

α	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	0.7704	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

Chapter1:	Independent Trials
$(A \cup B)^c = A^c \cap B^c$	$A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$
$P(A - B) = P(A) - P(A \cap B)$	$P(A_1 \cup A_2 \dots) = P(A_1) + P(A_2) \dots$
The probability A given B	$P(A B) = \frac{P(A \cap B)}{P(B)}$
A and B are disjoint:	$P(A B) = \frac{P(A \cap B)}{P(B)} = \frac{0}{P(B)} = 0$
$A \subset B$	$P(A B) = \frac{P(A \cap B)}{P(B)} = \frac{P(A)}{P(B)}$
$B \subset A$	$P(A B) = \frac{P(A \cap B)}{P(B)} = \frac{P(B)}{P(B)} = 1$
$P(A \cup B) = P(A) + P(B) - P(A \cap B)$	Disjoint: $P[AB] = 0$
$P[A^c] = 1 - P[A]$	dependent: $P(A \cap B) = P(A)P(B)$
$A - B = A \cap B^c$	إذا عملت اتحاد واعطوني S ويكونون disjoint
$P(A) = \sum_{i=1}^m P(A B_i)P(B_i)$	Bayes' Rule: $P(B A) = \frac{P(A B)P(B)}{P(A)}$
$A_1, A_2, A_3, \dots$ are disjoint events,	
$P(A_1 \cup A_2 \cup A_3 \dots B) = P(A_1 B) + P(A_2 B) + P(A_3 B) + \dots$	
$\frac{P_{23}^{365}}{366^{23}} \rightarrow$ p of no two have the same birthday (from 23) on ch 2	

Chapter2	$P(A) = \frac{ A }{ S } = \frac{M}{N}$	
MultinomialCoefficient: nt:	$\binom{n}{n_1, n_2, \dots, n_r} = \frac{n!}{n_1! n_2! \dots n_r!}.$	
Binomial Formula:	$P(k) = \binom{n}{k} p^k (1-p)^{n-k}$	
Independent Trials:	$P[E_{n_0, n_1}] = \binom{n}{n_1} (1-p)^{n-n_1} p^{n_1}$	
	$P[E_{n_0, n_1}] = \binom{n}{n_0} (1-p)^{n_0} p^{n-n_0}.$	
ordered sampling with replacement	n^k	
ordered sampling without replacement	$P_k^n = \frac{n!}{(n-k)!}$	
unordered sampling without replacement	$\binom{n}{k} = \frac{n!}{k!(n-k)!}$	
unordered sampling with replacement	$\binom{n+k-1}{k}$	
X		
Y	قوانينه	الي تحت
px		
Ey		
$S_Y = \{g(x) x \in S_X\} = \{g(x_1), g(x_2), \dots\}.$		
$P_Y(y_k) = P(Y = y_k) = P(g(X) = y_k).$		

Chapter3: Discrete	PMF
Range(X) = $S_X = \{x_1, x_2, x_3, \dots\}$	$P_X(x_k) = P(X = x_k)$, for $k = 1, 2, 3, \dots$
Bernoulli(p): $E[X] = P$	$P_X(x) = \begin{cases} p & \text{for } x = 1 \\ 1-p & \text{for } x = 0 \\ 0 & \text{otherwise} \end{cases}$ Range(X) = {0, 1}
Geometric(p): $E[X] = \frac{1}{p}$	$P_X(k) = p(1-p)^{k-1}$, $k = 1, 2, 3, \dots$
Binomial(n, p): $E[X] = nP$	$P_X(k) = \binom{n}{k} p^k (1-p)^{n-k}$, $k = 0, 1, 2, \dots, n$
Pascal(k, p): $E[X] = k/P$	$P_X(k) = \binom{k-1}{m-1} p^m (1-p)^{k-m}$ $k = m, m+1, m+2, \dots$
Uniform Random Variables(k, L) $E[X] = (k+L)/2$	$P_X(x_i) = \frac{1}{ S_X }$
CDF: $F_X(x) = P(X \leq x)$	$P(a < X \leq b) = F_X(b) - F_X(a)$
$\sigma_X = \sqrt{\text{Var}(X)}$	$\text{Var}(X) = E[X^2] - (E[X])^2$
$\text{Var}(aX + b) = a^2 \text{Var}(X)$	
Poisson: $\alpha = \lambda t$ $E[X] = \alpha$	$P_X(k) = \frac{e^{-\alpha} \alpha^k}{k!}$, $k = 0, 1, 2, 3, \dots$
$P(X = k) = P_X(k) = \binom{n}{k} p^k (1-p)^{n-k} = \binom{n}{k} \left(\frac{\alpha}{n}\right)^k \left(1 - \frac{\alpha}{n}\right)^{n-k}$	

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