

Lab Assignment #26

This lab is due at 10:15 AM on Wednesday, 12/18, and is worth 10 points. This part may be done individually, or in a group of 2, 3, or 4 people.

1) Airplanes on South-southeast Airlines have 4 seats in each row, with a center aisle. So every seat is either a window seat or an aisle seat.

Consider this statement:

"A passenger on South-southeast Airlines has a window seat if and only if they do not have an aisle seat."

- a) Write this as two if-then statements connected by an "and".
- b) Discuss the truth of the two if-then statements.
- c) Is the biconditional true or false?

2) Airplanes on Southwest Airlines have 6 seats in each row, with a center aisle. So there are window seats, aisle seats, and the dreaded middle seats.

Consider this statement:

"A passenger on Southwest Airlines has a window seat if and only if they do not have an aisle seat."

- a) Write this as two if-then statements connected by an "and".
- b) Discuss the truth of the two if-then statements.
- c) Is the biconditional true or false?

3) Make up your own example of logical reasoning by transitivity.

4) Make up your own example of logical reasoning by disjunctive syllogism.

5) Make up your own example of logical reasoning by contrapositive.

6) Make up your own example of logical reasoning by law of detachment.

7) Consider this argument. Determine if it is valid or not. Justify your answer. Remember, it doesn't matter if the premises are true; we are concerned with whether the premises are enough to prove the conclusion.

If the garbage truck comes, your garbage can will be emptied.

Your garbage can got emptied.

Therefore, the garbage truck came.

8) Consider this argument. Determine if it is valid or not. Justify your answer. Remember, it doesn't matter if the premises are true; we are concerned with whether the premises are enough to prove the conclusion.

If you leave the cooked turkey gizzards in the fridge for a week, they will go bad.

The cooked turkey gizzards have been in the fridge for a week.

They are now bad.

9) Consider this argument. Determine if it is valid or not. Justify your answer. Remember, it doesn't matter if the premises are true; we are concerned with whether the premises are enough to prove the conclusion.

If you set three different alarms for 4 AM, then you will wake up at 4 AM.

You do not set three different alarms for 4 AM.

Therefore, you do not wake up at 4 AM.

10) Consider this argument. Determine if it is valid or not. Justify your answer. Remember, it doesn't matter if the premises are true; we are concerned with whether the premises are enough to prove the conclusion.

If you swing and miss, then it is a strike.

It is not a strike.

Therefore, you did not swing and miss.

11) Consider this argument. Determine if it is valid or not. Justify your answer. Remember, it doesn't matter if the premises are true; we are concerned with whether the premises are enough to prove the conclusion.

You did not swing and miss.

You swung.

Therefore, you missed.

12) Consider this argument. Determine if it is valid or not. Justify your answer. Remember, it doesn't matter if the premises are true; we are concerned with whether the premises are enough to prove the conclusion.

That bird you just saw was a penguin or an auk.

Auks have been extinct for hundreds of years.

Therefore, you saw a penguin.

13a) Bonus question. True or false: If a shape is a square, then it is a rectangle.

13b) Bonus question. True or false: If a shape is a rectangle, then it is a square.