ISC 5228
Markov Chain Monte Carlo
In-class Assignment

Probability Distributions

(i) Exponential: Suppose you are planning on running a parallel job on an HPC with $n = 128$ CPUs. Let the average failure rate for a processor be $\lambda = 0.01/$ year. Your program is not fault tolerant, so it fails if any of the the n (independent) CPUs fails. On average, how many days do you expect your job to run before encountering a problem. **Hint**: The failure rate of n independent processes is $n\lambda$.

(ii) Poisson: Hurricanes hit Florida, on average, two times per year. Find the probability that in a given year 3 or more hurricanes hit Florida.

(iii) Binomial: It is estimated that 4,000 of the 10,000 voters in a town are against a new sales tax. If 15 voters are randomly selected, what is the probability that more than half favor the new tax?