LECTURE #26

PARADOXES IN PROBABILITY - HOW TO LIE WITH STATISTICS
CONFUSING CORRELATION WITH CAUSATION.
CHILDREN OF PARENTS IN HIGH TAX BRACKETS ARE LIKELY TO EARN MORE

STATISTICS:
(CORRELATION)
① THEORY
② EXPERIMENTS
③ OUTCOME DOES NOT INVALIDATE THEORY AT CERTAIN CONFIANCE LEVEL.

LAW OF LARGE NUMBERS: IN N #’S ABOUT N/2 RUN
LAW OF SMALL NUMBERS:

NY TIMES: ’78
ORCHESTRA CONDUCTORS LIVE 5 YEARS LONGER THAN AVERAGE PERSON
E(AGE OF ORCHESTRA CONDUCTOR) ≥ E(AGE OF PERSON ON STREET AT LEAST 30)

SIMPSON’S PARADOX

NSF SURVEY 77-78 SCIENCE/ENG DEGREES.
BACHELORS WOMEN 77% MALE SALARY.
IN EACH FIELD WOMEN 92% MALE SALARY.

STOCK MARKET

64,000
RISE
RISE ...
FOLLOW FOR 6 WEEKS THEN AFTER TELL WHOMEVER
IS CORRECT “I HAVE BEEN RIGHT FOR 6 WEEKS”

FALL
FALL

MUTUAL FUNDS START OFF SMALL MONEYS W/ RISKY FUND, DROP UNSUCCESSFUL...
GOOD %AGES

TECHNOLOGY...
FINANCIAL OIL...
MARKET REWARDS YOU FOR RISK

E(Var(avg)) < E(Var(xi))

x, x₂, ..., xₙ E(avg) Var(avg)

LOUDNESS ∝ (AMPLITUDE)²

θ RANDINO [0,2π]

x COORD: 1 + cosθ
y COORD: sinθ

|f|² + (1+cosθ)² + sin²θ = 2 + 2cosθ = 2
E(COSθ) = 0.2 ± 0