Lab 6
Mode Choice (3) - Simulation

Yufeng Zhang
zhan4879@umn.edu

CEGE-3201: Transportation Engineering

February 28, 2019

University of Minnesota

Announcements

- Report 2 (Lab 4, 5, and 6) due March 6th (Wed.)

Objectives

- Simulate discrete choice outcomes
- Compare simulation results and actual results
- Write for-loop using R

Simulation

Represents the randomness/stochasticity of real life discrete choices.

According to some MNL model, we get the following probabilities:
$P(Bus) = 0.194$, $P(Air) = 0.331$, $P(Train) = 0.475$.

Simulation methods:

- Generate a random number r between 0 and 1 using uniform distribution;
- If $r < 0.194$, pick mode "Bus";
- If $0.194 < r < 0.194 + 0.331 = 0.525$, pick mode "Air";
- If $r > 0.525$, pick mode "Train".

One run of simulation.
What happens if you simulate 50 times?
What about 1000 times?

R for-loop

```
sim_results<-c()   # a list for storing results
for (i in 1:N){    # N is number of simulation
    runs
  r <- runif(1)    # random uniform distribution
  if ( r < 0.194){
    sim_results<-c(sim_results, "bus")
  }
  else{
    if (r < 0.525){
      sim_results<-c(sim_results, "air")
    }
    else{
      sim_results<-c(sim_results, "train")
    }
  }
}
```

After simulation

Create pie charts.

```
table(sim_results) # get counts for each mode
slices<- c(20, 30, 50)
lbls<- c("Bus 0.2", "Air 0.3", "Train 0.5")
pie(slices, labels = lbls, border = TRUE, main=
   "Pie Chart of Mode Choice")
```