- $X \sim B(n, p)$

$X = \{0, 1, 2, \ldots, n\}$

$p(X=0) = (1-p)^n$

$\because p(AB) = p(A) \cdot p(B)$ if A and B independent

$p(X=1) = n \cdot p \cdot (1-p)^{n-1}$

$p(X=2) = \binom{n}{2} p^2 \cdot (1-p)^{n-2}$

- P(Q) = P(e or fewer errors in n trails)

X: # of error bits

$= p(X=0) + p(X=1) + \cdots p(X=e)$

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r.v. n: # of active users at a time

$n \sim B(35, 0.1)$

$p(\text{congestion}) = p(n \geq 11)$

$= p(n=11) + p(n=12) + \cdots + p(n=35) \approx 0.0004$

$X_1, X_2, \ldots \sim \exp \lambda$

$Y = X_1 + X_2 + X_3 \longrightarrow$ 3rd-Erlang with rate λ

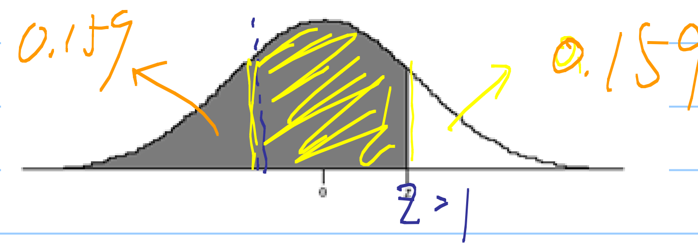
z	F(x)	z	F(x)	z	F(x)
-2.5	0.006	-1	0.159	0.5	0.691
-2.4	0.008	-0.9	0.184	0.6	0.726
-2.3	0.011	-0.8	0.212	0.7	0.758
-2.2	0.014	-0.7	0.242	0.8	0.788
-2.1	0.018	-0.6	0.274	0.9	0.816
-2	0.023	-0.5	0.309	1	0.841
-1.9	0.029	-0.4	0.345	1.1	0.864
-1.8	0.036	-0.3	0.382	1.2	0.885
-1.7	0.045	-0.2	0.421	1.3	0.903
-1.6	0.055	-0.1	0.46	1.4	0.919
-1.5	0.067	0	0.5	1.5	0.933
-1.4	0.081	0.1	0.54	1.6	0.945
-1.3	0.097	0.2	0.579	1.7	0.955
-1.2	0.115	0.3	0.618	1.8	0.964
-1.1	0.136	0.4	0.655	1.9	0.971

$P(Z<0) = 0.5$

$P(Z<-2.5) = 0.006$

$P(Z<1) = 0.841$

$P(X \geq 1) = 1 - P(X<1)$



- $\Phi(-x) = 1 - \Phi(x)$

- $P(X \leq 365) = P\left(Z \leq \frac{365-300}{50}\right) = P(Z \leq 1.3)$
$= 0.903$

$$= \frac{P(X=k+n, X>n)}{P(X>n)} = \frac{P(X=k+n)}{P(X>n)}$$

$\leftarrow$ $P(AB) = P(A)$
if $A \subset B$

A : # < 10 attend

B : < 30 attend class

$\rightarrow P(AB) = P(A)$