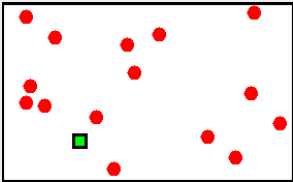
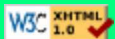
 <h2 style="text-align: center;">Distance to points in rectangle</h2> <p style="text-align: center;">Computes the distance from a given point to the others, in a rectangle.</p> <div style="text-align: right;"> <input type="button" value="Execute"/> 2014.Jul.06 01:42:13 </div>		
x, y	0.6 0.2	Location of given (source) point. •
b, h	2 1	Base and height of rectangle. •
N	1e+7 (≤ 1e+8)	No. of random destination points. •
.seed, klass	0 200	Seed for random numbers, and no. of histogram classes. •
Show values	No	Shows the coordinates of the graph. •
<p>Simulates, via Monte Carlo, the distances from the source point to N random points in a given rectangle, with base b and height h, in order to find the distribution of the distance, d. In the Figure, is shown a rectangle with the source point (square) and N (here, a few) random points.</p> <p>Plots the density function (pdf), $f(d)$, and the probability function (cdf), $F(d)$, for the distance, d, and computes its mean and standard-deviation. (The user given point can be <i>out</i> of the rectangle.)</p> <p>Other suggested data for (x, y): (0.2, 0.2), (1, 0.2), (2.6, 0.2)</p>		
<input type="button" value="Reset"/>	References:	Plate: distInRectang
<ul style="list-style-type: none"> • Dartmouth College, 2014, Chapter 2.pdf, "Continuous probability densities" • Weisstein, Eric W., "Disk Point Picking", <i>MathWorld</i>—A Wolfram Web Resource • 1838-01-05: JORDAN, Marie Ennemonde Camille (1922-01-22) (not Wilhelm Jordan, 1842–1899). 		



Results

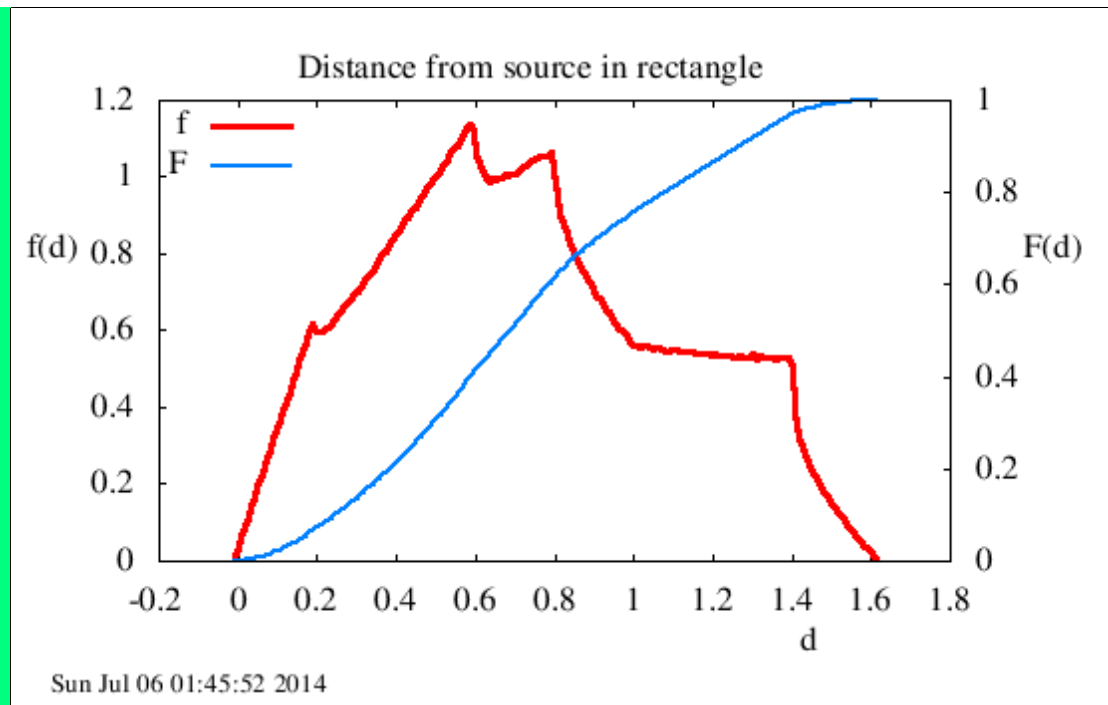
```

2014-07-06 UTC+0060  1:45:52.078
*** Distance from point in a rectangle ***                               (Jan-2014, MC)
                                                                                   [149914306]

Source point,      0.6000      0.2000      | (x, y)
Rectangle,        2.000      1.000      | base, height
No. of random points, N, 10000000 | = 10 ^ 7.00
.Seed (repeatability),      0      | (0|>=1: no|yes)
No. of histogram classes,    200    |
Show coord.s ?      0      | (0|1: no|yes)
-----|-----
Rectangle diagonal,      2.2361      |
Distances of source to vertices:
      1.414      1.612      |
      0.6325     1.000      |
Distance is in  0.0000     1.6125  |
Distance interval width,  1.6125  |
Dist. min, max, 3.50862E-04 1.6117 |
Aver., stdev,   0.73129    0.36291 |


2014-07-06 UTC+0060  1:45:52.078
2014-07-06 UTC+0060  1:45:52.911    "CPU":      0.8 sec.      End
                                         0d 00h 00m 0.88s

```



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 Packet filling, as tubes		<input type="button" value="Execute"/>	
Fills (via Monte Carlo) packets, as tubes, with items. SPE Nazaré/pt		2014.Jul.06 01:53:43	
L, U	<input type="text" value="2000"/> <input type="text" value="2080"/> g (specification limits)	<i>Lower, upper specs on packet weight (ΣX).</i> •	
μ, σ	<input type="text" value="100"/> <input type="text" value="3"/> g	<i>Mean and st. dev. for the weight of each item, X.</i>	
X_a, X_b	<input type="text" value="92"/> <input type="text" value="108"/> g ($0 < X_a < x < X_b$)	<i>Truncation X_a (min) and X_b (max) for item.</i> •	
Strategy	<input checked="" type="radio"/> none <input type="radio"/> FIFO	<i>Strategy: none or 'FIFO rectify'.</i> •	
$N, .seed$	<input type="text" value="1×10^6"/> <input type="text" value="0"/>	<i>No. of items ("lot size"), random no. gener. seed.</i> •	
tol, klass, y_{max}	<input type="text" value="1.-6"/> <input type="text" value="200"/> <input type="text" value="0"/> g ⁻¹ ['0' (≠ '0'), auto.]	<i>Tolerance, no. of histo. classes, max. y for graph.</i> •	
Show values	<input type="text" value="No"/>	<i>Shows the coordinates of the graph.</i> •	
<p> Simulates, via Monte Carlo, the filling of a packet ("bag") of items, in a tube-style, FIFO (first in, first out) strategy (as in a doubly open tube). The objective is a final filling with weight (mass) in (L, U). An example might be to fill a bag of 2 kg of oranges, namely (as in the base data), weighing between $L = 2000$ and $U = 2080$ g. </p> <p> The weight of each item is considered <i>truncated Gaussian</i>. (<i>Tolerance</i> is for the inversion of the Gaussian distribution.) </p> <p> Terminology for <i>fractions</i> (costs incurred): 'frTr', fr. truncated from the original product; 'frWa' (waste), fr. wasted as giveaway (weight above L); 'frRe' (rejected), fr. of unused items, possibly recyclable. </p> <p> Several other, better strategies (worthy of research) would be convenient to try to reach the final sum within the limits. </p>			
<input type="button" value="Reset"/>	<i>References:</i>	Plate: TubePacketFill3	
<ul style="list-style-type: none"> • "Calibrafruta", Leiria (Portugal). • 1900-04-12: YOU DEN, William John (1971-03-31). 			



<http://web.tecnico.ulisboa.pt/~mcasquilho/compute/qc/Fx-3tubefill.php>

Created: 2011-04-12 — Last modified: 2011-10-01

Results

2014-07-06 UTC+0060 1:58:11.237

*** Tube-style packet filling ***

(Apr-2011, MC)

.L, U,	2000.	2080.	specs for packet (total) weight
.mu, sigma,	100.0	3.000	for 'X'
x_a, x_b (tr.),	92.00	108.0	truncated Gaussian, X in (x_a, x_b)
Rectifying strategy,		0	(0: none)
No. of trials, N,		10 ⁶	= 1000000 (max int, 10 ^{9.33})
.Seed (repeatability),		0	(0 >=1: no yes)
No. of histogram classes,		200	tol, 1.0E-06 (for Gaussian inversion)
Show coord.s ?		0	(0 1: no yes)

mid_value, occup., 2040.	20.4	(occupancy ~= .mid_value / .mu)
--------------------------	------	---------------------------------

*** THEORETICAL *** truncated Gaussian			(_t, truncated)
a', b',	-2.667	2.667	[a' = (x_a - mu) / sigma, b' idem b]
.mu_t, sigma_t,	100.00	2.9067	for truncated X
D_mu, rho_sigma,	0.00	0.969	(mu_t-mu, sigma_t/sigma: from trunc.)
a', b',	-2.67	2.67	a' = (a - mu) / sigma, idem b'
Phi(a'), Phi(b'),	3.83E-03	0.9962	
deltaPhi,		99.234 %	(fraction retained)
Fraction truncated, frTr,		0.766 %	(= 1 - deltaPhi)
Packet occupancy:			from 18.52 to 22.61, i.e.,
items min, max,	19	22	[(L/b)+, (U/a)-]
L/max, U/min,	90.91	109.5	extreme equal X's ('x_a', 'x_b')

*** SIMULATED ***

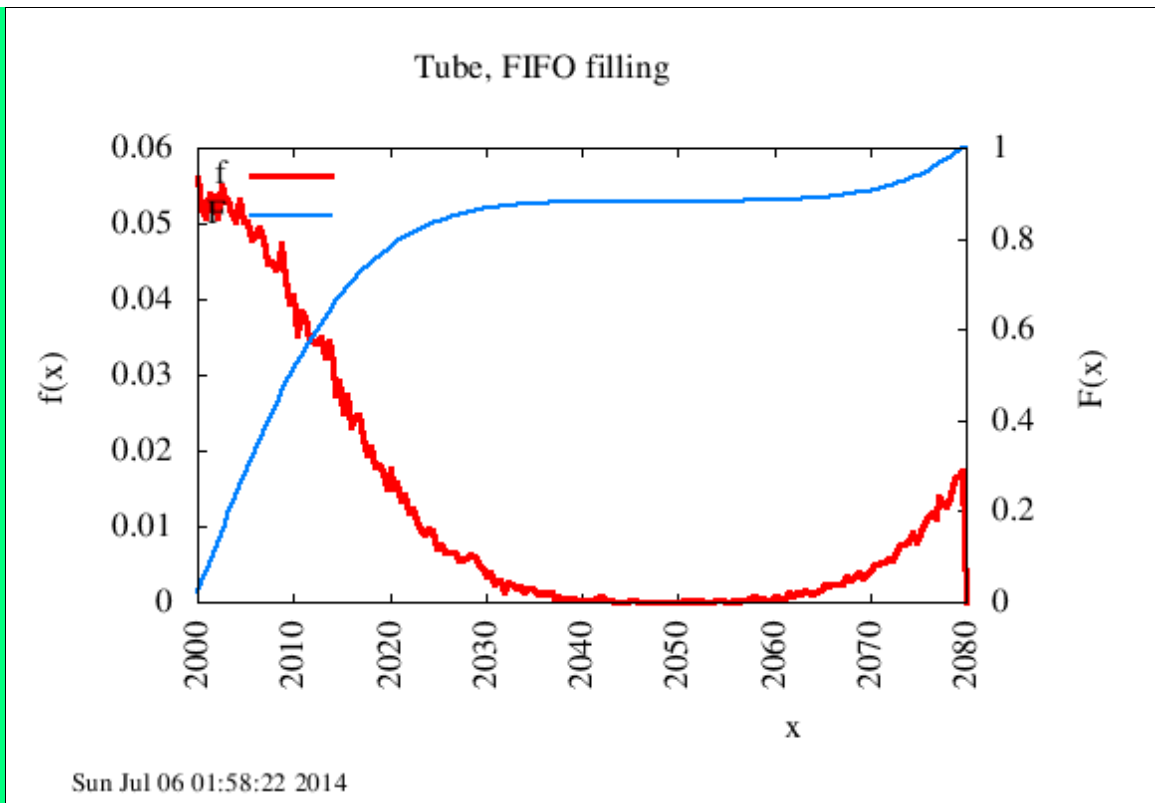
No. of data	average	stdev	(moments)
1000000	100.00	2.9098	all items
556344	100.30	2.9128	accepted items
27655	2017.8	21.883	packets
sigma_acc / sigma_all,		1.0010	(accepted vs. all)
Occupancy, frequency: --	20	0.8827	
	-- 21	0.1173	
	min	max	average
Occupancy,	20	21	20.117
Weight,	2000.0	2080.0	0.32179
Rejected,		443656	2017.8
Fraction rejected, frRe,		44.366 %	21.883
SUMMARY, fractions:			(all, 1000000)
	frTr	frWa	frRe
	0.77 %	0.89 %	44.37 %

2014-07-06 UTC+0060 1:58:11.237


2014-07-06 UTC+0060 1:58:22.929

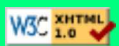
CPU: 11.7 sec.

End



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 Packet filling, as tubes		Execute
Fills (via Monte Carlo) packets, as tubes, with items. SPE Nazaré/pt		2014.Jul.06 01:53:43
L, U	2000 2080 g (specification limits)	Lower, upper specs on packet weight (ΣX). •
μ, σ	100 3 g	Mean and st. dev. for the weight of each item, X .
X_a, X_b	95 105 g ($0 < X_a < x < X_b$)	Truncation X_a (min) and X_b (max) for item. •
Strategy	<input checked="" type="radio"/> none <input type="radio"/> FIFO	Strategy: none or 'FIFO rectify'. •
$N, .seed$	1×10 ⁶ 0	No. of items ("lot size"), random no. gener. seed. •
tol, klass, y_{\max}	1.6 200 0 g ⁻¹ ['0' (≠ '0'), auto.]	Tolerance, no. of histo. classes, max. y for graph. •
Show values	No	Shows the coordinates of the graph. •
<p>Simulates, via Monte Carlo, the filling of a packet ("bag") of items, in a tube-style, FIFO (first in, first out) strategy (as in a doubly open tube). The objective is a final filling with weight (mass) in (L, U). An example might be to fill a bag of 2 kg of oranges, namely (as in the base data), weighing between $L = 2000$ and $U = 2080$ g.</p> <p>The weight of each item is considered <i>truncated Gaussian</i>. (Tolerance is for the inversion of the Gaussian distribution.)</p> <p>Terminology for <i>fractions</i> (costs incurred): 'frTr', fr. truncated from the original product; 'frWa' (waste), fr. wasted as giveaway (weight above L); 'frRe' (rejected), fr. of unused items, possibly recyclable.</p> <p>Several other, better strategies (worthy of research) would be convenient to try to reach the final sum within the limits.</p>		
<input type="button" value="Reset"/>	<i>References:</i>	Plate: TubePacketFill3
<ul style="list-style-type: none"> • "Calibrafruta", Leiria (Portugal). • 1900-04-12: YOU DEN, William John (1971-03-31). 		



<http://web.tecnico.ulisboa.pt/~mcasquilho/compute/qc/Fx-3tubefill.php>

Created: 2011-04-12 — Last modified: 2011-10-01

Results

2014-07-06 UTC+0060 2:01:17.493

*** Tube-style packet filling ***

(Apr-2011, MC)

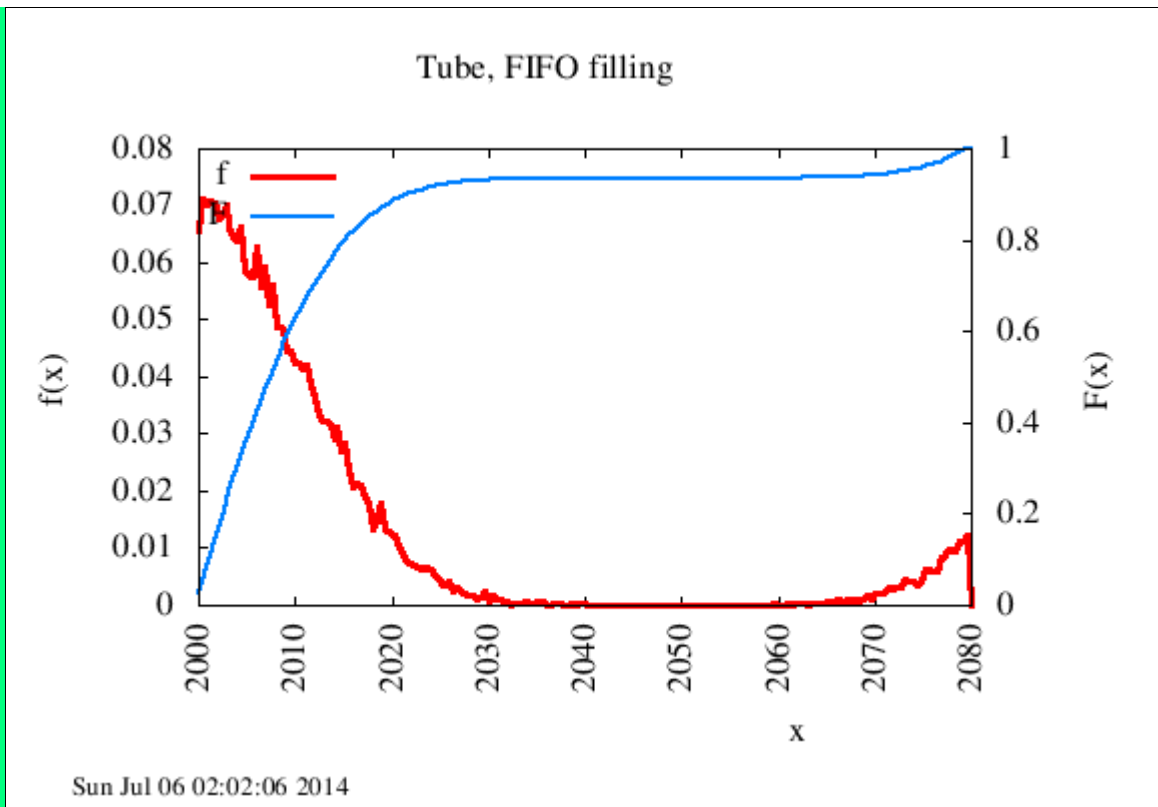
<pre>.L, U, 2000. 2080. .mu, sigma, 100.0 3.000 x_a, x_b (tr.), 95.00 105.0 Rectifying strategy, No. of trials, N, 10^ 6.0 .Seed (repeatability), No. of histogram classes, 200 Show coord.s ? 0</pre>	<pre>specs for packet (total) weight for 'X' truncated Gaussian, X in (x_a, x_b) (0: none) = 1000000 (max int, 10^ 9.33) (0 >=1: no yes) tol, 1.0E-06 (for Gaussian inversion) (0 1: no yes)</pre>
<pre>mid_value, occup., 2040. 20.4 *** THEORETICAL *** truncated Gaussian a', b', -1.667 1.667 .mu_t, sigma_t, 100.00 2.3875 D_mu, rho_sigma, 0.00 0.796 a', b', -1.67 1.67 Phi(a'), Phi(b'), 4.78E-02 0.9522 deltaPhi, 90.442 % Fraction truncated, frTr, 9.558 % Packet occupancy: items min, max, 20 21 L/max, U/min, 95.24 104.0 *** SIMULATED *** No. of data average stdev 1000000 99.998 2.3850 520047 100.32 2.3735 25919 2012.9 17.629 sigma_acc / sigma_all, 0.9952 Occupancy, frequency: -- 20 0.9357 -- 21 0.0643 min max Occupancy, 20 21 Weight, 2000.0 2080.0 Rejected, 479953 Fraction rejected, frRe, 47.995 % SUMMARY, fractions: frTr frWa frRe 9.56 % 0.64 % 48.00 %</pre>	<pre>(occupancy ~= .mid_value / .mu) (_t, truncated) [a' = (x_a - mu) / sigma, b' idem b] for truncated X (mu_t-mu, sigma_t/sigma: from trunc.) a' = (a - mu) / sigma, idem b' (fraction retained) (= 1 - deltaPhi) from 19.05 to 21.89, i.e., [=(L/b)+, (U/a)-] extreme equal X's ('x_a', 'x_b') (moments) all items accepted items packets (accepted vs. all) average stdev 20.064 0.24532 2012.9 17.629 (all, 1000000) (rejected / all)</pre>

2014-07-06 UTC+0060 2:01:17.493

2014-07-06 UTC+0060 2:02:06.842

CPU: 49.3 sec.

End



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