PDF
Evaluating Probabilities from Various Distributions

This workbook can be used to evaluate probabilities for various probabilities: Select the appropriate sheet and enter your parameters, etc, in place of the example data. Various probabilities, etc, are computed.

Sheets

- **Beta**: Beta distribution
- **Bino**: Binomial distribution
- **Chisq**: Chisquare distribution
- **Exp**: Exponential distribution
- **F**: F distribution
- **Gamma**: Gamma distribution
- **Hypgeom**: Hypergeometric distribution
- **Lognormal**: Lognormal distribution
- **Normal**: Normal distribution
- **Poisson**: Poisson distribution
- **T**: T distribution
- **Weibull**: Weibull distribution
- **User defined**: User defined (discrete) distribution

Cells that you may alter are **blue** - others should not be changed. Do not Cut, Move or Delete cells. Do not change the name of the workbook.

Help is obtained by double-clicking on any**red** cell. Read XLStats.doc for more information and examples.

You can speed up calculations on a sheet by choosing not to draw graphs of the probability function.

Rodney Carr, 1997-2005

Beta Distribution (for a variable X)

Parameters

Alpha (α)	0,5
Beta (β)	0,5
A	0
B	1

Probability

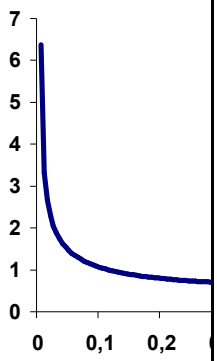
Value of Variable (x) =	0,5
P(X = x) =	0
P(X ≤ x) =	0,5
P(X ≥ x) =	0,5

Inverse Probability

P(X ≤ x) =	0,3
x =	0,20611
P(X ≥ x) =	0,3
x =	0,79389

Graphs

Scale	
Left	0
Right	1



Extra Tools

Binomial Distribution (for a variable K)

Parameters

Number of Trials (n)	10
Probability of a Success (π)	0,16667

Probability

Number of "Successful" Outcomes (k) =	3
P(K = k) =	0,15505
P(K ≤ k) =	0,93027
P(K ≥ k) =	0,22477
P(K < k) =	0,77523
P(K > k) =	0,06973

Inverse Probability

P(K ≤ k) ≥	0,1
Smallest k for which this is True =	0
P(K ≥ k) ≥	0,1
Largest k for which this is True =	3

Graphs

Scale	
Left	0
Right	10

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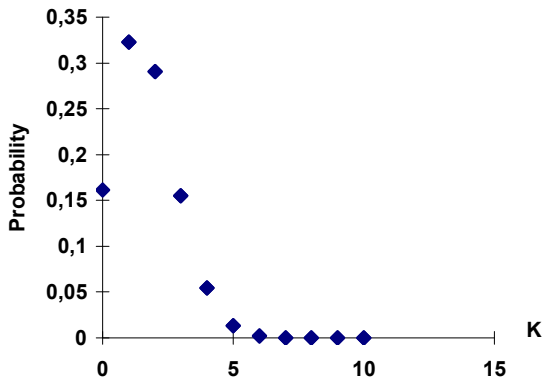


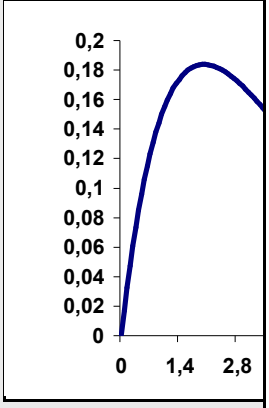
Chi-Square Distribution (for a variable X)

Parameters	
Degrees of Freedom (DF)	4

Probability	
Value of Variable (x) =	5,3
P(X = x) =	0
P(0 ≤ X ≤ x) =	0,74212
P(X ≥ x) =	0,25788

Inverse Probability	
P(X ≤ x) =	0,95
x =	9,48773
P(X ≥ x) =	0,05
x =	9,48773

Graphs	
Scale	
Left	0
Right	14



Exponential Distribution (for a variable T)

Parameters

Failure Rate (λ)	0,15

Probability

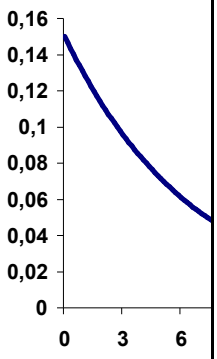
Value of Variable (t) =	6,7
P(T = t) =	0
P(0 ≤ T ≤ t) =	0,63396
P(T ≥ t) =	0,36604

Inverse Probability

P(T ≤ t) =	0,95
t =	19,9715
P(T ≥ t) =	0,05
t =	19,9715

Graphs

Scale	
Left	0
Right	30



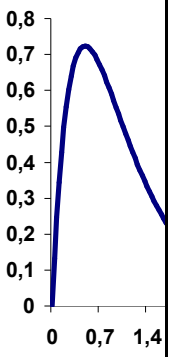
F Distribution (for a variable F)

Parameters	
Numerator Degrees of Freedom	4
Denominator Degrees of Freedom	60

Probability	
Value of Variable (f) =	3,52
P(F = f) =	0
P(0 ≤ F ≤ f) =	0,98799
P(F ≥ f) =	0,01201

Inverse Probabilify	
P(F ≤ f) =	0,95
f =	2,52522
P(F ≥ f) =	0,05
f =	2,52522

Graphs	
Scale	
Left	0
Right	7



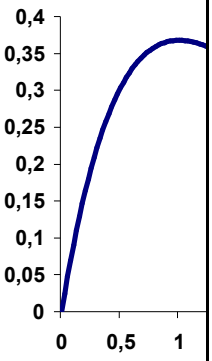
Gamma Distribution (for a variable X)

Parameters	
Alpha (α)	2
Beta (β)	1

Probability	
Value of Variable (x) =	2
P(X = x) =	0
P(X ≤ x) =	0,59399
P(X ≥ x) =	0,40601

Inverse Probability	
P(X ≤ x) =	0,3
x =	1,09735
P(X ≥ x) =	0,3
x =	2,43922

Graphs	
Scale	
Left	0
Right	5



Hypergeometric Distribution (for a variable K)

Parameters

Number of Trials (n)	25
Number of Successes in Population (N_S)	15
Total Population Size (N)	200

Probability

Number of "Successful" Outcomes (k) =	5
P(K = k) =	0,02075
P(K ≤ k) =	0,99515
P(K ≥ k) =	0,02559
P(K < k) =	0,97441
P(K > k) =	0,00485

Graphs

Scale

Left	0
Right	15

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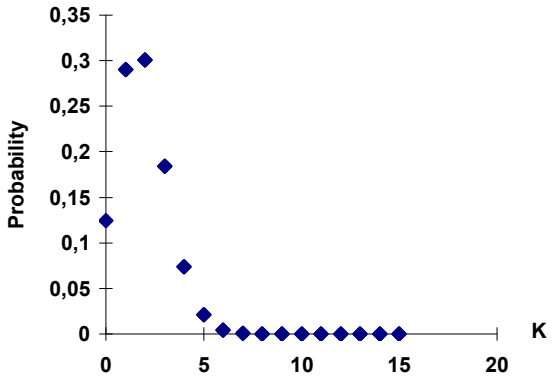


Lognormal Distribution (for a variable X)

Parameters

Mean of ln(X) (μ)	3,5
Standard Deviation of ln(X) (σ)	1,2

Probability

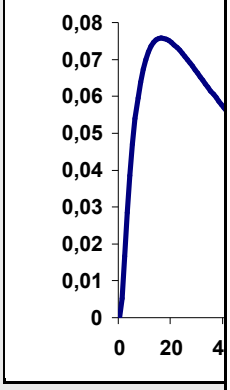
Value of Variable (x) =	60
P(X = x) =	0
P(X ≤ x) =	0,6898
P(X ≥ x) =	0,3102

Inverse Probability

P(X ≤ x) =	0,3
x =	17,6497
P(X ≥ x) =	0,3
x =	62,1332

Graphs

Scale	
Left	0
Right	200



Normal Distribution (for a variable X)

Parameters	
Mean (μ)	10
Standard Deviation (σ)	1,2

Probability	
Value of Variable (x) =	11
P(X = x) =	0
P(X ≤ x) =	0,79767
P(X ≥ x) =	0,20233
P(X between μ and x) =	0,29767

Inverse Probability	
P(X ≤ x) =	0,3
x =	9,37072
P(-x ≤ X ≤ x) =	0,95
x =	12,352
P(X ≥ x) =	0,3
x =	10,6293

Graphs

Scale	
Left	5
Right	15

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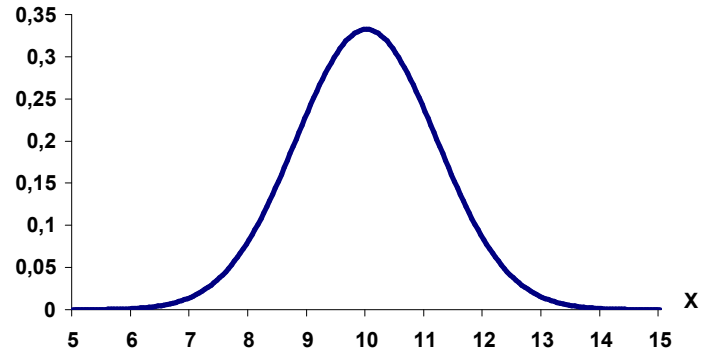
[ ] Shade cumulative probability



Extra Tools ⇨

Poisson Distribution (for a variable K)

Parameters

Average Number of Events (λ)	2

Probability

Number of Events (k) =	4
P(K = k) =	0,09022
P(K ≤ k) =	0,94735
P(K ≥ k) =	0,14288
P(K < k) =	0,85712
P(K > k) =	0,05265

Graphs

Scaling	
Left	0
Right	13

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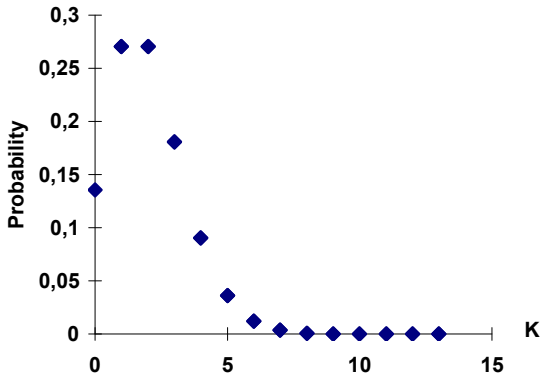


T Distribution (for a variable T)

Parameters

Degrees of Freedom (DF)	5

Probability

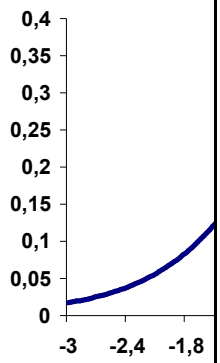
Value of Variable (t) =	1,1
P(T = t) =	0
P(T ≤ t) =	0,83927
P(T ≥ t) =	0,16073
P(-t ≤ T ≤ t) =	0,67855

Inverse Probability

P(T ≤ t) =	0,95
t =	2,01505
P(-t ≤ T ≤ t) =	0,95
t =	2,57058
P(T ≥ t) =	0,05
t =	2,01505

Graphs

Scale	
Left	-3
Right	3



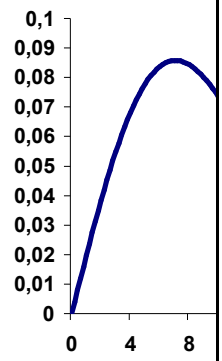
Extra Tools

Weibull Distribution (for a variable X)

Parameters	
Alpha (α)	2
Beta (β)	10

Probability	
Value of Variable (x) =	10
P(X = x) =	0
P(X ≤ x) =	0,63212
P(X ≥ x) =	0,36788

Graphs	
Scale	
Left	0
Right	40



User Defined Probability Distribution Function (PDF) (for a discrete variable X)

PDF

x	P(X=x)
0	0,15
1,2	0,3
4	0,2
6	0,2
7	0,15

Summaries

Total Prob.	1
μ	3,41
σ	2,56006

Probability

x	6
P(X = x) =	0,2
P(X ≤ x) =	0,85
P(X ≥ x) =	0,35
P(X < x) =	0,65
P(X > x) =	0,15

Graphs

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