

7.11

A.

Mutually exclusive: only one line of vehicles (processes) can use roads (resources) at a time.

Waiting: each vehicle (process) holds a resource (Road) and waits to obtain the road (resource) to be moved held by other vehicles (process).

No preemption: the only condition that the road (resource) can be released is that all vehicles (processes) holding the resource are moved, which means that the process has been completed.

Cycle waiting: assuming that the 4 vehicles are in the set {L1, L2, L3, L4} respectively, it is obvious that L1 is waiting for the road (resources) held by L2, L2 is waiting for the road held by L3, L3 is waiting for the road held by L4, and L4 is waiting for the road held by L1.

B

Vehicles cannot stay at the intersection, which can avoid deadlock.

Programming Projects

The output diagram of ./a.out 10 5 7

```
[liusendongdeMacBook-Pro:CH7 liusendong$ ./a.out 10 5 7
Available:
10 5 7
Maximum:
1 5 4 3 3 2 10 2 7 5 3 0 5 2 6
Allocation:
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Need:
1 5 4 3 3 2 10 2 7 5 3 0 5 2 6 unsafe
```

The Process diagram of Banker's Algorithm

