

## Problem set 1: 18/9 - Mijntje Soeters

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1a)

P1: If people can freely choose their actions, then they have free will.

P2: People can freely choose their actions.

C: Therefore, people have free will.

= **Logically valid.**

b)

P1: Minnie is a cow,

P2: and she likes to watch the sunset.

C: Therefore, some cows like to watch the sunset.

= **NOT Logically valid.**

c)

P1: because he just came back from holiday in Spain.

C: Roger has a tan

= **NOT Logically valid.**

d)

P1: Every act of murder is a crime.

P2: Some crimes are morally wrong.

C: Therefore, some acts of murder are morally wrong.

= **NOT Logically valid.**

e)

P1: For the murderer is either the man with the hat or the woman in blue.

P2: But the man with the hat is definitely not the murderer.

C: The woman in blue is the murderer.

= **Logically valid.**

f)

P1: There are salmon here,

C: so there are fish here.

= **NOT Logically valid.**

g)

P1: Everyone who likes music either likes Taylor Swift or Kendrick Lamar.

P2: I don't like Taylor Swift, and I don't like Kendrick Lamar either.

P3: But I like the Beatles,

P4: and everyone who likes the Beatles likes music.

C: Therefore, fairies are real.

= **Logically valid.**

2)

P1: If today is a Sunday and not a holiday, Einar is either sleeping in or playing football with his friends.

P2: It's not a holiday today.

P3: Einar only plays football when the weather's nice.

P4: Today it's raining,

P5: and if it is raining today it also rained yesterday.

P6: But Einar only sleeps in if he went out the previous day.

P7: For if it rained yesterday, then Einar surely didn't go out yesterday.

C: Therefore, today is not a Sunday.

3a)

P1: The temperature of the water is 100 °C.

C: Therefore, the water is boiling.

= **NOT Logically valid.**

→ P2: Water boils at 100 °C.

b)

P1: If Tamal is not an only child, she has a brother.

P2: Tamal is not an only child.

C: Therefore, she either has a brother or she is an only child.

= **Logically valid.**

c)

P1: Since I don't hate romantic comedies,

C: I like romantic comedies.

= **NOT Logically valid.**

→ P: If I don't hate romantic comedies, then I like romantic comedies.

d)

P1: The state should respect international law.

C: Therefore, international law should be respected by the state.

= **Logically Valid.**

4a)

C: Therefore, it is not the case that the water is boiling.

b)

The temperature of the water is 100 °C.

Negation of C: Therefore, it is not the case that the water is boiling.

= **consistent.**

c)

B:

If Tamal is not an only child, she has a brother.

Tamal is not an only child.

Negation of C: Therefore, it is not the case that she either has a brother or she is an only child.

= **inconsistent**.

c:

Since I don't hate romantic comedies,

Negation of C: It is not the case that I like romantic comedies.

= **consistent**.

d:

The state should respect international law.

Negation of C: Therefore, it is not the case that international law should be respected by the state.

= **inconsistent**.

What do I notice?:

- There is a link between logical validity and consistency. The logically valid arguments become inconsistent after negating the conclusion. And the other way round too.

**5a)**

Subject-specific: dish, pasta, Italian, salsa.

Logical terms: Not, every, but, if, then.

b)

Dish: a glass jar

Pasta: any type of fruit

Italian: jam

Salsa: strawberry jam

c)

It is **NOT logically true**: According to Characterisation 1.9 a sentence is logically true if and only if it is true under any interpretation. We just assigned an interpretation to the subject-specific terms that made the sentence false, therefore it is not logically true.

**6)**

This is a: contradiction.

→ 'pink elephants are not all pink'. = logically equivalent.

(Some pink elephants are not pink, therefore, pink elephants are not all pink.)