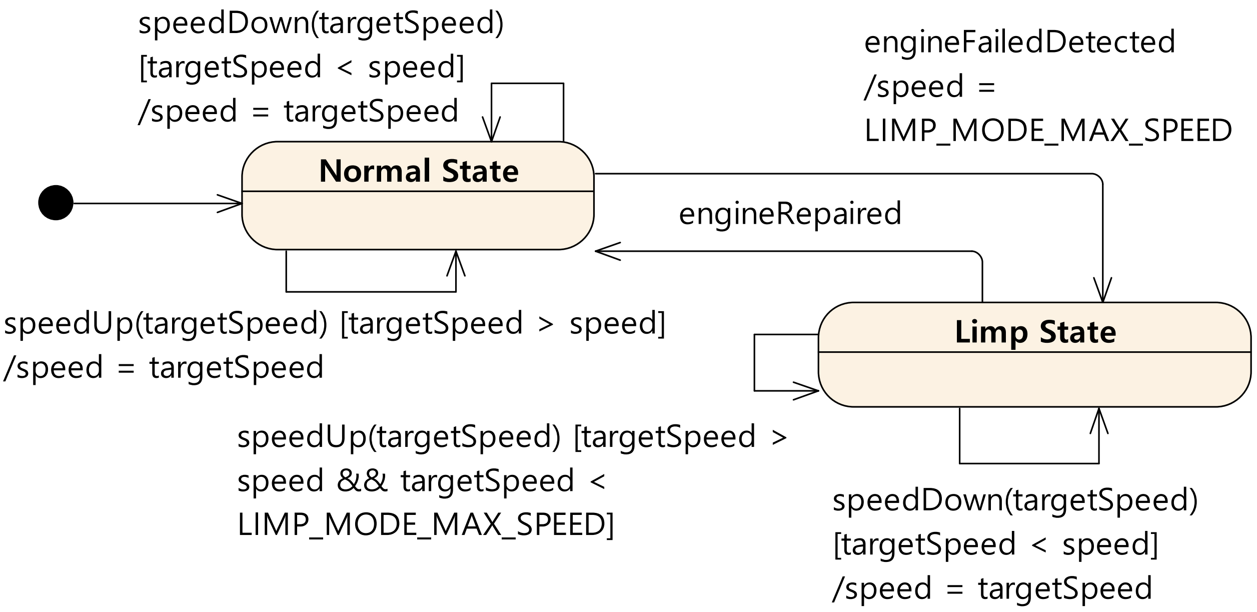
PRACTICE – CAR

Car

- Car's behavior depends on its state: Normal and Limp



speedDown(targetSpeed)
[targetSpeed < speed]
/speed = targetSpeed

engineFailedDetected
/speed =
LIMP_MODE_MAX_SPEED

Normal State

engineRepaired

Limp State

speedUp(targetSpeed) [targetSpeed > speed]
/speed = targetSpeed

speedUp(targetSpeed) [targetSpeed >
speed && targetSpeed <
LIMP_MODE_MAX_SPEED]

speedDown(targetSpeed)
[targetSpeed < speed]
/speed = targetSpeed

Source Code - Car

```java
public class Car {
  enum CarState { Normal, Limp }
  private static final int LIMP_MODE_MAX_SPEED = 60;
  private int speed;
  private CarState state;

  public Car() { state = CarState.Normal; speed = 0; }
  public void speedUp(int targetSpeed) {
    if (state == CarState.Normal) {
      if (targetSpeed > speed) speed = targetSpeed;
      else {
        if (targetSpeed > speed && targetSpeed < LIMP_MODE_MAX_SPEED)
          speed = targetSpeed;
        else speed = LIMP_MODE_MAX_SPEED;
      }
  }
```

Source Code - Car

```
  public void speedDown(int targetSpeed) {
    if (speed > targetSpeed) {
      speed = targetSpeed;
      return;
    }
  }

  public void enigineFaultDetected() {
    if (state == CarState.Normal) {
      state = CarState.Limp;
      speed = LIMP_MODE_MAX_SPEED;
    }
  }

  public void engineRepaired() {
    if (state == CarState.Limp) state = CarState.Normal;
  }

  public void setSpeed(int speed) { this.speed = speed; }
  public int getSpeed() { return speed; }
}
```

Source Code - Client

```
public class Client {
  public static void main(String[] args) {
    Car car = new Car() ;

    car.speedUp(150) ;
    car.speedDown(130) ;

    car.engineFailedDetected() ;

    car.speedUp(100) ;
    car.speedDown(30) ;
    car.speedUp(50) ;
    car.speedUp(100) ;

    car.engineRepaired() ;
    car.speedUp(100) ;
  }
}
```

```
Speed: 0 ==> 150
Speed: 150 ==> 130
Speed: 130 ==> 60
Speed: 60 ==> 60
Speed: 60 ==> 30
Speed: 30 ==> 50
Speed: 50 ==> 50
Speed: 50 ==> 100
```

Design

Source Code - CarState

Source Code - NormalState

Source Code - LimpState

Source Code - Car