**Applied Bayesian Statistics**

**Practice on the mass probability function, likelihood function, kernel and normalizing constant, maximum likelihood estimation.**

Suppose that a trucking company owns a large fleet of well-maintained trucks and assume that breakdowns appear to occur at random times. The president of the company is interested in learning about the **current daily rate** at which breakdowns occur.

* What is the probability mass function that describes the number of daily breakdowns?
* Yesterday, the number of breakdowns is observed and found to be 5 breakdowns. What is the likelihood function of the parameter we are interested in?
* What is the kernel and normalizing constant of the **mass** probability function?
* What is the kernel and normalizing constant of the **likelihood** function?
* Graph the likelihood function - You may do it “by hand” by calculating the likelihood for the values 0.5, 1, 2, 4, 5, 7, 8, 12, and 16 and connect the points with a smooth curve.
* From the likelihood function plot, find the maximum likelihood value of the parameter.