1. 다음 문제를 해결하시오.

1. 사용가능한 Simulation 도구: 가용한 Software(Matlab, R, Arena, Excel 등) 선택
2. Simulation한 코드 제출
3. 자세한 Simulation 설명을 반드시 붙일 것

   (Simulation 화면 캡쳐 등)
4. 제출기한 : 4월 23일 24시한(KLMS)

Consider a car-rental system shown in Fig, with all distances given in miles. People arrive at location i $(where\ i = 1, 2, 3)$ with independent exponential interarrival times at respective rates of 14, 10 and 24 per hour. Each location has a FIFO queue with unlimited capacity. There is one bus with a capacity of 20 people and a speed of 30 miles per hour. The bus is initially at location 3(car rental), and leaves immediately in a counterclockwise direction. All people arriving at a terminal want to go to the car rental. All people arriving at the car rental want to go to terminals 1 and 2 with respective probabilities 0.583 and 0.417. When a bus arrives at a location, the following rules apply:

1. People are first unloaded in a FIFO manner. The time to unload on person is distributed uniformly between 16 and 24 seconds.

2. People are then loaded on the bus up to its capacity, with a loading time per person that is distributed uniformly between 15 and 25 seconds.

3. The bus always spends at least 5 minutes at each location. If no loading or unloading is in process after 5 minutes, the bus will leave immediately.

Run a simulation for 80 hours and gather statistics on:

(1) Average and maximum number in each queue

(2) Average and maximum delay in each queue

(3) Average and maximum number on the bus

(4) Average, maximum, and minimum time the bus is stopped at each location

(5) Average, maximum, and minimum time for the bus to make a loop(departure from the car rental to the next such departure)

(6) Average, maximum, and minimum time a person is in the system by arrival location.

Use the following random-number stream assignments:

i, interarrival times at location i $(where\ i = 1, 2, 3)$

4, unloading times

5, loading times

6. determining destination of an arrival at the car rental

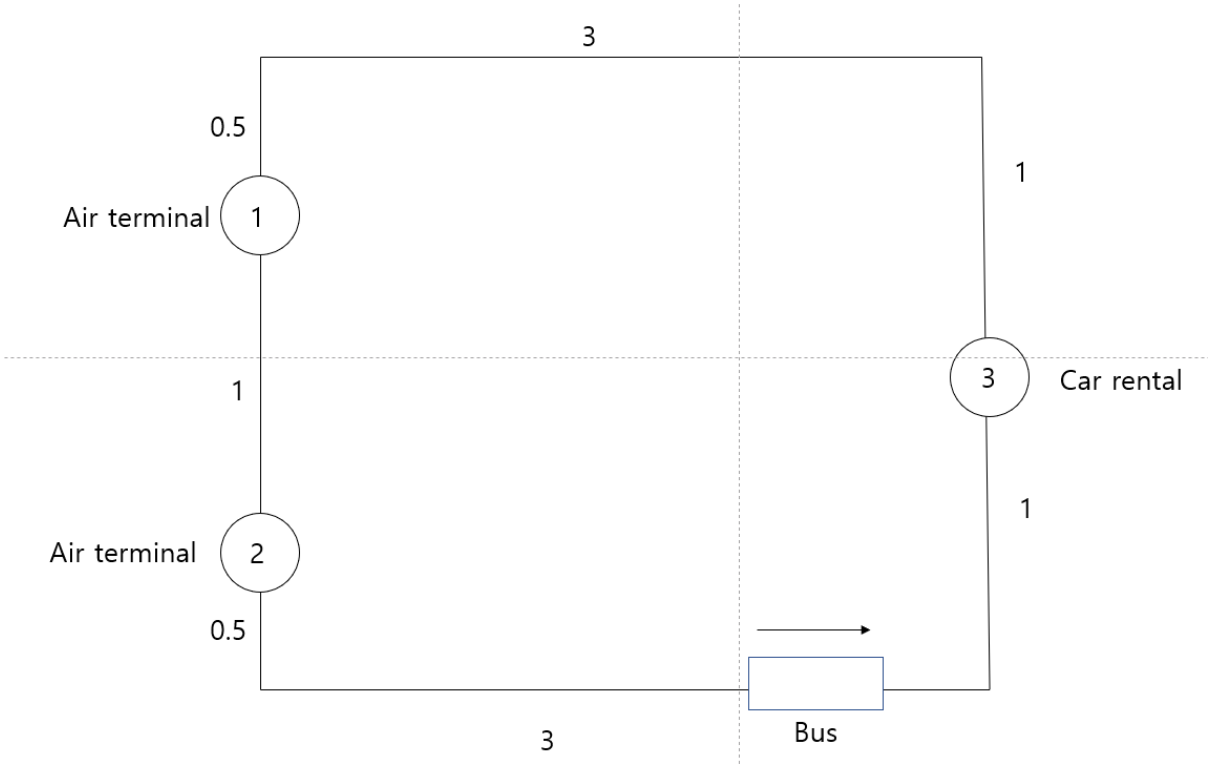

Fig. Car rental system