Scribe Report 4/14/14

The first portion of the class Dr. Scott discussed the time he was on TV. He forgot to file his taxes, and the TV station saw that he was in a hurry. When interviewed, Scott said: “I’ve never seen a post office so big in my life!”

Next, we reviewed the homework.

1.A)

D = Has the SOS
T = Tests positive
P(D/T) = P(D)*P(T/D)/P(T) = .086

P(D) = 1/1000
P(T/D) = .95
P(T) = ?
P(T) = P(T&D) +P(T&~D) = P(D)*P(T/D) + P(~D)*P(T/~D)

Small fraction of large population of false positives outweigh the positives of those who do have it.

B)

Total Costs = $10*10,000,000 + $5,000,000
Total Benefits = 10,000*9,500 = $95,000,000

C)

$11,050 (algebra, not covered in class)

2. A)

P(win) + P(lose) = 1
P(lose) = (⅚)^4 = .482
P(win) = 1 - .482 = .518

B)

P(6 wins or more) = P(6w) +...+ P(10w)
P(6w) = (10 6)* .518^6*(1-.518)^4 = .42

(10 6) = total # of ways to win 6 and lose 4 in 10 games
518^6*(1-.518)^4 = probability of any individual sequence with 6 wins and 4 losses

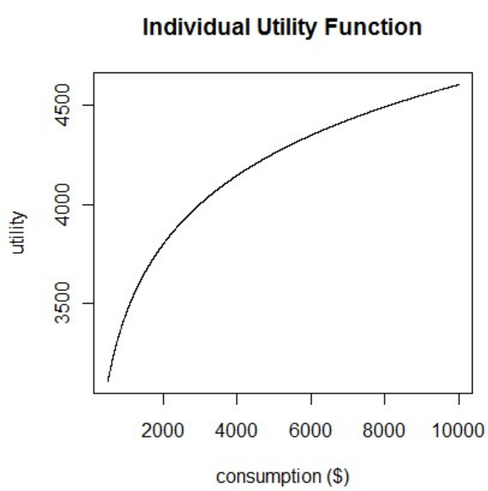
3. We began to go over it, but Dr. Scott stopped and said we'd go over another decision tree problem on Wednesday because he grabbed the wrong answer key.

We then looked at Utility...

Utility Function

Decision: Choice A - .5 chance of $40,000,000, .5 chance of $0
Choice B - $10,000,000

Most people would choose $10,000,000. Although Choice A has a higher expected return (.5*$40,000,000>$10,000,000), the law of diminishing returns (utility) indicates that a given $10,000,000 is probably enough to outweigh the 50/50 shot at $40,000,000.



Shape of the Utility graph

<u>Expected Utility:</u> E(U(x)) where U is our utility function

Our problem above can now be adjusted by the utility function

The expected value of now flipping the coin is 0.5 * U(40,000,000) + 0.5 * U(0), and the value of taking the 10,000,000 (Choice C) dollars is U(10,000,000).

E(U(c)) = U(10,000,000)

-This decision depends entirely on the utility function

C is the best choice <u>**IF**</u> U(10 million) > 0.5*(U(40 milion)) + 0.5*(U(0))

- To get the utility function, one needs ton to think about gambles
For Dr. Scott:

U(10 million)> 0.5*(U(40 milion)) + 0.5*(U(0))

Utilities are <u>**subjective**</u>**!**

- There are constraints on utility functions to hold true requirements for U function…

<u>**Requirements for U function**</u>

1. P and Q are lotteries
    - Either P>Q, Q>P, or P~Q
    - Completeness

2. Transitivity
    - If P>Q and Q>R…
    - Then P>R

3. “Split the difference”

4. “Irrelevent Option”

    -- Look at page 4 & 5 in course packet for more details

<u>**What are real utility functions?**</u>

<u>**Log Utility**</u>
“risky” utility function - All U functions are risk averse, but this is the most risky

U(wealth) = log(w) “Kelly Criterion”

<u>**Isoeleastic Utilites**</u>

U(w) = ((w^(1-gamma) - 1)/(1-gamma)   Where gamma >1

The higher the gamma, the more risk averse, the faster the plateau of utility/$

Gamma = 1 = log(w)