$$\Phi(z) = \int_{-\infty}^{z} \frac{1}{\sqrt{2\pi}} e^{-t^2/2}\,dt:$$

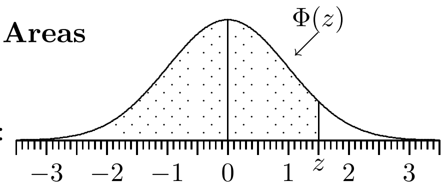

Table 4 CDF for Standard Normal.

z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	.5000	.5040	.5080	.5120	.5160	.5199	.5239	.5279	.5319	.5359
0.1	.5398	.5438	.5478	.5517	.5557	.5596	.5636	.5675	.5714	.5753
0.2	.5793	.5832	.5871	.5910	.5948	.5987	.6026	.6064	.6103	.6141
0.3	.6179	.6217	.6255	.6293	.6331	.6368	.6406	.6443	.6480	.6517
0.4	.6554	.6591	.6628	.6664	.6700	.6736	.6772	.6808	.6844	.6879
0.5	.6915	.6950	.6985	.7019	.7054	.7088	.7123	.7157	.7190	.7224
0.6	.7257	.7291	.7324	.7357	.7389	.7422	.7454	.7486	.7517	.7549
0.7	.7580	.7611	.7642	.7673	.7704	.7734	.7764	.7794	.7823	.7852
0.8	.7881	.7910	.7939	.7967	.7995	.8023	.8051	.8078	.8106	.8133
0.9	.8159	.8186	.8212	.8238	.8264	.8289	.8315	.8340	.8365	.8389
1.0	.8413	.8438	.8461	.8485	.8508	.8531	.8554	.8577	.8599	.8621
1.1	.8643	.8665	.8686	.8708	.8729	.8749	.8770	.8790	.8810	.8830
1.2	.8849	.8869	.8888	.8907	.8925	.8944	.8962	.8980	.8997	.9015
1.3	.9032	.9049	.9066	.9082	.9099	.9115	.9131	.9147	.9162	.9177
1.4	.9192	.9207	.9222	.9236	.9251	.9265	.9279	.9292	.9306	.9319
1.5	.9332	.9345	.9357	.9370	.9382	.9394	.9406	.9418	.9429	.9441
1.6	.9452	.9463	.9474	.9484	.9495	.9505	.9515	.9525	.9535	.9545
1.7	.9554	.9564	.9573	.9582	.9591	.9599	.9608	.9616	.9625	.9633
1.8	.9641	.9649	.9656	.9664	.9671	.9678	.9686	.9693	.9699	.9706
1.9	.9713	.9719	.9726	.9732	.9738	.9744	.9750	.9756	.9761	.9767
2.0	.9772	.9778	.9783	.9788	.9793	.9798	.9803	.9808	.9812	.9817
2.1	.9821	.9826	.9830	.9834	.9838	.9842	.9846	.9850	.9854	.9857
2.2	.9861	.9864	.9868	.9871	.9875	.9878	.9881	.9884	.9887	.9890
2.3	.9893	.9896	.9898	.9901	.9904	.9906	.9909	.9911	.9913	.9916
2.4	.9918	.9920	.9922	.9925	.9927	.9929	.9931	.9932	.9934	.9936
2.5	.9938	.9940	.9941	.9943	.9945	.9946	.9948	.9949	.9951	.9952
2.6	.9953	.9955	.9956	.9957	.9959	.9960	.9961	.9962	.9963	.9964
2.7	.9965	.9966	.9967	.9968	.9969	.9970	.9971	.9972	.9973	.9974
2.8	.9974	.9975	.9976	.9977	.9977	.9978	.9979	.9979	.9980	.9981
2.9	.9981	.9982	.9982	.9983	.9984	.9984	.9985	.9985	.9986	.9986
3.0	.9987	.9987	.9987	.9988	.9988	.9989	.9989	.9989	.9990	.9990
3.1	.9990	.9991	.9991	.9991	.9992	.9992	.9992	.9992	.9993	.9993
3.2	.9993	.9993	.9994	.9994	.9994	.9994	.9994	.9995	.9995	.9995
3.3	.9995	.9995	.9995	.9996	.9996	.9996	.9996	.9996	.9996	.9997
3.4	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9998

$\Phi(0.6745) = 0.75$ $\Phi(1.6449) = 0.95$ $\Phi(2.3263) = 0.99$ $\Phi(3.0902) = 0.999$
$\Phi(1.2816) = 0.90$ $\Phi(1.9600) = 0.975$ $\Phi(2.5758) = 0.995$ $\Phi(3.2905) = 0.9995$

Distributions

Binomial	$\Pr[X=x]$	$=$	$\binom{n}{x} p^x q^{(n-x)},\ x=0,1,\ldots,n$	$\mu=np,\ \sigma^2=npq$
Poisson	$\Pr[X=k]$	$=$	$\lambda^k\, e^{-\lambda}/k!,\ k=0,1,\ldots$	$\mu=\lambda,\ \sigma^2=\lambda$
Geometric	$\Pr[X=x]$	$=$	$pq^x,\ x=0,1,2,\ldots$	$\mu=q/p,\ \sigma^2=q/p^2$
Exponential	$\Pr[X\le x]$	$=$	$1-e^{-\lambda x},\ x\in(0,\infty)$	$\mu=1/\lambda,\ \sigma^2=1/\lambda^2$
	$f(x)$	$=$	$\lambda e^{-\lambda x},\ x>0;\ 0,\ x\le 0$	
Uniform	$\Pr[X\le x]$	$=$	$(x-a)/(b-a),\ x\in(a,b)$	$\mu=\frac{a+b}{2},\ \sigma^2=\frac{(b-a)^2}{12}$
	$f(x)$	$=$	$\frac{1}{b-a},\ a<x<b;\ 0,\ x\notin(a,b)$	
Normal	$\Pr[X\le x]$	$=$	$\Phi(\frac{x-\mu}{\sigma}),\ x\in\mathbb{R}$	$\mu=\mu,\ \sigma^2=\sigma^2$
	$f(x)$	$=$	$\frac{1}{\sqrt{2\pi}\sigma}e^{-(x-\mu)^2/2\sigma^2},\ x\in\mathbb{R}$	

$$P_k^n = \frac{n!}{(n-k)!} = \overbrace{(n)(n-1)\cdots(n-k+1)}^{k\text{ terms}}$$

$$\text{"}n\text{ choose }k\text{":}\ \binom{n}{k} = \frac{n!}{k!(n-k)!} = \frac{(n)(n-1)\cdots(n-k+1)}{(k)(k-1)\cdots(1)}$$

$$(a+b)^n = \textstyle\sum_{k=0}^n \binom{n}{k} a^k b^{n-k}$$

$$\textstyle\sum_{k=0}^\infty ar^k = a/(1-r) \qquad \sum_{k=0}^n ar^k = (a-ar^{n+1})/(1-r)$$

$$\Pr[X\le x] = F(x) = \textstyle\int_{-\infty}^x f(t)\,dt \qquad f(x) = F'(x)$$

$$\mathsf{E}[g(X)] = \textstyle\int g(x)f(x)\,dx \qquad \mathsf{E}[g(X)] = \sum_x g(x)P(x)$$

$$\mu = \mathsf{E}[X] = \textstyle\int_{-\infty}^\infty xf(x)\,dx \qquad \sigma^2 = \mathsf{E}[(X-\mu)^2] = \mathsf{E}[X^2]-\mu^2$$

A **and** B : $A\cap B$ **not** A : A^c A **or** B : $A\cup B$

$$\mathsf{P}[A|B] = \mathsf{P}[A\cap B]/\mathsf{P}[B] \qquad \mathsf{P}[B|A] = \mathsf{P}[A\cap B]/\mathsf{P}[A]$$

$$\mathsf{P}[A\cap B] = \mathsf{P}[A|B]\,\mathsf{P}[B] \qquad \mathsf{P}[A\cup B] = \mathsf{P}[A]+\mathsf{P}[B]-\mathsf{P}[A\cap B]$$

Independent $\Leftrightarrow \mathsf{P}[A\cap B] = \mathsf{P}[A]\,\mathsf{P}[B]$; Exclusive $\Leftrightarrow \mathsf{P}[A\cap B] = 0$

Bayes: $\mathsf{P}[A_i|B] = \frac{\mathsf{P}[B|A_i]\mathsf{P}[A_i]}{\mathsf{P}[B|A_1]\mathsf{P}[A_1]+\ldots+\mathsf{P}[B|A_k]\mathsf{P}[A_k]}$ $A_i\cap A_j = \emptyset,\quad \mathsf{P}[A_1]+\ldots+\mathsf{P}[A_k]=1$