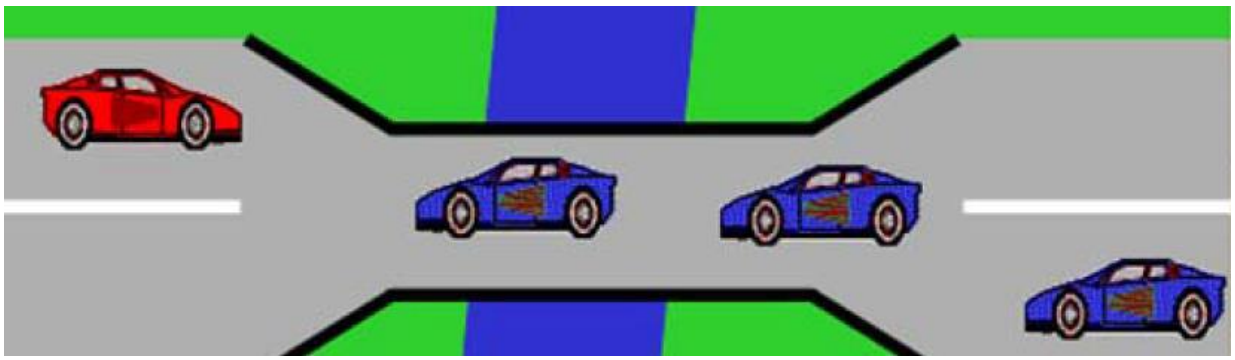
Single lane bridge



A bridge over a river is only wide enough to permit a single lane of traffic. Cars can only move concurrently if they are moving in the same direction. (A safety violation occurs if two cars moving in different directions enter the bridge at the same time).

The bridge is implemented as a thread-safe class (with the necessary synchronization mechanisms) implementing the interface.

```
public interface Lane
{
  void enterFromTheLeft();   // allowed, when no cars from the right are on the lane
  void exitToTheRight();     // a car has left the lane to the right
  void enterFromTheRight(); // allowed, when no cars from the left are on the lane
  void exitToTheLeft();      // a car has left the lane to the left
}
```

Blue cars and red cars are simulated by threads.

Question A

Implement a thread-safe class `Bridge` implementing interface `Lane` (don't worry about starvation)

Question B

Implement two thread classes:

- A thread class, `BlueCar`, which simulates cars from right.
- A thread class, `RedCar`, which simulates cars from left.

Question C

Implement a class with a main method to simulate the bridge with many car threads.

(Extra Exercise)

Verify that your solution to the previous exercise could include starvation. Implement a new version without starvation. Find a strategy first.