Stat 19:Fiat Lux, Holdem or Foldem, Probability and Poker

Outline for the day:

1. Addiction
2. Syllabus, etc.
3. Wasicka/Gold/Binger Example
4. Meaning of Probability
5. Axioms of probability.

♠ ♣ ♥ ♦

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Jacob Samuels.

Victoria Tanaka.

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Jason Muljadi.

Liam Roh.

Chad Shimozaki.

Ing Vorakitcharoenphol.

Annie Zhang.

NO CLASS NEXT WEEK, APR9.

For next class Apr 16,

(i) Learn the rules of Texas Hold'em.
(see for instance http://www.fulltiltpoker.net)

(ii) Read addiction handout at course website
http://www.stat.ucla.edu/~frederic/19/S18

Sometime in the next few weeks

(iii) Download R and try it out.
(http://cran.stat.ucla.edu)

Wasicka/Gold/Binger Example

Wasicka/Gold/Binger Example, Continued

Gold: 4♠ 3♣. Binger: A♦ 10♦. Wasicka: 8♠ 7♠.
Flop: 10♣ 6♠ 5♠. (Turn: 7♣. River: Q♠.)

Wasicka folded?!? ♠ ♣ ♥ ♦

He had **8♠ 7♠** and the flop was **10♣ 6♠ 5♠**.
Worst case scenario: suppose he were up against

9♠ 4♠ and **9♥ 9♦**. How could Wasicka win?

88 (3: 8 ♣8♦, 8♣ 8♥, 8♦ 8♥)
77 (3)
44 (3)

[Let "X" = non-49, "Y" = A2378JQK, and "n" = non-🂠]

4n Xn (3 x 32)
9♣ 4n (3)
9♣ Yn (24). **Total: 132 out of 903 = 14.62%.**

Meaning of Probability.

Notation: "P(A) = 60%". A is an *event*.
Not "P(60%)".

Definition of probability:

Frequentist: If repeated independently under the same conditions millions and millions of times, A would happen 60% of the times.

Bayesian: Subjective feeling about how likely something seems.

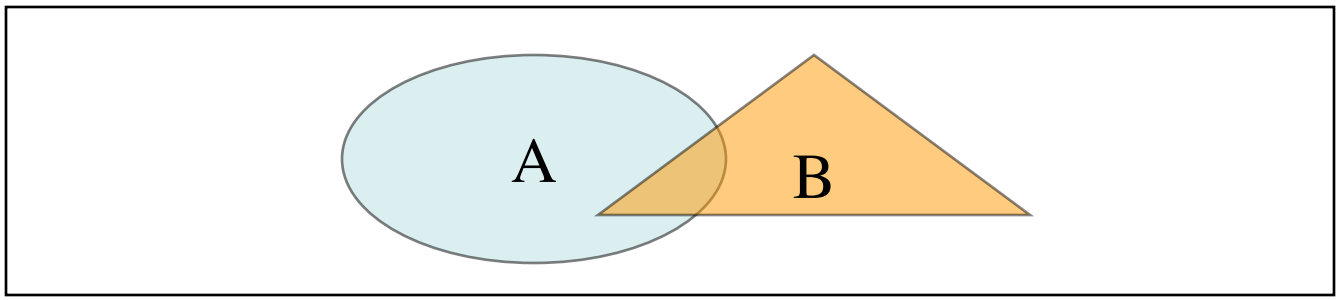
P(A *or* B) means P(A or B or both)
Mutually exclusive: P(A and B) = 0.
Independent: P(A given B) [written "P(A|B)"] = P(A).
$P(A^c)$ means P(not A).

2. Axioms (initial assumptions/rules) of probability:

1) $P(A) \geq 0$.
2) $P(A) + P(A^c) = 1$.
3) If $A_1, A_2, A_3, \ldots$ are mutually exclusive, then
   $P(A_1 \text{ or } A_2 \text{ or } A_3 \text{ or } \ldots) = P(A_1) + P(A_2) + P(A_3) + \ldots$

(#3 is sometimes called the *addition rule*)

Probability <=> Area. Measure theory, Venn diagrams



P(A or B) = P(A) + P(B) - P(A and B).