Coding Challenge

Hexaland is a fictitious country affected by COVID-19. Their government has divided the whole country into small uniquely named hexagons of equal size. Each hexagon can be connected to upto 6 other hexagons along their 6 borders. Each border of a hexagon is numbered as shown in Diagram 1.1. Notice how in Diagram 1.2, **ax** is connected to **bx** via its border 1 while **bx** is connected to **ax** via its border 4.

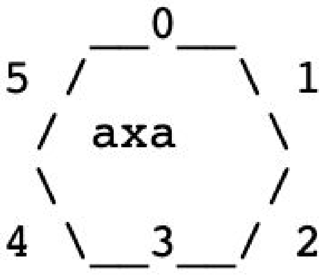

Diagram 1.1: Numbering Convention of Hexagon's borders

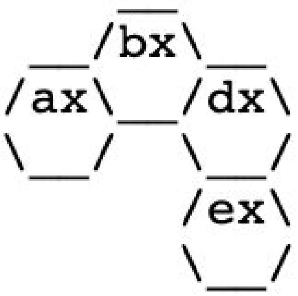

Diagram 1.2: Sample cluster

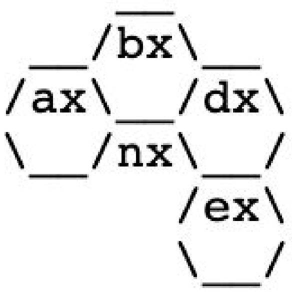

Diagram 1.3: Sample cluster

Hexaland's government wants an app that helps them keep a tab on growth of connected hotspots in a cluster. Diagram 1.2 shows how a cluster looks like.

They want the ability to do the following -

1. Querying a hexagon by its name should give the name of its neighbors and the border number shared with them. e.g. neighbors of **bx** in diagram 1.2 are [(2, **dx**), (4, **ax**)]

2. Add a new hexagon to the cluster by specifying an existing hexagon neighbour present in the cluster and the border number e.g. imagine adding a new hexagon **nx** to the sample cluster (refer Diagram 1.3) as a neighbor of **ax** at its border 2. Once added, querying neighbors of **dx** would result in [(3, ex), (4, nx), (5, bx)]

3. Whenever a hexagon in a cluster becomes COVID free, they would like to remove it from the cluster by specifying its name. Post removal, Not only would the hexagon cease to exist in the cluster, it won't figure out as a neighbor when its neighbors are queried. Note that a hexagon would never be removed from the cluster if it's the ONLY connecting hexagon between two hotspots. e.g. **bx** cannot be removed in diagram 1.2 even if it becomes COVID free because it's the only link between **ax** and **dx**.