

Based on class 1

1. Shortly describe what is a proposition. Name and shortly describe two types of attitudes that we can take towards propositions focus on how they differ from each other). Give 2 concrete examples of such attitudes for each type.
2. Name and describe three doxastic attitudes. Describe their positive and problematic features.
3. What is belief closure and Belief consistency. What is (describe) the Lottery paradox. Why is it a paradox? What is an Acceptance Closure and what role it plays in the Lottery paradox?
4. What is (describe) the Preface paradox. Why is it a paradox? On what criticism of the Lottery paradox it reacts on?
5. What is Lockean thesis. What is its goal (purpose)? Describe how credences and Lockean thesis may help to solve the Lottery Paradox (see also the last slide of Class 2).

Based on class 2

1. Give a concrete example how we can model propositions as sets of possible worlds. Shortly describe what possible worlds are (use pictures if needed).
2. What is a partition and give an example of a partition.
3. What is Probabilism? What does it say?
4. Name and describe Kolmogorov's axioms. Describe the following consequences (negation, entailment, equivalence, partition, and contradiction). You are **not** asked to derive those consequences from the axioms.
5. Describe the Conjunction fallacy. Why is it a fallacy?

Based on classes 3 and 4

1. Shortly describe the main idea behind the Dutch Book Arguments.
2. Explain what is a fair game.
3.
 - (a) What is a betting quotient (quotient ratio)?
 - (b) What is the stake in a game?
 - (c) What is a fair price of a game?
 - (d) How betting quotient and fair price relate to each other?
 - (e) How does betting quotient relates to degrees of belief in a fair game?

4. Imagine the following scenario and answer the following questions:

Your uncle offers you a free lottery ticket for your birthday. There are 200 tickets in total and only one ticket wins 100 zł. All the losing tickets get 0 zł.

- (a) What is the expected value of your ticket in zł (show how you derived the fair price)?
 - (b) Should you accept the ticket (you care only about money) and why?
 - (c) Can you say something general about games which cost you nothing to play?
 - (d) What would be the fair price from your uncle's perspective and why (show how you derived the fair price)?
 - (e) Explain what makes that price fair.
 - (f) What fair price means in terms of consequences buying/selling a ticket?
5. Explain why do we use expected value to evaluate profitability, for example, of the tickets?
6. Imagine the following scenario and answer the following questions:

Your nanny offers you a lottery ticket for your birthday. There are 50 tickets in total and only one ticket wins 200 zł. All the losing tickets get 0 zł. She paid 4 zł for the ticket and wants you to pay her 4 zł for the ticket (before she gives the ticket to you).

- (a) What is the expected value of your ticket in zł (show how you derived the fair price)?
 - (b) Should you accept the ticket (you care only about money) and why?
 - (c) Can you say something general about games which cost you nothing to play?
 - (d) What would be the fair price from your nanny's perspective and why (show how you derived the fair price)?
 - (e) Explain what makes that price fair.
 - (f) What fair price means in terms of consequences buying/selling a ticket?
7. (a) What is a Dutch Book?
(b) What does the Dutch Book theorem say?
(c) Formulate the Dutch Book argument.
8. (a) What does Converse Dutch Book theorem say?

- (b) What are the versions of Converse Dutch Book theorem (one we want and one we get). What do they say?
 - (c) Give an example why the Converse Dutch Book theorem that we want does not hold
9. What is the Package principle?
 10. What is the connection between credences and fair prices in Dutch Books. What that connection is problematic?
 11. Name and explain two simplifying assumptions that we make when using Dutch Books.
 12. My credence in the tautology is 1.2. Which probabilistic norm do I violate? Construct a Dutch book against me.
 13. My credence in the tautology is -0.4 . Which probabilistic norm do I violate? Construct a Dutch book against me.
 14. My credences in propositions X and $\neg X$ are 0.6 and 0.8 respectively. Construct a Dutch Book against me.

Based on class 5

1. What is a relation of the Dutch Book argument to pragmatic and epistemic irrationality?
2. What do we mean when we say that betting scenarios are only dramatic devices?
3. Explain what is the divided-mind inconsistency. How does it relate betting scenarios to epistemic inconsistency?
4. Explain what are de pragmatized Dutch Books of Howson & Urbach and Christensen. How they relate betting scenarios to epistemic irrationality. What issues these de pragmatized Dutch Books have?
5. What is the central idea of the Accuracy arguments?
6. Name and shortly describes four tools that we need to formulate an accuracy argument.
7. What do Alethic vindication and Perfectionism say?
8. What are the differences between metrics and accuracy measures (what properties metrics have that accuracy measure do not possess). What is the name of accuracy measures in mathematical jargon? Give one concrete example of a legitimate (in)accuracy measure.
9. Explain what it means for an accuracy measure to be strictly proper.

- Suppose that I have credence 0.7 in X and 0.5 in $\neg X$. What does accuracy say about such credence and why it judges credence 0.6 in X 0.4 in $\neg X$ to be better (draw a picture to explain that)?

Based on classes 6 and 7

- Describe differences between conditional and unconditional credences. Why ordered pairs matter for conditional credences?
- Write down a ratio formula. What is important about it (what does it connect)?
- Suppose that I say that the ratio formula defines conditional probabilities. Describe at least one problematic issue with that statement.
- Dutch
- Write down the conditionalisation rules (both diachronic and for planned conditionalisation). Compare both rules. Explain what it means for conditionalisation to be diachronic.
- Explain two steps in conditionalisation. Solve the following example stating all the steps and computations explicitly.

Suppose I roll two fair dice. Suppose that your initial credences in the sum x of two numbers from the dice roll, $c(\text{sum} = x)$, are as follows (we will only care for the sum between 2 and 7):

$$c(\text{sum} = 2) = 1/36,$$

$$c(\text{sum} = 3) = 2/36,$$

$$c(\text{sum} = 4) = 3/36,$$

$$c(\text{sum} = 5) = 4/36,$$

$$c(\text{sum} = 6) = 5/36,$$

$$c(\text{sum} = 7) = 6/36.$$

- I tell you that the total sum is between 2 and 5 (including both values). Update your initial credence by conditionalisation on this information (show all your reasoning step by step).
 - I tell you that the total sum is an even number. Update your newly updated credences from (a) by conditionalisation on this information (show all your reasoning step by step).
- Explain and possibly prove what it means for conditionalisation to be commutative (explain all your steps).
 - Explain and possibly prove what it means for conditionalisation to be cumulative (explain all your steps).

9. Show and explain (see also slides from the class 7):
 - (a) Show that when you conditionalise, you learn with certainty. Explain what it means.
 - (b) Show that conditionalisation retains certainties. Explain what it means.
 - (c) Show and explain what happen when you learn tautology (the always true proposition).
10. Explain (do **not** construct) the idea behind the Dutch Strategy for conditionalisation. Why do we call it Dutch Strategy rather than Dutch Book?
11. What is the tension between Dutch Book strategy and the requirement that the bookie needs to have the same amount of information as the agent? How does the the planning interpretation of Conditionalisation solves that problem?

Based on class 7

1. Explain why losing information (e.g. forgetting) is problem for conditionalisation. Show your reasoning on a concrete example.
2. Explain why does the example of two paths to Shangri La strengthen the Spaghetti example.
3. Explain what centred possible worlds are. Give an example of a centred proposition. Explain why non-centred possible worlds are not good enough to model centred propositions.
4. Why learning centred propositions is problematic for conditionalisation. Give a concrete example.
5. Describe steps in HTM approach. How does it differ from classical conditionalisation. Why is HTM updating underspecified?
6. Imagine the following scenario:

You wake up in an unfamiliar room. You don't know what happened and who you are. But you know that you are either in a world where you have been kidnapped, had an accident, or just fell asleep terribly drunk at a friend's place and slept there. You initial credences in those options are 0.2, 0.4, and 0.4 respectively. In each world, you are either a secret agent, a murderer, or a student. After looking around a bit, you can also see on the wall written 'Gotham General Hospital'. You also realize that you cannot mover because your hands and legs are tight to the bed.

What are uncentred worlds and what are their centres? How do you update on who you are when you learn that you are in hospital and cannot move? Provide step by step results and explain your steps.

7. What does regularity principle say? What are its consequences for assigning credences to tautology, contradiction and a logically contingent proposition. Briefly explain what a logically contingent proposition is.
8. What is the motivation behind the Regularity principle?
9. Describe the idea behind Jeffrey conditionalisation and its motivation (compare it with classical conditionalisation). Describe when and show formally how Jeffrey conditionalisation reduces to classical conditionalisation.
10. What does Rigidity say (related to Jeffrey conditionalisation).
11. Explain why Rigidity has to hold. What happens if it does not hold and why is it a problem for Jeffrey conditionalisation?
12. Imagine the following scenario

You are a patrolling police officer. Your colleagues reports that a bank robber is speeding in your general direction. The robber is driving either Skoda, Audi, or Peugeot with probabilities 0.3, 0.5, 0.2 respectively. You take these probabilities as your initial credences: $c_1(\textit{Skoda})$, $c_1(\textit{Audi})$, and $c_1(\textit{Peugeot})$. There might be other cars speeding in the area. Your conditional probabilities that you see the robber given that you see a speeding car are: $c_1(\textit{robber}|\textit{speeding Skoda}) = 0.5$, $c_1(\textit{robber}|\textit{speeding Audi}) = 0.6$, and $c_1(\textit{robber}|\textit{speeding Peugeot}) = 0.8$.

After a moment you see a speeding car from your position, but it was too fast to notice the brand properly. After this visual experience, you update your initial unconditional credences $c_2(\textit{Skoda}) = 0.6$, $c_2(\textit{Audi}) = 0.1$, and $c_2(\textit{Peugeot}) = 0.3$.

What is your unconditional credence $c_2(\textit{speeding})$ that it was the robber you saw speeding? What would happen if you learned the brand of the speeding car with certainty?

13. Show that Jeffrey conditionalisation is not commutative. Explain what it means.