Appendix C: Table for Cumulative Standard Normal Distribution

The following table gives values for the cumulative standard normal distribution function. The probability density function for the standard normal random variable, z, is:

$$\phi(z) = \frac{1}{\sqrt{2\pi}} e^{z^2/2} dx, -\infty < z < \infty.$$

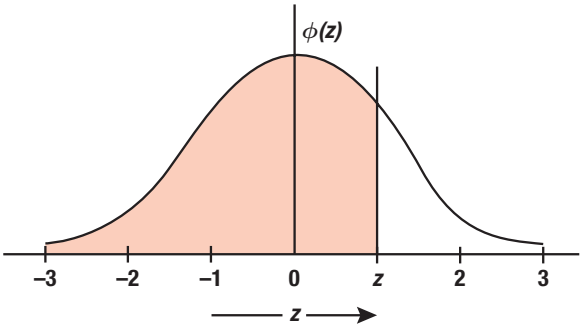
The cumulative distribution function is given by:

$$\Phi(z) = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{z} e^{x^2/2} dx, -\infty < z < \infty.$$

The table has values for $\Phi(z)$ for nonnegative values for z (for the range $0 \leq z \leq 4.99$). The values for negative values for z can be found by using the following equation because standard normal distribution is symmetrical:

$$\Phi(-z) = 1 - \Phi(z), 0 \leq z \leq \infty.$$

We read values such as $\Phi(3.39) = 0.9^{3}6505 = 0.9996505$:



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$$\Phi(z) = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{z} e^{-x^2/2} dx.$$

z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.5000	0.5040	0.5080	0.5120	0.5160	0.5199	0.5239	0.5279	0.5319	0.5359
0.1	0.5398	0.5438	0.5478	0.5517	0.5557	0.5596	0.5636	0.5675	0.5714	0.5753
0.2	0.5793	0.5832	0.5871	0.5910	0.5948	0.5987	0.6026	0.6064	0.6103	0.6141
0.3	0.6179	0.6217	0.6255	0.6293	0.6331	0.6368	0.6406	0.6443	0.6480	0.6517
0.4	0.6554	0.6591	0.6628	0.6664	0.6700	0.6736	0.6772	0.6808	0.6844	0.6879
0.5	0.6915	0.6950	0.6985	0.7019	0.7054	0.7088	0.7123	0.7157	0.7190	0.7224
0.6	0.7257	0.7291	0.7324	0.7357	0.7389	0.7422	0.7454	0.7486	0.7517	0.7549
0.7	0.7580	0.7611	0.7642	0.7673	0.7703	0.7734	0.7764	0.7794	0.7823	0.7852
0.8	0.7881	0.7910	0.7939	0.7967	0.7995	0.8023	0.8051	0.8078	0.8106	0.8133
0.9	0.8159	0.8186	0.8212	0.8238	0.8264	0.8289	0.8315	0.8340	0.8365	0.8389
1.0	0.8413	0.8438	0.8461	0.8485	0.8508	0.8531	0.8554	0.8577	0.8599	0.8621
1.1	0.8643	0.8665	0.8686	0.8708	0.8729	0.8749	0.8770	0.8790	0.8810	0.8830
1.2	0.8849	0.8869	0.8888	0.8907	0.8925	0.8944	0.8962	0.8980	0.8997	0.90147
1.3	0.90320	0.90490	0.90658	0.90824	0.90988	0.91149	0.91309	0.91466	0.91621	0.91774
1.4	0.91924	0.92073	0.92220	0.92364	0.92507	0.92647	0.92785	0.92922	0.93056	0.93189
1.5	0.93319	0.93448	0.93574	0.93699	0.93822	0.93943	0.94062	0.94179	0.94295	0.94408
1.6	0.94520	0.94630	0.94738	0.94845	0.94950	0.95053	0.95154	0.95254	0.95352	0.95449
1.7	0.95543	0.95637	0.95728	0.95818	0.95907	0.95994	0.96080	0.96164	0.96246	0.96327
1.8	0.96407	0.96485	0.96562	0.96638	0.96712	0.96784	0.96856	0.96926	0.96995	0.97062
1.9	0.97128	0.97193	0.97257	0.97320	0.97381	0.97441	0.97500	0.97558	0.97615	0.97670
2.0	0.97725	0.97778	0.97831	0.97882	0.97932	0.97982	0.98030	0.98077	0.98124	0.98169
2.1	0.98214	0.98257	0.98300	0.98341	0.98382	0.98422	0.98461	0.98500	0.98537	0.98574
2.2	0.98610	0.98645	0.98679	0.98713	0.98745	0.98778	0.98809	0.98840	0.98870	0.98899
2.3	0.98928	0.98956	0.98983	0.9^20097	0.9^20358	0.9^20613	0.9^20863	0.9^21106	0.9^21344	0.9^21576
2.4	0.9^21802	0.9^22024	0.9^22240	0.9^22451	0.9^22656	0.9^22857	0.9^23053	0.9^23244	0.9^23431	0.9^23613
2.5	0.9^23790	0.9^23963	0.9^34132	0.9^24297	0.9^24457	0.9^24614	0.9^24766	0.9^24915	0.9^25060	0.9^25201
2.6	0.9^25339	0.9^25473	0.9^25604	0.9^25731	0.9^25855	0.9^25975	0.9^26093	0.9^26207	0.9^26319	0.9^26427
2.7	0.9^26533	0.9^26636	0.9^26736	0.9^26833	0.9^26928	0.9^27020	0.9^27110	0.9^27197	0.9^27282	0.9^27365
2.8	0.9^27445	0.9^27523	0.9^27599	0.9^27673	0.9^27744	0.9^27814	0.9^27882	0.9^27948	0.9^28012	0.9^28074
2.9	0.9^28134	0.9^28193	0.9^28250	0.9^28305	0.9^28359	0.9^28411	0.9^28462	0.9^28511	0.9^28559	0.9^28605
3.0	0.9^28650	0.9^28694	0.9^28736	0.9^28777	0.9^28817	0.9^28856	0.9^28893	0.9^28930	0.9^28965	0.9^28999
3.1	0.9^30324	0.9^30646	0.9^30957	0.9^31260	0.9^31553	0.9^31836	0.9^32112	0.9^32378	0.9^32636	0.9^32886
3.2	0.9^33129	0.9^33363	0.9^33590	0.9^33810	0.9^34024	0.9^34230	0.9^34429	0.9^34623	0.9^34810	0.9^34991
3.3	0.9^35166	0.9^35335	0.9^35499	0.9^35658	0.9^35811	0.9^35959	0.9^36103	0.9^36242	0.9^36376	0.9^36505
3.4	0.9^36631	0.9^36752	0.9^36869	0.9^36982	0.9^37091	0.9^37197	0.9^37299	0.9^37398	0.9^37493	0.9^37585
3.5	0.9^37674	0.9^37759	0.9^37842	0.9^37922	0.9^37999	0.9^38074	0.9^38146	0.9^38215	0.9^38282	0.9^38347
3.6	0.9^38409	0.9^38469	0.9^38527	0.9^38583	0.9^38637	0.9^38689	0.9^38739	0.9^38787	0.9^38834	0.9^38879
3.7	0.9^38922	0.9^38964	0.9^40039	0.9^40426	0.9^40799	0.9^41158	0.9^41504	0.9^41838	0.9^42159	0.9^42568
3.8	0.9^42765	0.9^43052	0.9^43327	0.9^43593	0.9^43848	0.9^44094	0.9^44331	0.9^44558	0.9^44777	0.9^44988
3.9	0.9^45190	0.9^45385	0.9^45573	0.9^45753	0.9^45926	0.9^46092	0.9^46253	0.9^46406	0.9^46554	0.9^46696
4.0	0.9^46833	0.9^46964	0.9^47090	0.9^47211	0.9^47327	0.9^47439	0.9^47546	0.9^47649	0.9^47748	0.9^47843
4.1	0.9^47934	0.9^48022	0.9^48106	0.9^48186	0.9^48263	0.9^48338	0.9^48409	0.9^48477	0.9^48542	0.9^48605
4.2	0.9^48665	0.9^48723	0.9^48778	0.9^48832	0.9^48882	0.9^48931	0.9^48978	0.9^50226	0.9^50655	0.9^51066
4.3	0.9^51460	0.9^51837	0.9^52199	0.9^52545	0.9^52876	0.9^53193	0.9^53497	0.9^53788	0.9^54066	0.9^54332
4.4	0.9^54587	0.9^54831	0.9^55065	0.9^55288	0.9^55502	0.9^55706	0.9^55902	0.9^56089	0.9^56268	0.9^56439
4.5	0.9^56602	0.9^56759	0.9^56908	0.9^57051	0.9^57187	0.9^57318	0.9^57442	0.9^57561	0.9^57675	0.9^57784
4.6	0.9^57888	0.9^57987	0.9^58081	0.9^58172	0.9^58258	0.9^58340	0.9^58419	0.9^58494	0.9^58566	0.9^58634
4.7	0.9^58699	0.9^58761	0.9^58821	0.9^58877	0.9^58931	0.9^58983	0.9^60320	0.9^60789	0.9^61235	0.9^61661
4.8	0.9^62067	0.9^62453	0.9^62822	0.9^63173	0.9^63508	0.9^63827	0.9^64131	0.9^64420	0.9^64696	0.9^64958
4.9	0.9^65208	0.9^65446	0.9^65673	0.9^65889	0.9^66094	0.9^66289	0.9^66475	0.9^66652	0.9^66821	0.9^66981

Example: $\Phi(3.39) = 0.9996505$, $\Phi(0.98) = 0.8365$.