Happiness

Maximum Expected Utility (MEU)

chooses 13, 1 unit of currency

case 1: 13 comes up with 35, keep

case 2: not 13 comes up lose 1

$(+35)\frac{1}{38} + (-1)\frac{37}{38}$

$\frac{35}{38} - \frac{37}{38} = -\frac{2}{38} = -\frac{1}{19}$

$\Omega = \{\omega_1, \omega_2, \ldots, \omega_n\}$ Sample space

$\omega \in \Omega$

$P(\omega)$ probability of ω being the outcome

$0 \leq P(\omega) \leq 1$

$\sum_{\omega \in \Omega} P(\omega) = 1$

Outcome: a, $P(a)$

$P(\neg a) = 1 - P(a)$

outcomes: a, b ; P(a), P(b)

$$P(a \vee b) = P(a) + P(b) - P(a \wedge b)$$

X = random variable

X	P(x)	
a	0.25	|||
b	0.40	||||
c	0.35	||| ||||

X, Y ≡ Random variables.

$X = \{a, b, c\}$ $\quad P(X=a)$

$Y = \{d, e\}$ $\quad P(Y=d)$

$P($

$P($

X \ Y	d	e	
a	0.12	0.13	0.25
b	0.30	0.10	0.40
c	0.05	0.30	0.35
	0.47	0.53	

X \ Y	d	e	
a	0.12	0.13	0.25
b	0.30	0.10	0.40

$P(X=a) = P(X=a, Y$

0.12

0.25

C	0.05	0.30	0.35
	0.47	0.53	

$P(X=a \mid Y=e) =$ —

given

—

Dentist Visit

Cavity = T, F whether you have a cavity

Toothache = T, F whether you have a toothache

Catch = T, F whether you have a soft spot o

Baye

Cavity → Toothache

Cavity → Catch