

Poisson Examples:

1. Number of accidents happening on a road in a certain period of time
2. Number of defects in an item piece
3. Number of arrivals at a particular counter in a certain period of time
4. Number of calls received by a customer care division in a certain period of time
5. Number of requests processed in a certain period of time

1. The number of calls received per day by a Customer Care division is observed to follow Poisson Distribution with mean calls as 56. Find the following:
 - a) Probability that it may get more than 70 calls in a day
 - b) Probability that less than 20 calls are received in a day

```
poisson.sf(70, 56)
0.029824687242845115

poisson.cdf(19, 56)
9.647463412493e-09
```

2. The number of customers served at a counter per hour are 4. Find the following:
 - a. Probability that more than 5 customers will be served in an hour
 - b. Probability that less than 3 customers will be served in an hour

```
poisson.sf(5, 4)
0.2148696129695948

poisson.cdf(2, 4)
0.23810330555354436
```

1. The number of customer returns in a retail chain per day follows a Poisson distribution at a rate of 25 returns per day. Write Python code to answer the following questions:
 - (a) Calculate the probability that the number of returns exceeds 30 in a day.
 - (b) If the chance of fraudulent return is 0.05, calculate the probability that there will be at least 2 fraudulent returns in any given day.

```
poisson.sf(30, 25)  
0.1366911308473363  
  
poisson.sf(1, 0.05)  
0.001209104274250291
```