1 Beskrivende statistikk

Vi lar $x_1, x_2, \ldots, x_n$ betegne n observasjoner.
Gjennomsnitt

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

Empirisk varians

$$s^2 = \frac{1}{n-1}\sum_{i=1}^{n}(x_i - \bar{x})^2$$

Empirisk standardavvik

$$s = \sqrt{s^2}$$

2 Hendelser og sannsynlighet

Addisjonsregelen

$$P(A \cup B) = P(A) + P(B) - P(A \cap B)$$

Betinget sannsynlighet

$$P(A|B) = \frac{P(A \cap B)}{P(B)}$$

Total sannsynlighet La hendelsene A_1, A_2, ..., A_n danne en partisjon av utfallsrommet. Da er

$$P(B) = \sum_{i=1}^{n} P(B|A_i)P(A_i)$$

Bayes regel

$$P(A|B) = \frac{P(B|A)P(A)}{P(B)}$$

Uavhengige hendelser

$$P(A \cap B) = P(A) \cdot P(B)$$
$$P(A|B) = P(A),\ P(B|A) = P(B)$$

2.1 Urnemodeller

En urne inneholder n kuler. Antall mulige trekninger av r kuler er:

1. Ordnet utvalg, trekning med tilbakelegging

$$n^r$$

2. Ordnet utvalg, trekning uten tilbakelegging

$${}_nP_r = \frac{n!}{(n-r)!}$$

3. Ikke-ordnet utvalg, trekning uten tilbakelegging

$${}_nC_r = \binom{n}{r} = \frac{n!}{r!(n-r)!}$$

3 Stokastiske variabler

3.1 Diskret

Kumulativ fordeling

$$F(x) = P(X \leq x) = \sum_{t \leq x} P(X = t)$$

Forventningsverdi

$$\mathrm{E}(X) = \mu_x = \sum_x x \cdot P(X = x)$$

Varians

$$\mathrm{Var}(X) = \sigma_x^2 = \mathrm{E}((X - \mu_x)^2) = \sum_x (x - \mu_x)^2 \cdot P(X = x)$$

Standardavvik

$$\mathrm{SD}(X) = \sigma_x = \sqrt{\mathrm{Var}(X)}$$

3.2 Kontinuerlig

Kumulativ fordeling

$$F(x) = P(X \leq x) = \int_{-\infty}^{x} f(t)\,dt$$

Forventningsverdi

$$\mathrm{E}(X) = \mu_x = \int_{-\infty}^{\infty} x \cdot f(x)\,dx$$

Varians

$$\mathrm{Var}(X) = \sigma_x^2 = \mathrm{E}((X - \mu_x)^2) = \int_{-\infty}^{\infty} (x - \mu_x)^2 \cdot f(x)\,dx$$

Standardavvik

$$\mathrm{SD}(X) = \sigma_x = \sqrt{\mathrm{Var}(X)}$$

3.3 Kovarians og korrelasjon

$$\mathrm{Cov}(X, Y) = \mathrm{E}\left((X - \mu_x) \cdot (Y - \mu_y)\right) = \mathrm{E}(XY) - \mu_x\mu_y$$

Korrelasjonskoeffisient: $\rho = \dfrac{\mathrm{Cov}(X, Y)}{\sigma_x \cdot \sigma_y}$

$\mathrm{Cov}(X, Y) = 0$ dersom X og Y er uavhengige.

3.4 Regneregler

$$P(a < X \leq b) = F(b) - F(a)$$

$$\mathrm{E}(aX + b) = a\mathrm{E}(X) + b$$
$$\mathrm{Var}(aX + b) = a^2\mathrm{Var}(X)$$

$$\mathrm{E}(aX + bY) = a\mathrm{E}(X) + b\mathrm{E}(Y)$$
$$\mathrm{Var}(aX + bY) = a^2\mathrm{Var}(X) + b^2\mathrm{Var}(Y) + 2ab\mathrm{Cov}(X, Y)$$

4 Sannsynlighetsfordelinger

Binomisk fordeling

$$X \sim \text{Binom}(n,\, p)$$
$$P(X = x) = \binom{n}{x} p^x (1-p)^{n-x},$$
$$\text{for } x = 0, 1, 2, \ldots, n$$
$$\text{E}(X) = np, \quad \text{Var}(X) = np(1-p)$$

Geometrisk fordeling

$$X \sim \text{Geom}(p)$$
$$P(X = x) = p(1-p)^{x-1},$$
$$\text{for } x = 1, 2, \ldots$$
$$F(x) = P(X \leq x) = 1 - (1-p)^x$$
$$\text{E}(X) = \frac{1}{p}, \quad \text{Var}(X) = \frac{1-p}{p^2}$$

Poissonfordeling

$$X \sim \text{Poisson}(\lambda t)$$
$$P(X = x) = \frac{(\lambda t)^x}{x!} e^{-\lambda t},$$
$$\text{for } x = 0, 1, 2, \ldots$$
$$\text{E}(X) = \lambda t, \quad \text{Var}(X) = \lambda t$$

Eksponentialfordeling

$$T \sim \text{Eksponential}(\lambda)$$
$$f(t) = \lambda e^{-\lambda t}, \quad \text{for } t > 0$$
$$F(t) = P(T \leq t) = 1 - e^{-\lambda t}$$
$$\text{E}(T) = \frac{1}{\lambda}, \quad \text{Var}(T) = \frac{1}{\lambda^2}$$

Standard normalfordeling

$$Z \sim \text{N}(0, 1)$$
$$f(z) = \phi(z) = \frac{1}{\sqrt{2\pi}} e^{-\frac{z^2}{2}}, \quad \text{for } -\infty < z < \infty$$
$$F(z) = P(Z \leq z) = \Phi(z)$$
$$\text{E}(X) = 0, \quad \text{Var}(X) = 1$$

Normalfordeling

$$X \sim \text{N}(\mu, \sigma)$$
$$f(x) = \frac{1}{\sqrt{2\pi}} \frac{1}{\sigma} e^{-\frac{(x-\mu)^2}{2\sigma^2}}, \quad \text{for } -\infty < x < \infty$$
$$F(x) = P(X \leq x) = \Phi\left(\frac{x-\mu}{\sigma}\right)$$
$$\text{E}(X) = \mu, \quad \text{Var}(X) = \sigma^2$$

4.1 Regneregler normalfordeling

Vi ser på n uavhengige stokastiske variabler $X_1, X_2, \ldots, X_n$ slik at $X_i \sim N(\mu, \sigma)$, for $i = 1, \ldots, n$. Da er

$$\bar{X} = \frac{X_1 + X_2 + \cdots + X_n}{n} \sim \text{N}\left(\mu, \frac{\sigma}{\sqrt{n}}\right)$$

og

$$X_1 + X_2 + \cdots + X_n \sim \text{N}\left(n\mu, \sqrt{n} \cdot \sigma\right)$$

4.1.1 Normaltilnærminger

$\text{Binom}(n,\, p) \approx \text{N}(np, \sqrt{np(1-p)})$ hvis $np(1-p) \geq 5$,
$\text{Poisson}(\lambda t) \approx \text{N}(\lambda t, \sqrt{\lambda t})$ hvis $\lambda t > 10$

4.1.2 Sentralgrenseteoremet

Dersom $X_1, X_2, \ldots, X_n$ er uavhengige stokastiske variabler med forventning $\text{E}(X_i) = \mu$ og varians $\text{Var}(X_i) = \sigma^2$, for $i = 1, \ldots, n$, og dersom $n > 30$, så er

$$\bar{X} = \frac{X_1 + X_2 + \cdots + X_n}{n} \text{ tilnærmet } \text{N}\left(\mu, \frac{\sigma}{\sqrt{n}}\right)$$

og

$$X_1 + X_2 + \cdots + X_n \text{ tilnærmet } \text{N}\left(n\mu, \sqrt{n} \cdot \sigma\right)$$

5 Punktestimering

5.1 Forventningsverdi og varians

For et tilfeldig utvalg $X_1, X_2, \ldots, X_n$ der $\text{E}(X_i) = \mu$ og $\text{Var}(X_i) = \sigma^2$, for $i = 1, \ldots, n$, så er

Estimator for forventningsverdien (μ):

$$\hat{\mu} = \bar{X} = \frac{1}{n} \sum_{i=1}^{n} X_i$$

Estimator for varians (σ^2):

$$S^2 = \frac{1}{n-1} \sum_{i=1}^{n} (X_i - \bar{X})^2$$

Estimator for standardavviket (σ):

$$S = \sqrt{S^2}$$

5.2 Sannsynligheten p i binomisk fordeling

Dersom X teller antall suksesser i en binomisk forsøksrekke av n forsøk så er estimator for sannsynligheten for suksess (p):

$$\hat{p} = \frac{X}{n}$$

5.3 Raten λ i poissonfordelingen

Dersom X teller antall hendelser i en poissonprosess med rate λ over et intervall/område av lengde/størrelse t, så er estimator for raten (λ):

$$\hat{\lambda} = \frac{X}{t}$$

6 Konfidensintervall

6.1 Forventningsverdi μ

For et tilfeldig utvalg $X_1, X_2, \ldots, X_n$, $X_i \sim N(\mu, \sigma)$, $i = 1, \ldots, n$, der standardavviket σ er *kjent*, så er

$$\left[\bar{X} - z_{\alpha/2} \cdot \frac{\sigma}{\sqrt{n}},\ \bar{X} + z_{\alpha/2} \cdot \frac{\sigma}{\sqrt{n}}\right]$$

et $100(1-\alpha)\%$ konfidensintervall for μ.

Dersom standardavviket σ er *ukjent*, så er

$$\left[\bar{X} - t_{\alpha/2,n-1} \cdot \frac{S}{\sqrt{n}},\ \bar{X} + t_{\alpha/2,n-1} \cdot \frac{S}{\sqrt{n}}\right]$$

et $100(1-\alpha)\%$ konfidensintervall for μ.

6.2 Sannsynligheten p i binomisk fordeling

Under forutsetningen om at $n\hat{p}(1-\hat{p}) \geq 5$, så er

$$\left[\hat{p} - z_{\alpha/2} \cdot \sqrt{\frac{\hat{p}(1-\hat{p})}{n}},\ \hat{p} + z_{\alpha/2} \cdot \sqrt{\frac{\hat{p}(1-\hat{p})}{n}}\right]$$

et tilnærmet $100(1-\alpha)\%$ konfidensintervall for p.

6.3 Raten λ i poissonfordelingen

Under forutsetningen om at $\hat{\lambda}t > 10$, så er

$$\left[\hat{\lambda} - z_{\alpha/2} \cdot \sqrt{\frac{\hat{\lambda}}{t}},\ \hat{\lambda} + z_{\alpha/2} \cdot \sqrt{\frac{\hat{\lambda}}{t}}\right]$$

et tilnærmet $100(1-\alpha)\%$ konfidensintervall for λ.

7 Hypotesetesting

7.1 Forventningsverdi μ

Testobservator for $H_0 : \mu = \mu_0$ mot

1. $H_1 : \mu \neq \mu_0$, eller
2. $H_1 : \mu > \mu_0$, eller
3. $H_1 : \mu < \mu_0$,

dersom standardavviket σ er *kjent* (Z-test):

$$Z = \frac{\bar{X} - \mu_0}{\sigma/\sqrt{n}} \overset{H_0}{\sim} N(0,1)$$

og dersom standardavviket er *ukjent* (T-test):

$$T = \frac{\bar{X} - \mu_0}{S/\sqrt{n}} \overset{H_0}{\sim} t_{n-1}$$

7.2 Sannsynligheten p i binomisk fordeling

Testobservator for $H_0 : p = p_0$ (Z-test):

$$Z = \frac{\hat{p} - p_0}{\sqrt{\frac{p_0(1-p_0)}{n}}} \overset{H_0}{\approx} N(0,1)$$

8 Kovarians og korrelasjon

Estimator for **kovarians** $\mathrm{Cov}(X,Y)$ og **korrelasjon**:

$$\widehat{\mathrm{Cov}}(X,Y) = \frac{1}{n-1}\sum_{i=1}^{n}(X_i - \bar{X})(Y_i - \bar{Y}),$$

$$R = \frac{\widehat{\mathrm{Cov}}(X,Y)}{S_x \cdot S_y}, \text{ der } S_x \text{ og } S_y$$

er estimatorer for standardavvikene til X og Y.

9 Enkel lineær regresjon

La $(x_1, Y_1), (x_2, Y_2), \ldots, (x_n, Y_n)$ være n uavhengige par der x-ene er kjente tall, og Y-ene er stokastiske variabler slik at

$$Y_i | X_i = x_i \sim \mathrm{N}(\beta_0 + \beta_1 x_i,\ \sigma) \text{ for } i = 1, \ldots, n$$

En annen måte å formulere modellen på er:

$$Y_i = \beta_0 + \beta_1 x_i + e_i, \quad e_i \sim \mathrm{N}(0, \sigma), \text{ for } i = 1, \ldots, n$$

Minste kvadratsums estimatorer for β_0 og β_1:

$$\hat{\beta}_1 = \frac{\sum_{i=1}^{n}(x_i - \bar{x})(Y_i - \bar{Y})}{\sum_{i=1}^{n}(x_i - \bar{x})^2}, \quad \text{og} \quad \hat{\beta}_0 = \bar{Y} - \hat{\beta}_1 \bar{x}.$$

Estimert regresjonslinje:

$$\hat{Y}_i = \hat{\beta}_0 + \hat{\beta}_1 x_i$$

Estimator for varians σ^2 er:

$$S^2 = \frac{1}{n-2}\sum_{i=1}^{n}(Y_i - \hat{Y}_i)^2 = \frac{1}{n-2}\sum_{i=1}^{n}(Y_i - \hat{\beta}_0 - \hat{\beta}_1 x_i)^2$$

og estimator for standardavviket σ, er $S = \sqrt{S^2}$.

Godhetsmål for regresjonsmodellen:

$$R^2 = \frac{\mathrm{SST} - \mathrm{SSE}}{\mathrm{SST}}, \text{ der SST} = \sum_{i=1}^{n}(Y_i - \bar{Y})^2 \text{ og,}$$

$$\mathrm{SSE} = \sum_{i=1}^{n}(Y_i - \hat{Y}_i)^2 = \sum_{i=1}^{n}(Y_i - \hat{\beta}_0 - \hat{\beta}_1 x_i)^2$$

Konfidensintervall for β_1:

$$\left[\hat{\beta}_1 - t_{\alpha/2,\,n-2} \cdot \mathrm{SE}(\hat{\beta}_1),\ \hat{\beta}_1 + t_{\alpha/2,\,n-2} \cdot \mathrm{SE}(\hat{\beta}_1)\right], \text{ der}$$

$$\mathrm{SE}(\hat{\beta}_1) = \frac{S}{\sqrt{\sum_{i=1}^{n}(x_i - \bar{x})^2}}$$

Testobservator for $H_0 : \beta_1 = 0$ mot $H_0 : \beta_1 \neq 0$:

$$T = \frac{\hat{\beta}_1 - 0}{\mathrm{SE}(\hat{\beta}_1)} \overset{H_0}{\sim} t_{n-2}$$

BINOMISK FORDELING: $P(X \leq x)$

		p											
n	x	0.05	0.1	0.15	0.2	0.25	0.3	0.4	0.5	0.6	0.7	0.8	0.9
2	0	0.902	0.810	0.723	0.640	0.563	0.490	0.360	0.250	0.160	0.090	0.040	0.010
	1	0.998	0.990	0.978	0.960	0.938	0.910	0.840	0.750	0.640	0.510	0.360	0.190
3	0	0.857	0.729	0.614	0.512	0.422	0.343	0.216	0.125	0.064	0.027	0.008	0.001
	1	0.993	0.972	0.939	0.896	0.844	0.784	0.648	0.500	0.352	0.216	0.104	0.028
	2	1.000	0.999	0.997	0.992	0.984	0.973	0.936	0.875	0.784	0.657	0.488	0.271
4	0	0.815	0.656	0.522	0.410	0.316	0.240	0.130	0.062	0.026	0.008	0.002	0.000
	1	0.986	0.948	0.890	0.819	0.738	0.652	0.475	0.313	0.179	0.084	0.027	0.004
	2	1.000	0.996	0.988	0.973	0.949	0.916	0.821	0.688	0.525	0.348	0.181	0.052
	3	1.000	1.000	0.999	0.998	0.996	0.992	0.974	0.938	0.870	0.760	0.590	0.344
5	0	0.774	0.590	0.444	0.328	0.237	0.168	0.078	0.031	0.010	0.002	0.000	0.000
	1	0.977	0.919	0.835	0.737	0.633	0.528	0.337	0.187	0.087	0.031	0.007	0.000
	2	0.999	0.991	0.973	0.942	0.896	0.837	0.683	0.500	0.317	0.163	0.058	0.009
	3	1.000	1.000	0.998	0.993	0.984	0.969	0.913	0.812	0.663	0.472	0.263	0.081
	4	1.000	1.000	1.000	1.000	0.999	0.998	0.990	0.969	0.922	0.832	0.672	0.410
6	0	0.735	0.531	0.377	0.262	0.178	0.118	0.047	0.016	0.004	0.001	0.000	0.000
	1	0.967	0.886	0.776	0.655	0.534	0.420	0.233	0.109	0.041	0.011	0.002	0.000
	2	0.998	0.984	0.953	0.901	0.831	0.744	0.544	0.344	0.179	0.070	0.017	0.001
	3	1.000	0.999	0.994	0.983	0.962	0.930	0.821	0.656	0.456	0.256	0.099	0.016
	4	1.000	1.000	1.000	0.998	0.995	0.989	0.959	0.891	0.767	0.580	0.345	0.114
	5	1.000	1.000	1.000	1.000	1.000	0.999	0.996	0.984	0.953	0.882	0.738	0.469
7	0	0.698	0.478	0.321	0.210	0.133	0.082	0.028	0.008	0.002	0.000	0.000	0.000
	1	0.956	0.850	0.717	0.577	0.445	0.329	0.159	0.063	0.019	0.004	0.000	0.000
	2	0.996	0.974	0.926	0.852	0.756	0.647	0.420	0.227	0.096	0.029	0.005	0.000
	3	1.000	0.997	0.988	0.967	0.929	0.874	0.710	0.500	0.290	0.126	0.033	0.003
	4	1.000	1.000	0.999	0.995	0.987	0.971	0.904	0.773	0.580	0.353	0.148	0.026
	5	1.000	1.000	1.000	1.000	0.999	0.996	0.981	0.938	0.841	0.671	0.423	0.150
	6	1.000	1.000	1.000	1.000	1.000	1.000	0.998	0.992	0.972	0.918	0.790	0.522
8	0	0.663	0.430	0.272	0.168	0.100	0.058	0.017	0.004	0.001	0.000	0.000	0.000
	1	0.943	0.813	0.657	0.503	0.367	0.255	0.106	0.035	0.009	0.001	0.000	0.000
	2	0.994	0.962	0.895	0.797	0.679	0.552	0.315	0.145	0.050	0.011	0.001	0.000
	3	1.000	0.995	0.979	0.944	0.886	0.806	0.594	0.363	0.174	0.058	0.010	0.000
	4	1.000	1.000	0.997	0.990	0.973	0.942	0.826	0.637	0.406	0.194	0.056	0.005
	5	1.000	1.000	1.000	0.999	0.996	0.989	0.950	0.855	0.685	0.448	0.203	0.038
	6	1.000	1.000	1.000	1.000	1.000	0.999	0.991	0.965	0.894	0.745	0.497	0.187
	7	1.000	1.000	1.000	1.000	1.000	1.000	0.999	0.996	0.983	0.942	0.832	0.570

BINOMISK FORDELING: $P(X \leq x)$

		p											
n	x	0.05	0.1	0.15	0.2	0.25	0.3	0.4	0.5	0.6	0.7	0.8	0.9
9	0	0.630	0.387	0.232	0.134	0.075	0.040	0.010	0.002	0.000	0.000	0.000	0.000
	1	0.929	0.775	0.599	0.436	0.300	0.196	0.071	0.020	0.004	0.000	0.000	0.000
	2	0.992	0.947	0.859	0.738	0.601	0.463	0.232	0.090	0.025	0.004	0.000	0.000
	3	0.999	0.992	0.966	0.914	0.834	0.730	0.483	0.254	0.099	0.025	0.003	0.000
	4	1.000	0.999	0.994	0.980	0.951	0.901	0.733	0.500	0.267	0.099	0.020	0.001
	5	1.000	1.000	0.999	0.997	0.990	0.975	0.901	0.746	0.517	0.270	0.086	0.008
	6	1.000	1.000	1.000	1.000	0.999	0.996	0.975	0.910	0.768	0.537	0.262	0.053
	7	1.000	1.000	1.000	1.000	1.000	1.000	0.996	0.980	0.929	0.804	0.564	0.225
	8	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.998	0.990	0.960	0.866	0.613
10	0	0.599	0.349	0.197	0.107	0.056	0.028	0.006	0.001	0.000	0.000	0.000	0.000
	1	0.914	0.736	0.544	0.376	0.244	0.149	0.046	0.011	0.002	0.000	0.000	0.000
	2	0.988	0.930	0.820	0.678	0.526	0.383	0.167	0.055	0.012	0.002	0.000	0.000
	3	0.999	0.987	0.950	0.879	0.776	0.650	0.382	0.172	0.055	0.011	0.001	0.000
	4	1.000	0.998	0.990	0.967	0.922	0.850	0.633	0.377	0.166	0.047	0.006	0.000
	5	1.000	1.000	0.999	0.994	0.980	0.953	0.834	0.623	0.367	0.150	0.033	0.002
	6	1.000	1.000	1.000	0.999	0.996	0.989	0.945	0.828	0.618	0.350	0.121	0.013
	7	1.000	1.000	1.000	1.000	1.000	0.998	0.988	0.945	0.833	0.617	0.322	0.070
	8	1.000	1.000	1.000	1.000	1.000	1.000	0.998	0.989	0.954	0.851	0.624	0.264
	9	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.999	0.994	0.972	0.893	0.651
11	0	0.569	0.314	0.167	0.086	0.042	0.020	0.004	0.000	0.000	0.000	0.000	0.000
	1	0.898	0.697	0.492	0.322	0.197	0.113	0.030	0.006	0.001	0.000	0.000	0.000
	2	0.985	0.910	0.779	0.617	0.455	0.313	0.119	0.033	0.006	0.001	0.000	0.000
	3	0.998	0.981	0.931	0.839	0.713	0.570	0.296	0.113	0.029	0.004	0.000	0.000
	4	1.000	0.997	0.984	0.950	0.885	0.790	0.533	0.274	0.099	0.022	0.002	0.000
	5	1.000	1.000	0.997	0.988	0.966	0.922	0.753	0.500	0.247	0.078	0.012	0.000
	6	1.000	1.000	1.000	0.998	0.992	0.978	0.901	0.726	0.467	0.210	0.050	0.003
	7	1.000	1.000	1.000	1.000	0.999	0.996	0.971	0.887	0.704	0.430	0.161	0.019
	8	1.000	1.000	1.000	1.000	1.000	0.999	0.994	0.967	0.881	0.687	0.383	0.090
	9	1.000	1.000	1.000	1.000	1.000	1.000	0.999	0.994	0.970	0.887	0.678	0.303
	10	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.996	0.980	0.914	0.686
12	0	0.540	0.282	0.142	0.069	0.032	0.014	0.002	0.000	0.000	0.000	0.000	0.000
	1	0.882	0.659	0.443	0.275	0.158	0.085	0.020	0.003	0.000	0.000	0.000	0.000
	2	0.980	0.889	0.736	0.558	0.391	0.253	0.083	0.019	0.003	0.000	0.000	0.000
	3	0.998	0.974	0.908	0.795	0.649	0.493	0.225	0.073	0.015	0.002	0.000	0.000
	4	1.000	0.996	0.976	0.927	0.842	0.724	0.438	0.194	0.057	0.009	0.001	0.000
	5	1.000	0.999	0.995	0.981	0.946	0.882	0.665	0.387	0.158	0.039	0.004	0.000
	6	1.000	1.000	0.999	0.996	0.986	0.961	0.842	0.613	0.335	0.118	0.019	0.001
	7	1.000	1.000	1.000	0.999	0.997	0.991	0.943	0.806	0.562	0.276	0.073	0.004
	8	1.000	1.000	1.000	1.000	1.000	0.998	0.985	0.927	0.775	0.507	0.205	0.026
	9	1.000	1.000	1.000	1.000	1.000	1.000	0.997	0.981	0.917	0.747	0.442	0.111
	10	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.997	0.980	0.915	0.725	0.341
	11	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.998	0.986	0.931	0.718

BINOMISK FORDELING: $P(X \leq x)$

		p											
n	x	0.05	0.1	0.15	0.2	0.25	0.3	0.4	0.5	0.6	0.7	0.8	0.9
13	0	0.513	0.254	0.121	0.055	0.024	0.010	0.001	0.000	0.000	0.000	0.000	0.000
	1	0.865	0.621	0.398	0.234	0.127	0.064	0.013	0.002	0.000	0.000	0.000	0.000
	2	0.975	0.866	0.692	0.502	0.333	0.202	0.058	0.011	0.001	0.000	0.000	0.000
	3	0.997	0.966	0.882	0.747	0.584	0.421	0.169	0.046	0.008	0.001	0.000	0.000
	4	1.000	0.994	0.966	0.901	0.794	0.654	0.353	0.133	0.032	0.004	0.000	0.000
	5	1.000	0.999	0.992	0.970	0.920	0.835	0.574	0.291	0.098	0.018	0.001	0.000
	6	1.000	1.000	0.999	0.993	0.976	0.938	0.771	0.500	0.229	0.062	0.007	0.000
	7	1.000	1.000	1.000	0.999	0.994	0.982	0.902	0.709	0.426	0.165	0.030	0.001
	8	1.000	1.000	1.000	1.000	0.999	0.996	0.968	0.867	0.647	0.346	0.099	0.006
	9	1.000	1.000	1.000	1.000	1.000	0.999	0.992	0.954	0.831	0.579	0.253	0.034
	10	1.000	1.000	1.000	1.000	1.000	1.000	0.999	0.989	0.942	0.798	0.498	0.134
	11	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.998	0.987	0.936	0.766	0.379
	12	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.999	0.990	0.945	0.746
14	0	0.488	0.229	0.103	0.044	0.018	0.007	0.001	0.000	0.000	0.000	0.000	0.000
	1	0.847	0.585	0.357	0.198	0.101	0.047	0.008	0.001	0.000	0.000	0.000	0.000
	2	0.970	0.842	0.648	0.448	0.281	0.161	0.040	0.006	0.001	0.000	0.000	0.000
	3	0.996	0.956	0.853	0.698	0.521	0.355	0.124	0.029	0.004	0.000	0.000	0.000
	4	1.000	0.991	0.953	0.870	0.742	0.584	0.279	0.090	0.018	0.002	0.000	0.000
	5	1.000	0.999	0.988	0.956	0.888	0.781	0.486	0.212	0.058	0.008	0.000	0.000
	6	1.000	1.000	0.998	0.988	0.962	0.907	0.692	0.395	0.150	0.031	0.002	0.000
	7	1.000	1.000	1.000	0.998	0.990	0.969	0.850	0.605	0.308	0.093	0.012	0.000
	8	1.000	1.000	1.000	1.000	0.998	0.992	0.942	0.788	0.514	0.219	0.044	0.001
	9	1.000	1.000	1.000	1.000	1.000	0.998	0.982	0.910	0.721	0.416	0.130	0.009
	10	1.000	1.000	1.000	1.000	1.000	1.000	0.996	0.971	0.876	0.645	0.302	0.044
	11	1.000	1.000	1.000	1.000	1.000	1.000	0.999	0.994	0.960	0.839	0.552	0.158
	12	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.999	0.992	0.953	0.802	0.415
	13	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.999	0.993	0.956	0.771
15	0	0.463	0.206	0.087	0.035	0.013	0.005	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.829	0.549	0.319	0.167	0.080	0.035	0.005	0.000	0.000	0.000	0.000	0.000
	2	0.964	0.816	0.604	0.398	0.236	0.127	0.027	0.004	0.000	0.000	0.000	0.000
	3	0.995	0.944	0.823	0.648	0.461	0.297	0.091	0.018	0.002	0.000	0.000	0.000
	4	0.999	0.987	0.938	0.836	0.686	0.515	0.217	0.059	0.009	0.001	0.000	0.000
	5	1.000	0.998	0.983	0.939	0.852	0.722	0.403	0.151	0.034	0.004	0.000	0.000
	6	1.000	1.000	0.996	0.982	0.943	0.869	0.610	0.304	0.095	0.015	0.001	0.000
	7	1.000	1.000	0.999	0.996	0.983	0.950	0.787	0.500	0.213	0.050	0.004	0.000
	8	1.000	1.000	1.000	0.999	0.996	0.985	0.905	0.696	0.390	0.131	0.018	0.000
	9	1.000	1.000	1.000	1.000	0.999	0.996	0.966	0.849	0.597	0.278	0.061	0.002
	10	1.000	1.000	1.000	1.000	1.000	0.999	0.991	0.941	0.783	0.485	0.164	0.013
	11	1.000	1.000	1.000	1.000	1.000	1.000	0.998	0.982	0.909	0.703	0.352	0.056
	12	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.996	0.973	0.873	0.602	0.184
	13	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.995	0.965	0.833	0.451
	14	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.995	0.965	0.794

BINOMISK FORDELING: $P(X \leq x)$

		p											
n	x	0.05	0.1	0.15	0.2	0.25	0.3	0.4	0.5	0.6	0.7	0.8	0.9
16	0	0.440	0.185	0.074	0.028	0.010	0.003	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.811	0.515	0.284	0.141	0.063	0.026	0.003	0.000	0.000	0.000	0.000	0.000
	2	0.957	0.789	0.561	0.352	0.197	0.099	0.018	0.002	0.000	0.000	0.000	0.000
	3	0.993	0.932	0.790	0.598	0.405	0.246	0.065	0.011	0.001	0.000	0.000	0.000
	4	0.999	0.983	0.921	0.798	0.630	0.450	0.167	0.038	0.005	0.000	0.000	0.000
	5	1.000	0.997	0.976	0.918	0.810	0.660	0.329	0.105	0.019	0.002	0.000	0.000
	6	1.000	0.999	0.994	0.973	0.920	0.825	0.527	0.227	0.058	0.007	0.000	0.000
	7	1.000	1.000	0.999	0.993	0.973	0.926	0.716	0.402	0.142	0.026	0.001	0.000
	8	1.000	1.000	1.000	0.999	0.993	0.974	0.858	0.598	0.284	0.074	0.007	0.000
	9	1.000	1.000	1.000	1.000	0.998	0.993	0.942	0.773	0.473	0.175	0.027	0.001
	10	1.000	1.000	1.000	1.000	1.000	0.998	0.981	0.895	0.671	0.340	0.082	0.003
	11	1.000	1.000	1.000	1.000	1.000	1.000	0.995	0.962	0.833	0.550	0.202	0.017
	12	1.000	1.000	1.000	1.000	1.000	1.000	0.999	0.989	0.935	0.754	0.402	0.068
	13	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.998	0.982	0.901	0.648	0.211
	14	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.997	0.974	0.859	0.485
	15	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.997	0.972	0.815
17	0	0.418	0.167	0.063	0.023	0.008	0.002	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.792	0.482	0.252	0.118	0.050	0.019	0.002	0.000	0.000	0.000	0.000	0.000
	2	0.950	0.762	0.520	0.310	0.164	0.077	0.012	0.001	0.000	0.000	0.000	0.000
	3	0.991	0.917	0.756	0.549	0.353	0.202	0.046	0.006	0.000	0.000	0.000	0.000
	4	0.999	0.978	0.901	0.758	0.574	0.389	0.126	0.025	0.003	0.000	0.000	0.000
	5	1.000	0.995	0.968	0.894	0.765	0.597	0.264	0.072	0.011	0.001	0.000	0.000
	6	1.000	0.999	0.992	0.962	0.893	0.775	0.448	0.166	0.035	0.003	0.000	0.000
	7	1.000	1.000	0.998	0.989	0.960	0.895	0.641	0.315	0.092	0.013	0.000	0.000
	8	1.000	1.000	1.000	0.997	0.988	0.960	0.801	0.500	0.199	0.040	0.003	0.000
	9	1.000	1.000	1.000	1.000	0.997	0.987	0.908	0.685	0.359	0.105	0.011	0.000
	10	1.000	1.000	1.000	1.000	0.999	0.997	0.965	0.834	0.552	0.225	0.038	0.001
	11	1.000	1.000	1.000	1.000	1.000	0.999	0.989	0.928	0.736	0.403	0.106	0.005
	12	1.000	1.000	1.000	1.000	1.000	1.000	0.997	0.975	0.874	0.611	0.242	0.022
	13	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.994	0.954	0.798	0.451	0.083
	14	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.999	0.988	0.923	0.690	0.238
	15	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.998	0.981	0.882	0.518
	16	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.998	0.977	0.833
18	0	0.397	0.150	0.054	0.018	0.006	0.002	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.774	0.450	0.224	0.099	0.039	0.014	0.001	0.000	0.000	0.000	0.000	0.000
	2	0.942	0.734	0.480	0.271	0.135	0.060	0.008	0.001	0.000	0.000	0.000	0.000
	3	0.989	0.902	0.720	0.501	0.306	0.165	0.033	0.004	0.000	0.000	0.000	0.000
	4	0.998	0.972	0.879	0.716	0.519	0.333	0.094	0.015	0.001	0.000	0.000	0.000
	5	1.000	0.994	0.958	0.867	0.717	0.534	0.209	0.048	0.006	0.000	0.000	0.000
	6	1.000	0.999	0.988	0.949	0.861	0.722	0.374	0.119	0.020	0.001	0.000	0.000
	7	1.000	1.000	0.997	0.984	0.943	0.859	0.563	0.240	0.058	0.006	0.000	0.000
	8	1.000	1.000	0.999	0.996	0.981	0.940	0.737	0.407	0.135	0.021	0.001	0.000

BINOMISK FORDELING: $P(X \leq x)$

		p											
n	x	0.05	0.1	0.15	0.2	0.25	0.3	0.4	0.5	0.6	0.7	0.8	0.9
18	9	1.000	1.000	1.000	0.999	0.995	0.979	0.865	0.593	0.263	0.060	0.004	0.000
	10	1.000	1.000	1.000	1.000	0.999	0.994	0.942	0.760	0.437	0.141	0.016	0.000
	11	1.000	1.000	1.000	1.000	1.000	0.999	0.980	0.881	0.626	0.278	0.051	0.001
	12	1.000	1.000	1.000	1.000	1.000	1.000	0.994	0.952	0.791	0.466	0.133	0.006
	13	1.000	1.000	1.000	1.000	1.000	1.000	0.999	0.985	0.906	0.667	0.284	0.028
	14	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.996	0.967	0.835	0.499	0.098
	15	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.999	0.992	0.940	0.729	0.266
	16	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.999	0.986	0.901	0.550
	17	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.998	0.982	0.850
19	0	0.377	0.135	0.046	0.014	0.004	0.001	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.755	0.420	0.198	0.083	0.031	0.010	0.001	0.000	0.000	0.000	0.000	0.000
	2	0.933	0.705	0.441	0.237	0.111	0.046	0.005	0.000	0.000	0.000	0.000	0.000
	3	0.987	0.885	0.684	0.455	0.263	0.133	0.023	0.002	0.000	0.000	0.000	0.000
	4	0.998	0.965	0.856	0.673	0.465	0.282	0.070	0.010	0.001	0.000	0.000	0.000
	5	1.000	0.991	0.946	0.837	0.668	0.474	0.163	0.032	0.003	0.000	0.000	0.000
	6	1.000	0.998	0.984	0.932	0.825	0.666	0.308	0.084	0.012	0.001	0.000	0.000
	7	1.000	1.000	0.996	0.977	0.923	0.818	0.488	0.180	0.035	0.003	0.000	0.000
	8	1.000	1.000	0.999	0.993	0.971	0.916	0.667	0.324	0.088	0.011	0.000	0.000
	9	1.000	1.000	1.000	0.998	0.991	0.967	0.814	0.500	0.186	0.033	0.002	0.000
	10	1.000	1.000	1.000	1.000	0.998	0.989	0.912	0.676	0.333	0.084	0.007	0.000
	11	1.000	1.000	1.000	1.000	1.000	0.997	0.965	0.820	0.512	0.182	0.023	0.000
	12	1.000	1.000	1.000	1.000	1.000	0.999	0.988	0.916	0.692	0.334	0.068	0.002
	13	1.000	1.000	1.000	1.000	1.000	1.000	0.997	0.968	0.837	0.526	0.163	0.009
	14	1.000	1.000	1.000	1.000	1.000	1.000	0.999	0.990	0.930	0.718	0.327	0.035
	15	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.998	0.977	0.867	0.545	0.115
	16	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.995	0.954	0.763	0.295
	17	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.999	0.990	0.917	0.580
	18	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.999	0.986	0.865
20	0	0.358	0.122	0.039	0.012	0.003	0.001	0.000	0.000	0.000	0.000	0.000	0.000
	1	0.736	0.392	0.176	0.069	0.024	0.008	0.001	0.000	0.000	0.000	0.000	0.000
	2	0.925	0.677	0.405	0.206	0.091	0.035	0.004	0.000	0.000	0.000	0.000	0.000
	3	0.984	0.867	0.648	0.411	0.225	0.107	0.016	0.001	0.000	0.000	0.000	0.000
	4	0.997	0.957	0.830	0.630	0.415	0.238	0.051	0.006	0.000	0.000	0.000	0.000
	5	1.000	0.989	0.933	0.804	0.617	0.416	0.126	0.021	0.002	0.000	0.000	0.000
	6	1.000	0.998	0.978	0.913	0.786	0.608	0.250	0.058	0.006	0.000	0.000	0.000
	7	1.000	1.000	0.994	0.968	0.898	0.772	0.416	0.132	0.021	0.001	0.000	0.000
	8	1.000	1.000	0.999	0.990	0.959	0.887	0.596	0.252	0.057	0.005	0.000	0.000
	9	1.000	1.000	1.000	0.997	0.986	0.952	0.755	0.412	0.128	0.017	0.001	0.000
	10	1.000	1.000	1.000	0.999	0.996	0.983	0.872	0.588	0.245	0.048	0.003	0.000
	11	1.000	1.000	1.000	1.000	0.999	0.995	0.943	0.748	0.404	0.113	0.010	0.000
	12	1.000	1.000	1.000	1.000	1.000	0.999	0.979	0.868	0.584	0.228	0.032	0.000
	13	1.000	1.000	1.000	1.000	1.000	1.000	0.994	0.942	0.750	0.392	0.087	0.002
	14	1.000	1.000	1.000	1.000	1.000	1.000	0.998	0.979	0.874	0.584	0.196	0.011

BINOMISK FORDELING: $P(X \leq x)$

		p											
n	x	0.05	0.1	0.15	0.2	0.25	0.3	0.4	0.5	0.6	0.7	0.8	0.9
20	15	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.994	0.949	0.762	0.370	0.043
	16	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.999	0.984	0.893	0.589	0.133
	17	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.996	0.965	0.794	0.323
	18	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.999	0.992	0.931	0.608
	19	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.999	0.988	0.878

POISSONFORDELING: $P(X_t \leq x)$

	λt						
x	0.1	0.5	1.0	1.5	2.0	2.5	3.0
0	0.9048	0.6065	0.3679	0.2231	0.1353	0.0821	0.0498
1	0.9953	0.9098	0.7358	0.5578	0.4060	0.2873	0.1991
2	0.9998	0.9856	0.9197	0.8088	0.6767	0.5438	0.4232
3	1.0000	0.9982	0.9810	0.9344	0.8571	0.7576	0.6472
4	1.0000	0.9998	0.9963	0.9814	0.9473	0.8912	0.8153
5	1.0000	1.0000	0.9994	0.9955	0.9834	0.9580	0.9161
6	1.0000	1.0000	0.9999	0.9991	0.9955	0.9858	0.9665
7	1.0000	1.0000	1.0000	0.9998	0.9989	0.9958	0.9881
8	1.0000	1.0000	1.0000	1.0000	0.9998	0.9989	0.9962
9	1.0000	1.0000	1.0000	1.0000	1.0000	0.9997	0.9989
10	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999	0.9997
11	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999
12	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

	λt						
x	3.5	4.0	4.5	5.0	5.5	6.0	6.5
0	0.0302	0.0183	0.0111	0.0067	0.0041	0.0025	0.0015
1	0.1359	0.0916	0.0611	0.0404	0.0266	0.0174	0.0113
2	0.3208	0.2381	0.1736	0.1247	0.0884	0.0620	0.0430
3	0.5366	0.4335	0.3423	0.2650	0.2017	0.1512	0.1118
4	0.7254	0.6288	0.5321	0.4405	0.3575	0.2851	0.2237
5	0.8576	0.7851	0.7029	0.6160	0.5289	0.4457	0.3690
6	0.9347	0.8893	0.8311	0.7622	0.6860	0.6063	0.5265
7	0.9733	0.9489	0.9134	0.8666	0.8095	0.7440	0.6728
8	0.9901	0.9786	0.9597	0.9319	0.8944	0.8472	0.7916
9	0.9967	0.9919	0.9829	0.9682	0.9462	0.9161	0.8774
10	0.9990	0.9972	0.9933	0.9863	0.9747	0.9574	0.9332
11	0.9997	0.9991	0.9976	0.9945	0.9890	0.9799	0.9661
12	0.9999	0.9997	0.9992	0.9980	0.9955	0.9912	0.9840
13	1.0000	0.9999	0.9997	0.9993	0.9983	0.9964	0.9929
14	1.0000	1.0000	0.9999	0.9998	0.9994	0.9986	0.9970
15	1.0000	1.0000	1.0000	0.9999	0.9998	0.9995	0.9988
16	1.0000	1.0000	1.0000	1.0000	0.9999	0.9998	0.9996
17	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999	0.9998
18	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999
19	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

POISSONFORDELING: $P(X_t \leq x)$

	λt						
x	7.0	7.5	8.0	8.5	9.0	9.5	10.0
0	0.0009	0.0006	0.0003	0.0002	0.0001	0.0001	0.0000
1	0.0073	0.0047	0.0030	0.0019	0.0012	0.0008	0.0005
2	0.0296	0.0203	0.0138	0.0093	0.0062	0.0042	0.0028
3	0.0818	0.0591	0.0424	0.0301	0.0212	0.0149	0.0103
4	0.1730	0.1321	0.0996	0.0744	0.0550	0.0403	0.0293
5	0.3007	0.2414	0.1912	0.1496	0.1157	0.0885	0.0671
6	0.4497	0.3782	0.3134	0.2562	0.2068	0.1649	0.1301
7	0.5987	0.5246	0.4530	0.3856	0.3239	0.2687	0.2202
8	0.7291	0.6620	0.5925	0.5231	0.4557	0.3918	0.3328
9	0.8305	0.7764	0.7166	0.6530	0.5874	0.5218	0.4579
10	0.9015	0.8622	0.8159	0.7634	0.7060	0.6453	0.5830
11	0.9467	0.9208	0.8881	0.8487	0.8030	0.7520	0.6968
12	0.9730	0.9573	0.9362	0.9091	0.8758	0.8364	0.7916
13	0.9872	0.9784	0.9658	0.9486	0.9261	0.8981	0.8645
14	0.9943	0.9897	0.9827	0.9726	0.9585	0.9400	0.9165
15	0.9976	0.9954	0.9918	0.9862	0.9780	0.9665	0.9513
16	0.9990	0.9980	0.9963	0.9934	0.9889	0.9823	0.9730
17	0.9996	0.9992	0.9984	0.9970	0.9947	0.9911	0.9857
18	0.9999	0.9997	0.9993	0.9987	0.9976	0.9957	0.9928
19	1.0000	0.9999	0.9997	0.9995	0.9989	0.9980	0.9965
20	1.0000	1.0000	0.9999	0.9998	0.9996	0.9991	0.9984
21	1.0000	1.0000	1.0000	0.9999	0.9998	0.9996	0.9993
22	1.0000	1.0000	1.0000	1.0000	0.9999	0.9999	0.9997
23	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999	0.9999
24	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

STANDARD NORMALFORDELING: $\Phi(z) = P(Z \leq z)$

z	_._0	_._1	_._2	_._3	_._4	_._5	_._6	_._7	_._8	_._9
-3.7	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
-3.6	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
-3.5	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
-3.4	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0002
-3.3	0.0005	0.0005	0.0005	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0003
-3.2	0.0007	0.0007	0.0006	0.0006	0.0006	0.0006	0.0006	0.0005	0.0005	0.0005
-3.1	0.0010	0.0009	0.0009	0.0009	0.0008	0.0008	0.0008	0.0008	0.0007	0.0007
-3.0	0.0013	0.0013	0.0013	0.0012	0.0012	0.0011	0.0011	0.0011	0.0010	0.0010
-2.9	0.0019	0.0018	0.0018	0.0017	0.0016	0.0016	0.0015	0.0015	0.0014	0.0014
-2.8	0.0026	0.0025	0.0024	0.0023	0.0023	0.0022	0.0021	0.0021	0.0020	0.0019
-2.7	0.0035	0.0034	0.0033	0.0032	0.0031	0.0030	0.0029	0.0028	0.0027	0.0026
-2.6	0.0047	0.0045	0.0044	0.0043	0.0041	0.0040	0.0039	0.0038	0.0037	0.0036
-2.5	0.0062	0.0060	0.0059	0.0057	0.0055	0.0054	0.0052	0.0051	0.0049	0.0048
-2.4	0.0082	0.0080	0.0078	0.0075	0.0073	0.0071	0.0069	0.0068	0.0066	0.0064
-2.3	0.0107	0.0104	0.0102	0.0099	0.0096	0.0094	0.0091	0.0089	0.0087	0.0084
-2.2	0.0139	0.0136	0.0132	0.0129	0.0125	0.0122	0.0119	0.0116	0.0113	0.0110
-2.1	0.0179	0.0174	0.0170	0.0166	0.0162	0.0158	0.0154	0.0150	0.0146	0.0143
-2.0	0.0228	0.0222	0.0217	0.0212	0.0207	0.0202	0.0197	0.0192	0.0188	0.0183
-1.9	0.0287	0.0281	0.0274	0.0268	0.0262	0.0256	0.0250	0.0244	0.0239	0.0233
-1.8	0.0359	0.0351	0.0344	0.0336	0.0329	0.0322	0.0314	0.0307	0.0301	0.0294
-1.7	0.0446	0.0436	0.0427	0.0418	0.0409	0.0401	0.0392	0.0384	0.0375	0.0367
-1.6	0.0548	0.0537	0.0526	0.0516	0.0505	0.0495	0.0485	0.0475	0.0465	0.0455
-1.5	0.0668	0.0655	0.0643	0.0630	0.0618	0.0606	0.0594	0.0582	0.0571	0.0559
-1.4	0.0808	0.0793	0.0778	0.0764	0.0749	0.0735	0.0721	0.0708	0.0694	0.0681
-1.3	0.0968	0.0951	0.0934	0.0918	0.0901	0.0885	0.0869	0.0853	0.0838	0.0823
-1.2	0.1151	0.1131	0.1112	0.1093	0.1075	0.1056	0.1038	0.1020	0.1003	0.0985
-1.1	0.1357	0.1335	0.1314	0.1292	0.1271	0.1251	0.1230	0.1210	0.1190	0.1170
-1.0	0.1587	0.1562	0.1539	0.1515	0.1492	0.1469	0.1446	0.1423	0.1401	0.1379
-0.9	0.1841	0.1814	0.1788	0.1762	0.1736	0.1711	0.1685	0.1660	0.1635	0.1611
-0.8	0.2119	0.2090	0.2061	0.2033	0.2005	0.1977	0.1949	0.1922	0.1894	0.1867
-0.7	0.2420	0.2389	0.2358	0.2327	0.2296	0.2266	0.2236	0.2206	0.2177	0.2148
-0.6	0.2743	0.2709	0.2676	0.2643	0.2611	0.2578	0.2546	0.2514	0.2483	0.2451
-0.5	0.3085	0.3050	0.3015	0.2981	0.2946	0.2912	0.2877	0.2843	0.2810	0.2776
-0.4	0.3446	0.3409	0.3372	0.3336	0.3300	0.3264	0.3228	0.3192	0.3156	0.3121
-0.3	0.3821	0.3783	0.3745	0.3707	0.3669	0.3632	0.3594	0.3557	0.3520	0.3483
-0.2	0.4207	0.4168	0.4129	0.4090	0.4052	0.4013	0.3974	0.3936	0.3897	0.3859
-0.1	0.4602	0.4562	0.4522	0.4483	0.4443	0.4404	0.4364	0.4325	0.4286	0.4247
-0.0	0.5000	0.4960	0.4920	0.4880	0.4840	0.4801	0.4761	0.4721	0.4681	0.4641

STANDARD NORMALFORDELING: $\Phi(z) = P(Z \leq z)$

z	_._0	_._1	_._2	_._3	_._4	_._5	_._6	_._7	_._8	_._9
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	0.7704	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	0.9015
1.3	0.9032	0.9049	0.9066	0.9082	0.9099	0.9115	0.9131	0.9147	0.9162	0.9177
1.4	0.9192	0.9207	0.9222	0.9236	0.9251	0.9265	0.9279	0.9292	0.9306	0.9319
1.5	0.9332	0.9345	0.9357	0.9370	0.9382	0.9394	0.9406	0.9418	0.9429	0.9441
1.6	0.9452	0.9463	0.9474	0.9484	0.9495	0.9505	0.9515	0.9525	0.9535	0.9545
1.7	0.9554	0.9564	0.9573	0.9582	0.9591	0.9599	0.9608	0.9616	0.9625	0.9633
1.8	0.9641	0.9649	0.9656	0.9664	0.9671	0.9678	0.9686	0.9693	0.9699	0.9706
1.9	0.9713	0.9719	0.9726	0.9732	0.9738	0.9744	0.9750	0.9756	0.9761	0.9767
2.0	0.9772	0.9778	0.9783	0.9788	0.9793	0.9798	0.9803	0.9808	0.9812	0.9817
2.1	0.9821	0.9826	0.9830	0.9834	0.9838	0.9842	0.9846	0.9850	0.9854	0.9857
2.2	0.9861	0.9864	0.9868	0.9871	0.9875	0.9878	0.9881	0.9884	0.9887	0.9890
2.3	0.9893	0.9896	0.9898	0.9901	0.9904	0.9906	0.9909	0.9911	0.9913	0.9916
2.4	0.9918	0.9920	0.9922	0.9925	0.9927	0.9929	0.9931	0.9932	0.9934	0.9936
2.5	0.9938	0.9940	0.9941	0.9943	0.9945	0.9946	0.9948	0.9949	0.9951	0.9952
2.6	0.9953	0.9955	0.9956	0.9957	0.9959	0.9960	0.9961	0.9962	0.9963	0.9964
2.7	0.9965	0.9966	0.9967	0.9968	0.9969	0.9970	0.9971	0.9972	0.9973	0.9974
2.8	0.9974	0.9975	0.9976	0.9977	0.9977	0.9978	0.9979	0.9979	0.9980	0.9981
2.9	0.9981	0.9982	0.9982	0.9983	0.9984	0.9984	0.9985	0.9985	0.9986	0.9986
3.0	0.9987	0.9987	0.9987	0.9988	0.9988	0.9989	0.9989	0.9989	0.9990	0.9990
3.1	0.9990	0.9991	0.9991	0.9991	0.9992	0.9992	0.9992	0.9992	0.9993	0.9993
3.2	0.9993	0.9993	0.9994	0.9994	0.9994	0.9994	0.9994	0.9995	0.9995	0.9995
3.3	0.9995	0.9995	0.9995	0.9996	0.9996	0.9996	0.9996	0.9996	0.9996	0.9997
3.4	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9998
3.5	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998
3.6	0.9998	0.9998	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999
3.7	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999

Kritiske verdier i standard normalfordelingen

$$P(Z > z_\alpha) = \alpha$$

α	z_α
0.20	0.842
0.10	1.282
0.05	1.645
0.025	1.960
0.02	2.054
0.01	2.326
0.005	2.576
0.001	3.090
0.0005	3.291
0.0001	3.719

Kritiske verdier i t-fordelingen.

$$P(T > t_{\alpha,\nu}) = \alpha$$

	α							
ν	0.2	0.1	0.05	0.025	0.01	0.005	0.001	0.0005
1	1.376	3.078	6.314	12.706	31.821	63.657	318.309	636.619
2	1.061	1.886	2.920	4.303	6.965	9.925	22.327	31.599
3	0.978	1.638	2.353	3.182	4.541	5.841	10.215	12.924
4	0.941	1.533	2.132	2.776	3.747	4.604	7.173	8.610
5	0.920	1.476	2.015	2.571	3.365	4.032	5.893	6.869
6	0.906	1.440	1.943	2.447	3.143	3.707	5.208	5.959
7	0.896	1.415	1.895	2.365	2.998	3.499	4.785	5.408
8	0.889	1.397	1.860	2.306	2.896	3.355	4.501	5.041
9	0.883	1.383	1.833	2.262	2.821	3.250	4.297	4.781
10	0.879	1.372	1.812	2.228	2.764	3.169	4.144	4.587
11	0.876	1.363	1.796	2.201	2.718	3.106	4.025	4.437
12	0.873	1.356	1.782	2.179	2.681	3.055	3.930	4.318
13	0.870	1.350	1.771	2.160	2.650	3.012	3.852	4.221
14	0.868	1.345	1.761	2.145	2.624	2.977	3.787	4.140
15	0.866	1.341	1.753	2.131	2.602	2.947	3.733	4.073
16	0.865	1.337	1.746	2.120	2.583	2.921	3.686	4.015
17	0.863	1.333	1.740	2.110	2.567	2.898	3.646	3.965
18	0.862	1.330	1.734	2.101	2.552	2.878	3.610	3.922
19	0.861	1.328	1.729	2.093	2.539	2.861	3.579	3.883
20	0.860	1.325	1.725	2.086	2.528	2.845	3.552	3.850
21	0.859	1.323	1.721	2.080	2.518	2.831	3.527	3.819
22	0.858	1.321	1.717	2.074	2.508	2.819	3.505	3.792
23	0.858	1.319	1.714	2.069	2.500	2.807	3.485	3.768
24	0.857	1.318	1.711	2.064	2.492	2.797	3.467	3.745
25	0.856	1.316	1.708	2.060	2.485	2.787	3.450	3.725
26	0.856	1.315	1.706	2.056	2.479	2.779	3.435	3.707
27	0.855	1.314	1.703	2.052	2.473	2.771	3.421	3.690
28	0.855	1.313	1.701	2.048	2.467	2.763	3.408	3.674
29	0.854	1.311	1.699	2.045	2.462	2.756	3.396	3.659
30	0.854	1.310	1.697	2.042	2.457	2.750	3.385	3.646
35	0.852	1.306	1.690	2.030	2.438	2.724	3.340	3.591
40	0.851	1.303	1.684	2.021	2.423	2.704	3.307	3.551
50	0.849	1.299	1.676	2.009	2.403	2.678	3.261	3.496
100	0.845	1.290	1.660	1.984	2.364	2.626	3.174	3.390
∞	0.842	1.282	1.645	1.960	2.326	2.576	3.090	3.291