Stochastic Processes 160B, Week 2

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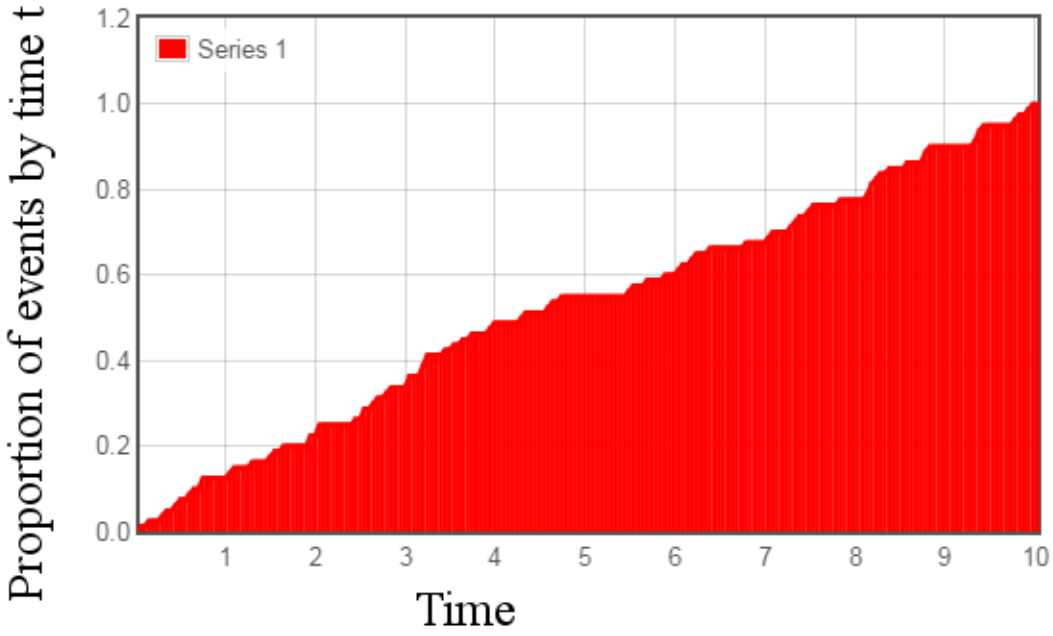
January 20, 2016

Part A

This program simulates a Poisson Process via the method introduced in class. It produced the following CDF:



In this particular simulation, there were 80 events.

Part B

My program then finds a time T based on the Pareto distribution, and finds $N(T)$:

```
At time T =  [ 1.320853] , N(T) =  15
```

Part C

Then it generates 1,000 Ts, finds their $N(T)$s, and uses the data to estimate some parameters:

```
In 1,000 trials, the average value of N(T) was  6.5425425425425585
Estimated Variance:  104.1128596645282
Estimated Covariance:  [ 8.92682583]
```

Part D

Finally, my program repeats this process 100 times and finds the standard error of our Monte Carlo estimation of mean, variance, and covariance:

```
In 100 trials of 1,000 trials, the standard error of the mean was  0.17517256099750306
In 100 trials of 1,000 trials, the standard error of the variance was  9.076326119914938
In 100 trials of 1,000 trials, the standard error of the covariance was  [ 2.52272558]
```

Having run the program several times, these answers seem generally accurate and consistent.