MTH 371: Assignment I

September 26, 2018

Instructions

- Use statistical software R for your codes.
- Due date is October 11, 2018 (6 p.m.). No late assignments will be accepted.
- Submit all of your work which include the codes, results and graphs.

1. A printer prints one page at a time with probability $p = 0.8$. The time units are discrete and the job of print is independent of the other. Simulate the process for a finite time $T = 30$. Also, simulate the distribution of first interarrival time and plot the cumulative distribution function. (5 points)

2. The accidents happen on three independent highways of USA. The rate of accident on the highway in Texas is 1 accident per day. On the highway in Florida it is 3 accidents per day while on the highway in Colorado it is 5 accidents per day. Simulate the process for all the three highways. Plot the sum of the interarrival times of the highways in 50 days. On a separate graph plot the total number of accidents of the highways. (5 points)

3. There is a facility center which admits both female and male patients. The rate of admission of females is 2 patients per month while that of the males is 3 patients per month. The interarrival times are IID and the time is $t > 0$. We want to generate and study the processes for 20 months. Compare the sum of interarrival times and total arrival of the males and females separately and also when combined. (10 points)