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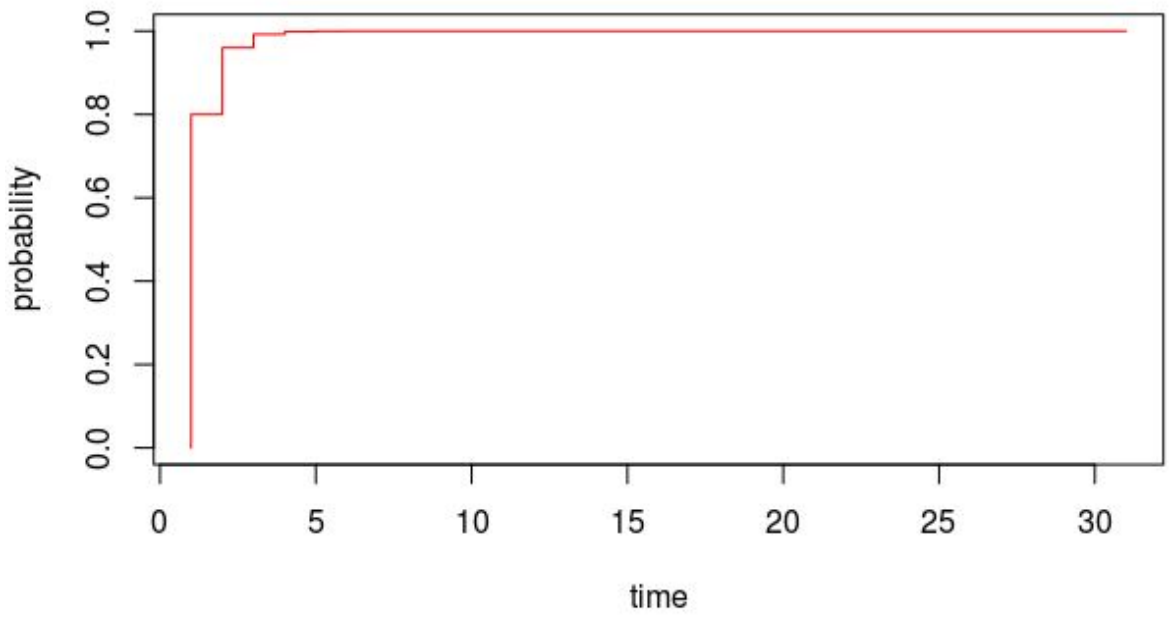
Question 1
Process simulation for a finite time of 30 is done by using the function rbinom(. . .)
In which the no of trials = 1
And other parameters are T= 30 and p = 0.8
Thus ,
rbinom(30,1,0.8) gives -

[1] 1 1 1 1 0 0 1 1 1 1 0 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

Simulation of first interarrival time is done by using pgeom as we need the cdf, thus
First interarrival times are given by : pgeom(0:30,0.8)
0:30 gives the interarrival times as
[1] 0.0000000 0.8000000 0.9600000 0.9920000 0.9984000 0.9996800 0.9999360 0.9999872
0.9999974 0.9999995 0.9999999 1.0000000
[13] 1.0000000 1.0000000 1.0000000 1.0000000 1.0000000 1.0000000 1.0000000
1.0000000 1.0000000 1.0000000 1.0000000 1.0000000 1.0000000
[25] 1.0000000 1.0000000 1.0000000 1.0000000 1.0000000 1.0000000 1.0000000

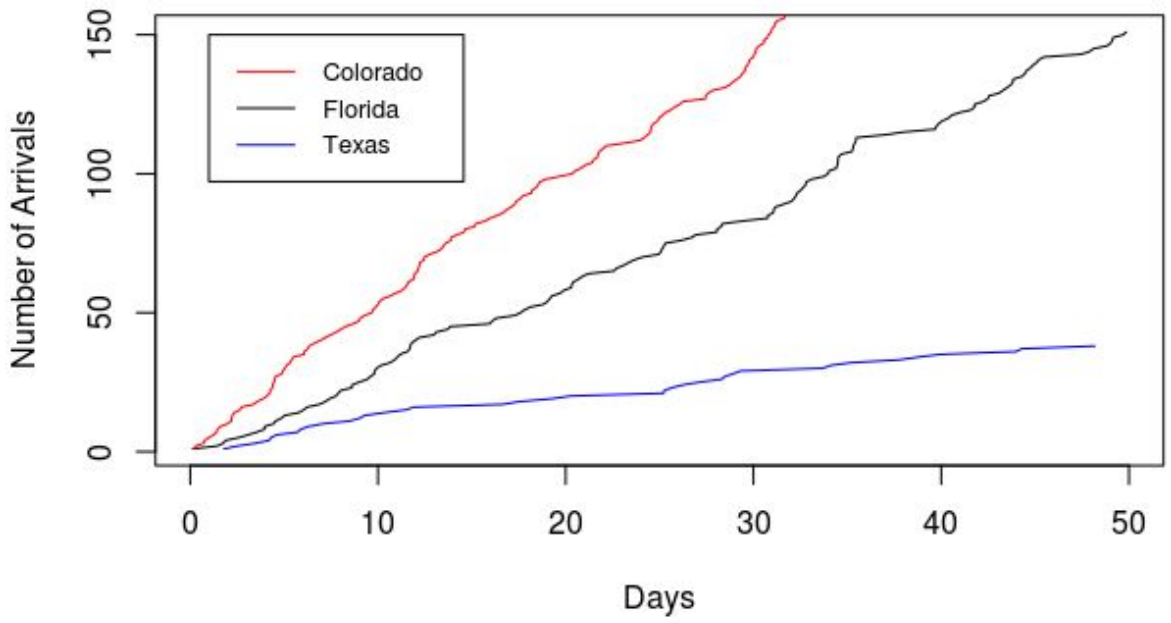
And then we plot these values which gives us the cdf as a step function



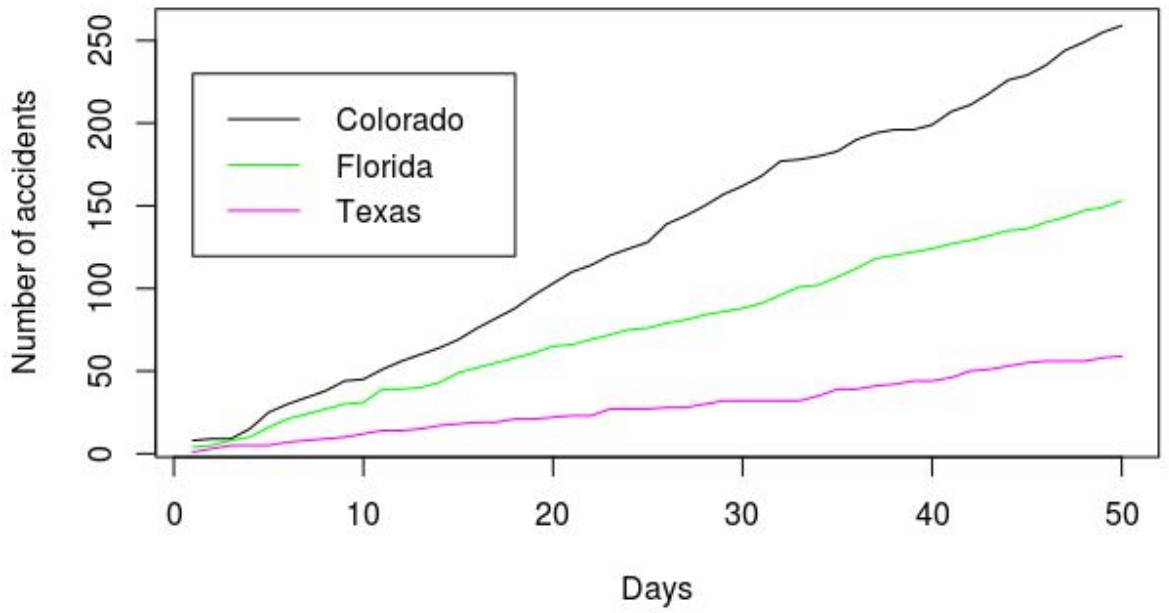
Question 2

We simulate the poisson process using interarrival times

1. Generate 1000 random exponentials
2. 2. Find cumulative sums of interarrival times that gives Sn ‘s (sum of interarrival times)
3. We stop where the value of Sn exceeds 50
4. And finally plot the sums of interarrival times



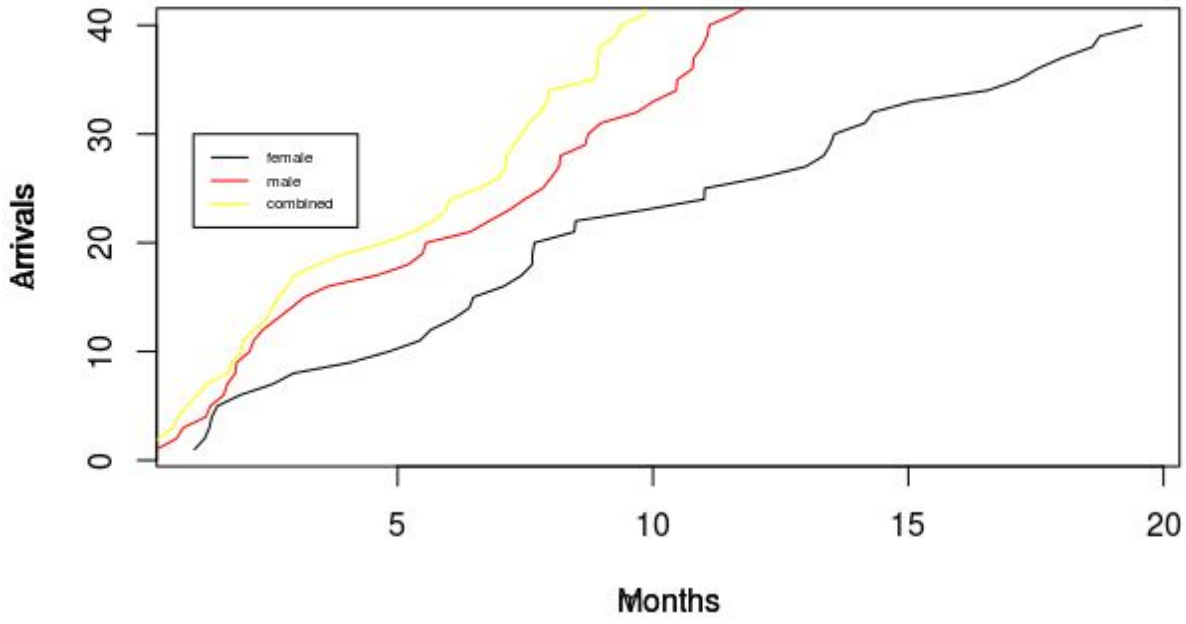
We repeat the processes differently for each of the three highways having rate = 1, 3 and 5 Then for no of accidents for each of the three highways we find the no of accidents till T=1 and upto 50 . plotting which gives :



Question 3

We simulate the poisson process using interarrival times

5. Generate 1000 random exponentials
6. 2. Find cumulative sums of interarrival times that gives Sn ‘s (sum of interarrival times)
7. We stop where the value of Sn exceeds 20
8. And finally plot the sums of interarrival times



We repeat the processes differently for each of the rates = 2, 3 and combined rate would be sum of rates of male and female = 5
Similarly we plot No of arrivals as done in the previous question.