

Discrete Distributions

Name	pmf	cdf	E(V);Var
Bernoulli(p)	$P(1)=p; P(0)=1-p$	$F(1)=1, F(0)=1-p$	$p;p(1-p)$
Binomial(n,p)	$P(k)=(N\text{choose}K) p^k (1-p)^{(n-k)}$	-	$np;np(1-p)$
Geometric(p)	$P(k)=(1-p)^{k-1} p$	$1 - (1-p)^k$	$(1-p)/p; (1-p)/p^2$
Poisson(λ)	$P(k)=e^{-\lambda} \lambda^k/k!$	-	$\lambda;\lambda$

Continuous Distributions

Name	pdf	cdf	EV;Var
Uniform[a,b]	$f(x)= 1/(b-a)$ on [a,b]	$F(x)=(x-a)/(b-a)$ on [a,b]	$(b-a)/2; (b-a)^2/12$
Normal(μ, σ^2)	-	-	$\mu; \sigma^2$
Exponential(λ)	$f(x)=\lambda e^{-\lambda x}$	$1 - e^{-\lambda x}$	$1/\lambda; 1/\lambda^2$

Set theory

De Morgan's laws
 $(A \cup B)^c = A^c \cap B^c$ &&&& $(A \cap B)^c = A^c \cup B^c$
 Distributive laws:
 $(A \cup B) \cap C = (A \cap C) \cup (B \cap C)$ &&&& $(A \cap B) \cup C = (A \cup C) \cap (B \cup C)$

Probability

$P(A \cup B) = P(A) + P(B) - P(A \cap B)$
 $N\text{choose}K = n!/(k!(n-k)!)$
 De totale kans is altijd 1! I.h.b. $P(A) + P(A^c) = 1$

Conditional Probability

$P(A|B) = P(A \cap B)/P(B)$
 $A \& B$ independent $\Rightarrow P(A \cap B) = P(A)P(B)$ & $P(A|B) = P(A)$
 Bayes' Theorem: $P(A|B) = P(B|A)P(A)/P(B)$

Er zijn n kleuren, ik kies er k. Ik heb ... opties

-	Volgorde maakt uit	Volgorde maakt niet uit
Kleuren mogen dubbel	n^k	$(n-1+k)!/(n-1)!k!$
Kleuren mogen niet dubbel	$n!/(n-k)!$	$n!/k!(n-k)!$



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