

Test about Part III *With solutions*

1.
  - What does the local representativeness assumption mean for random sequences?  
*That there was a law of small numbers, whereby small samples are perceived to represent their population to the same extent as large samples.*
  - Give a property of random sequences under which this assumption is not valid.  
*Independence*
  - What does belief in hot hand mean?  
The confidence that after a long run of one kind of outcome it is likely to obtain more of these.
  
2.
  - Group A is given 5 seconds to estimate the product  $8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1$ .  
Group B is given 5 seconds to estimate the product  $1 \times 2 \times 3 \times 4 \times 5 \times 6 \times 7 \times 8$ .  
For Group A the median guess is 2250, for Group B the median guess is 512.  
Give an explanation for the observed difference.  
*This is due to the anchoring bias. Group A first sees the larger numbers shaping their idea of result, while Group B first sees the smaller numbers leading a smaller estimate.*
  - Give one other example for the same human bias.  
*See lecture notes week 8 for examples.*
  
3. A certain town is served by two hospitals. In the larger hospital about 45 babies are born each day, and in the smaller hospital about 15 babies are born each day. As you know, about 50% of all babies are boys. However, the exact percentage varies from day to day. Sometimes it may be higher than 50%, sometimes lower. For a period of 1 year, each hospital recorded the days on which more than 60% of the babies born were boys. Which hospital do you think recorded more such days? Explain why.  
  
THE SMALLER HOSPITAL  
*Smaller samples are more variable.*
  
4. The Allais paradox points at a limitation of expected utility theory. Explain?  
*People value certainty so high that it can not be compensated for by any utility function.*  
  
The Ellsberg paradox also points at a limitation of expected utility theory. Explain?  
*People avoid ambiguity. They prefer known to unknown risks.*

5. Which rule of probability is hurt in empirical findings about the Linda problem?

$$P(A \cap B) < P(A)$$

What is the name for the underlying human fallacy? *Conjunction fallacy.*

6. A cab was involved in a hit and run accident at night. Two cab companies, the Green and the Blue, operate in the city. 85% of the cabs in the city are Green and 15% are Blue. A witness identified the cab as Blue. The court tested the reliability of the witness under the same circumstances that existed on the night of the accident and concluded that the witness correctly identified each one of the two colours 80% of the time and failed 20% of the time. What is the probability that the cab involved in the accident was Blue rather than Green?

*41% (see Week 9, Lecture 2 for the calculation)*

Most people answer the probability for Blue is 50% to 80%. Why?

*They neglect the base rater (or underestimate its relevance).*

7. Briefly explain the definitions of normative and descriptive theory of decision making.

*Normative theory: How an idealised (rational) being would take decisions, based on mathematical axioms and optimisation.*

*Descriptive theory: How people actually make decisions, based on empirical studies.*

Why is normative theory not enough?

*Empirical studies have demonstrated that people do not always follow the axioms of probability (biases, fallacies, heuristics).*

8. Name the key ingredients of prospect theory and explain briefly what they are.

*Probability weighting is an S-shaped function applied to raw probabilities to express human tendencies to under-rate large probabilities (relative to certainty) and overrate small probabilities (if larger than 0). Value function expression different attitude to losses than gains. Reference point emphasising the importance of a subjective value to which gains/losses are being compared.*

9. Name a major difference between a field study and a lab experiment.

*Possible answers see Week 10, Lecture 2 slides.*

10. Define *homo economicus*.

*Using rational assessments, homo economicus attempts to maximize utility as a consumer and economic profit as a producer.*

11. What is confirmation bias?

*Searching/selecting information in a way that it confirms existing beliefs.*