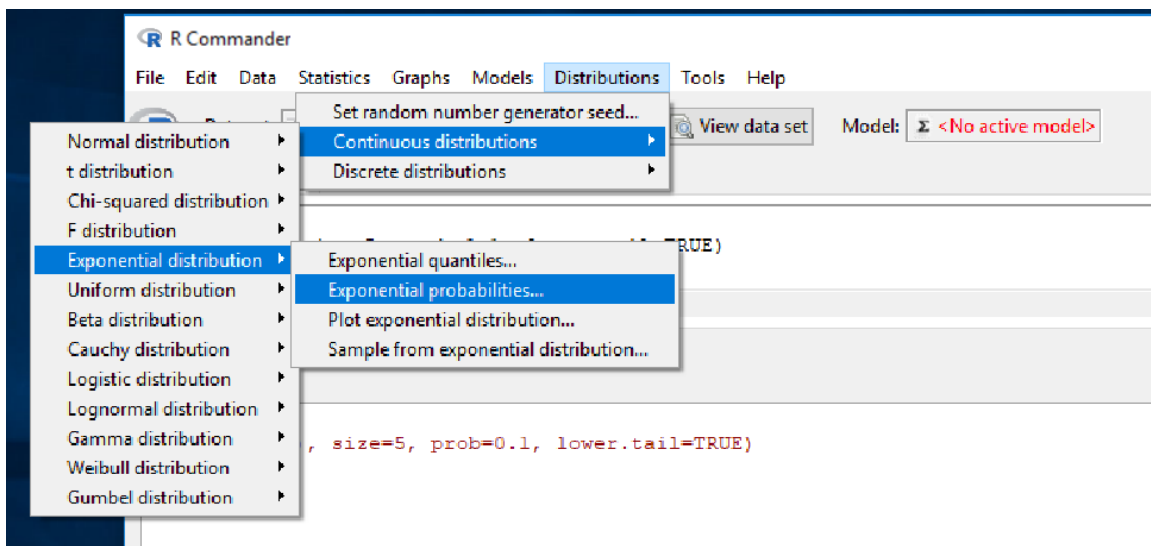


Exponential Probabilities

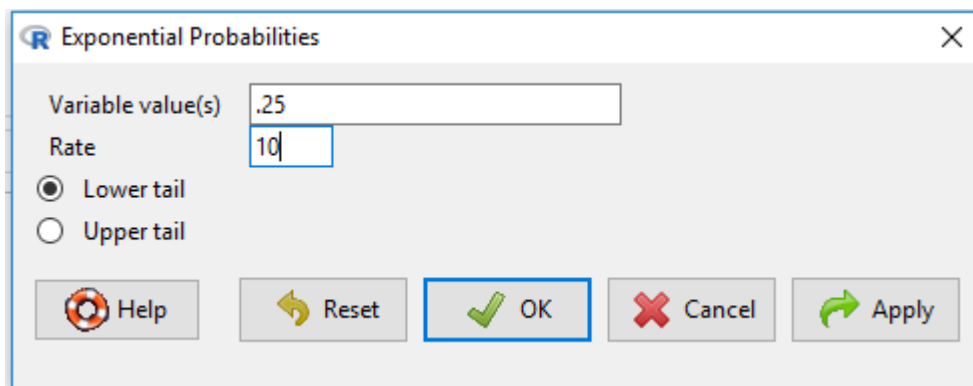
For this example we will analyze a specific Exponential Probability problem.: Suppose that number of arrivals of customers follows a Poisson process with a mean of 10 per hour. What is the probability that the next customer will arrive within 15 minutes? (15 min. = .25 hour)

1) To utilize R Commander to solve the probability: first select through the following menu selections:

**Distributions -> Continuous Distributions -> Exponential distribution
-> Exponential probabilities**



2) Enter the Data from the problem in the R Commander window as shown below:



- 3) From this problem the Rate is the **10** for the amount of customers arriving per hour. The variable value of **0.25** is the 15 minutes converted into hours to be of the same unit as the rate. **15 min = 0.25 hr**
Select **Lower tail** because it is asking the “within 15 minutes” which is less than 15 minutes. And then, **CLICK OK**.

Interpret the Results:

```
> pexp(c(.25), rate=10, lower.tail=TRUE)
[1] 0.917915
```

This result means: With customers arriving on a mean of 10 per hour, there is 91.8% probability that the next customer will arrive within 15 minutes.

Remark: If **upper tail** option is chosen then the probability of great than 15 minutes, that is $P(X>15)$, will be computed.