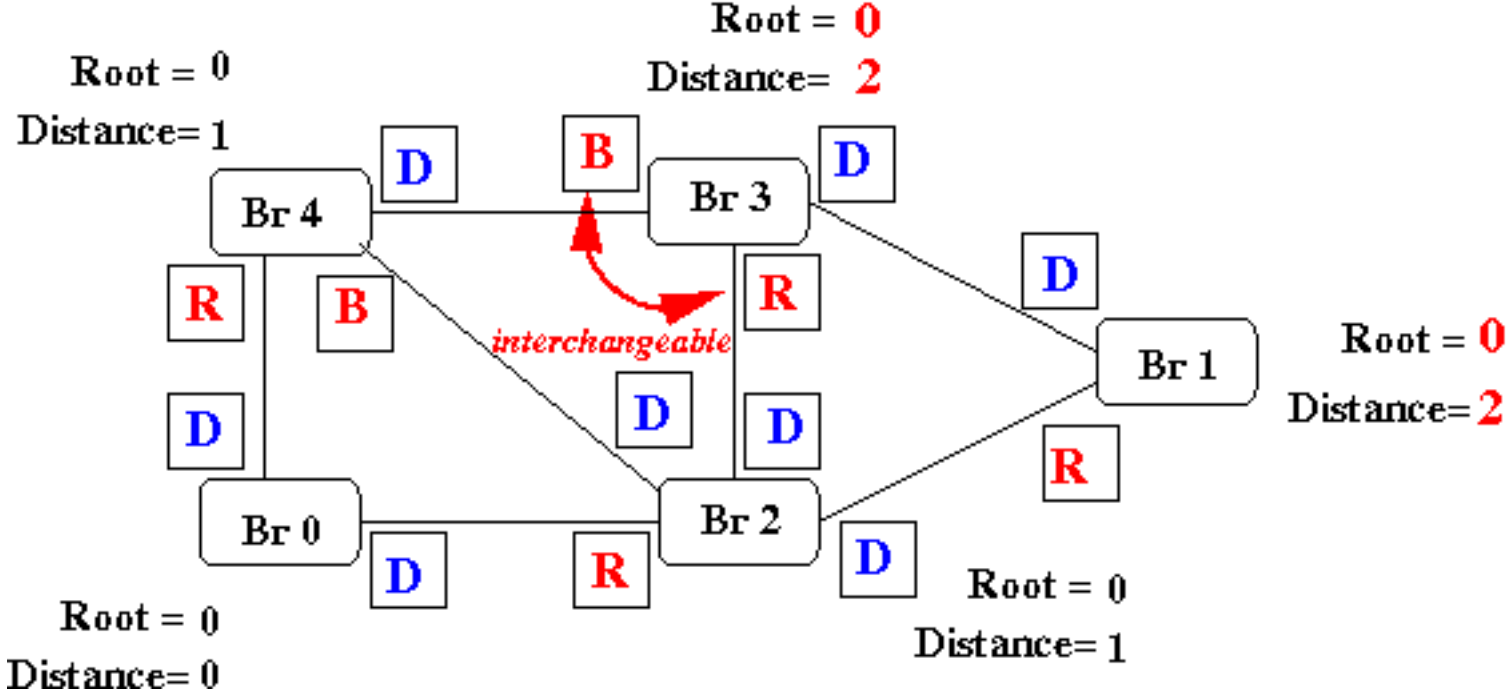
Give the **state of the ports** in the above figure (10 pts).




2. Give the configuration control messages sent by each bridge in the state given above (10 pts)

   - Bridge 0: (id=0, root=0, dist=0)
   - Bridge 1: (id=1, root=1, dist=0)
   - Bridge 2: (id=2, root=0, dist=1)
   - Bridge 3: (id=3, root=3, dist=0)
   - Bridge 4: (id=4, root=0, dist=1)

3. Show the values of the state variables of the bridges after the configuration control messages that were transmitted in **part 2 (above)** have been processed: (10 pts)

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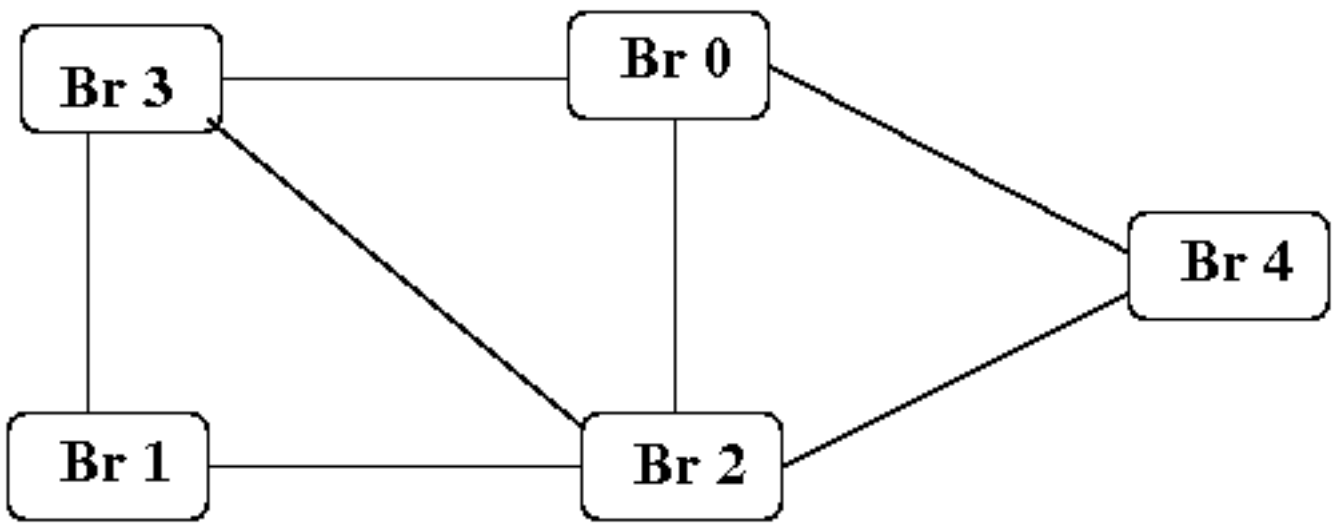
## Question 3 (30 pts)

Consider a **different** network topology (the bridges are shuffled)

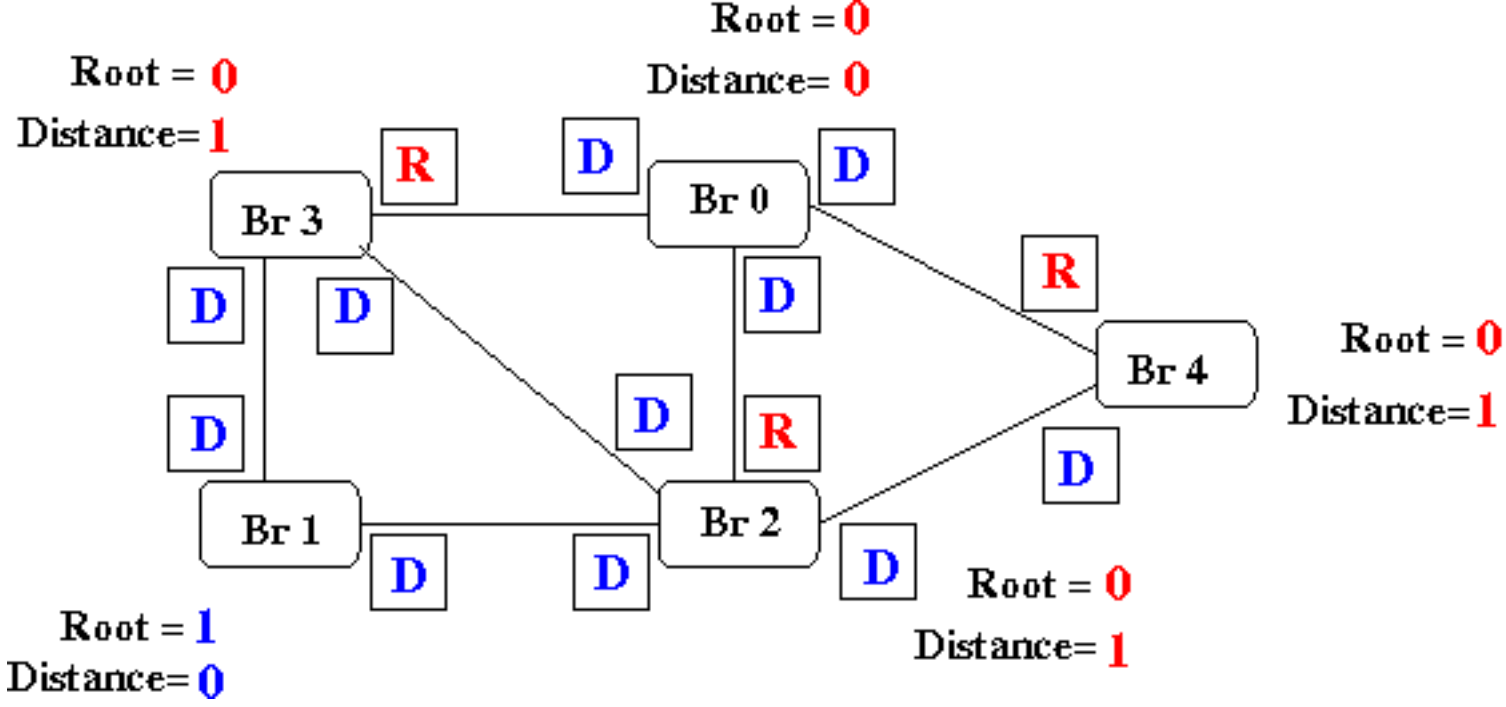



**Questions:**

1. Give the configuration control messages sent by each bridge when the bridge starts up. (10 pts)

   - Bridge 0: (id=0, root=0, dist=0)
   - Bridge 1: (id=1, root=1, dist=0)
   - Bridge 2: (id=2, root=2, dist=0)
   - Bridge 3: (id=3, root=3, dist=0)
   - Bridge 4: (id=4, root=4, dist=0)

2. Show the values of the state variables of the bridges after the configuration control messages that were transmitted in **part 1 (above)** have been processed: (10 pts)




3. Show the values of the state variables of the bridges after the **Spanning Tree Algorithm** has **converged** to the **final state**: (10 pts)