Philosophy 57 — Day 16

- Mid-Term Solutions Posted Online (discuss today)

- Mid-Term Curve to be Posted Thursday

- Quiz #4 Today (Translation: Sections 4.7 and 5.1)

- Today: More on Chapter 5 (Section 5.2)

  - Review of Terminology

  - 3-Circle Venn Diagram Technique & Problems

  - I will be skipping sections 5.3, 5.6, and 5.7

Chapter 5: Categorical Syllogisms Review I

- A Categorical Syllogism is an argument in categorical logic which contains exactly two premises and three terms. Here's a simple example:

  All soldiers are patriots. (All S are P.)

  No traitors are patriots. (No T are P.)

  Therefore, no traitors are soldiers. (No T are S.)

- The three terms in a categorical syllogism (CS) each have names:
  * The major term is the predicate term of the CS's conclusion.
  * The minor term is the subject term of the CS's conclusion.
  * The middle term is the remaining term in the CS.

- In our simple example above, which are the major, minor, middle terms?

- The premises in a CS also have names (which are which in our example?):
  * The major premise is the premise containing the major term.
  * The minor premise is the premise containing the minor term.

Chapter 5: Categorical Syllogisms Review II

- A categorical syllogism said to be in standard form iff:

  1. All three statements are standard-form categorical propositions.

  2. The two occurrences of each term are identical.

  3. Each term is used in the same sense throughout the argument.

  4. Order: major premise first, minor premise second, conclusion third.

- The following syllogisms are *not* in standard form (why?):

Anyone who led America into the space age will live in history. John Glenn led America into the space age. Therefore, John Glenn will live in history.	All P are non-W. Some E are W. Therefore, Some non-P are not non-E.
No men are pregnant animals. All human beings are men. $\therefore$ No human beings are pregnant animals.	All W are P. Some W are M. Therefore, Some P are M.

Chapter 5: Categorical Syllogisms Review III

- The mood of a categorical syllogism consists of the letter names of the categorical propositions that make it up (in order, *e.g.*, **EAI**).

- The figure of a categorical syllogism is determined by the location of the two occurrences of the middle term in the premises. Four possible arrangements:

Figure 1	Figure 2	Figure 3	Figure 4
M P	P M	M P	P M
S M	S M	M S	M S
$\therefore S$ P	$\therefore S$ P	$\therefore S$ P	$\therefore S$ P

- There are exactly 15 valid categorical syllogisms (out of 256 total forms):

Figure 1	Figure 2	Figure 3	Figure 4
AAA	**EAE**	**IAI**	**AEE**
EAE	**AEE**	**AII**	**IAI**
AII	**EIO**	**OAO**	**EIO**
EIO	**AOO**	**EIO**	

Chapter 5: Categorical Syllogisms & Venn Diagrams I

- Four Examples (see next two slides for final diagrams & answers):

    (1) If a person is a republican, then that person is not a democrat. Therefore, all big spenders are not Republicans, since all big spenders are democrats.

    (2) Some latchkey children are not kids who can stay out of trouble, for some youngsters prone to boredom are latchkey children, and no kids who can stay out of trouble are youngsters prone to boredom.

    (3) Some individuals prone to violence are are not men who treat others humanely. Some police officers are individuals prone to violence. Therefore, some police officers are not men who treat others humanely.

    (4) No M are P. All M are S. Therefore, Some S are not P.

    * Step 1: Translate from English passage into three categorical claims.
    * Step 2: Symbolize, and place categorical syllogism in standard form.
    * Step 3: Draw Venn Diagram for premises of Categorical Syllogism.
    * Step 4: Is conclusion information contained in the premise diagram?
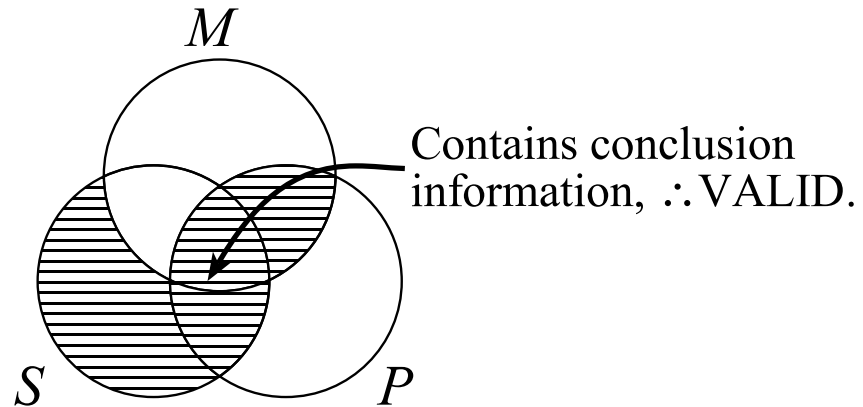
Syllogism in standard form   Venn Diagram of Premises

M

(1)
No P are M.
All S are M.
∴ No S are P.

Contains conclusion
information, ∴ VALID.

S P

Mood–Figure: **EAE**–2

Syllogism in standard form   Venn Diagram of Premises

M

(2)
No P are M.
Some M are S.
∴ Some S are not P.

Contains conclusion
information, ∴ VALID.

X

S P
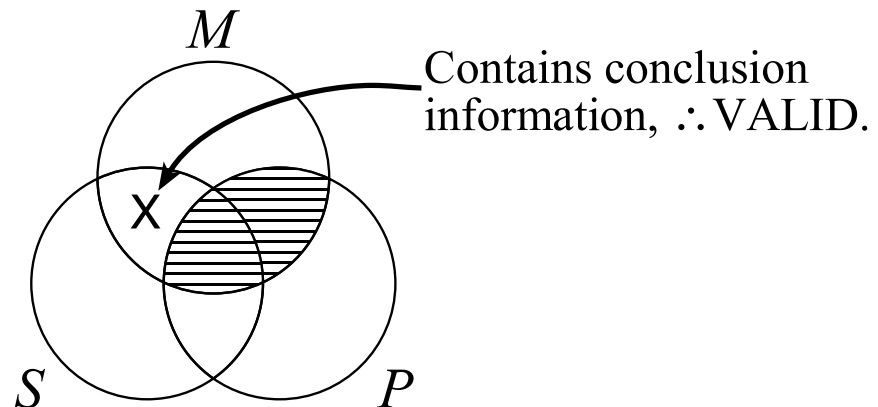
Mood–Figure: **EIO**–4

Syllogism in standard form   Venn Diagram of Premises

$$(3) \quad \frac{\begin{array}{l} \text{Some } M \text{ are not } P. \\ \text{Some } S \text{ are } M. \end{array}}{\therefore \text{ Some } S \text{ are not } P.}$$
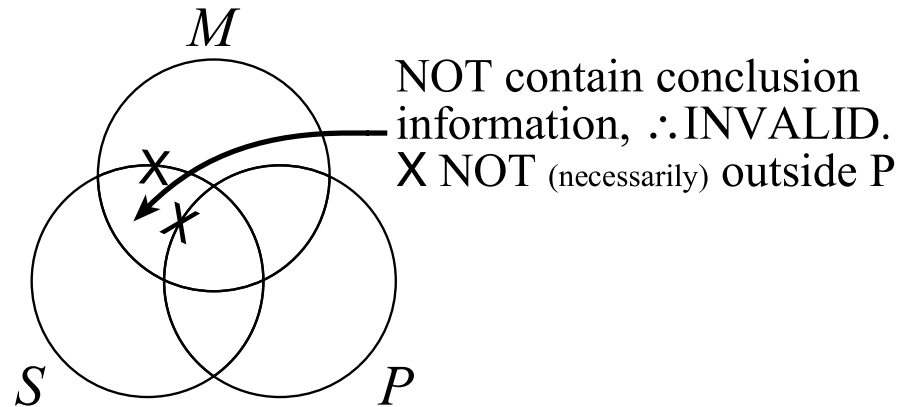
NOT contain conclusion
information, ∴INVALID.
X NOT (necessarily) outside P

Mood–Figure: **OIO**–1

Syllogism in standard form   Venn Diagram of Premises

$$(4) \quad \frac{\begin{array}{l} \text{No } M \text{ are } P. \\ \text{All } M \text{ are } S. \end{array}}{\therefore \text{ Some } S \text{ are not } P.}$$

NOT contain conclusion
information, ∴INVALID.
NO X here at all!

Mood–Figure: **EAO**–3
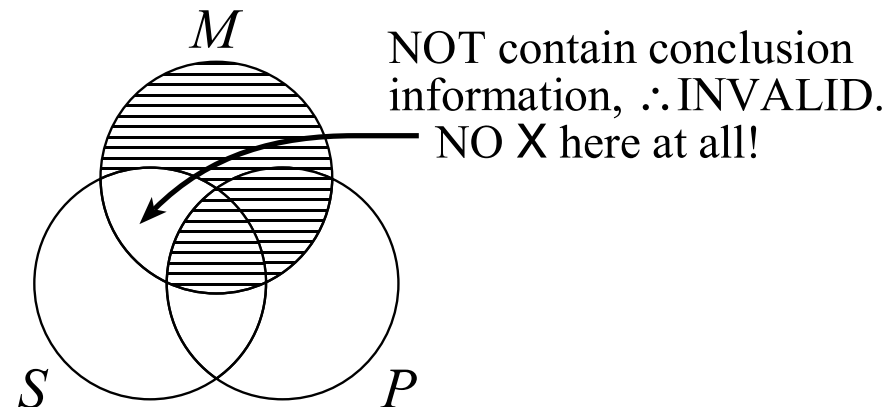
Chapter 5: Categorical Syllogisms *&* Venn Diagrams II

- Four More Examples (see next two slides for diagrams *&* answers):

  (5) A few communications satellites are rocket-launched failures. The only communications satellites are devices with antennas. Therefore, there are rocket-launched failures which are devices with antennas.

  (6) No *C* are *O*.

   Some *D* are not *O*.

   Therefore, Some *D* are not *C*.

  (7) Not all snowflakes are uniform solids.

   Only six-pointed crystals are snowflakes.

   Therefore, some six-pointed crystals are not uniform solids.

  (8) No *P* are *M*.

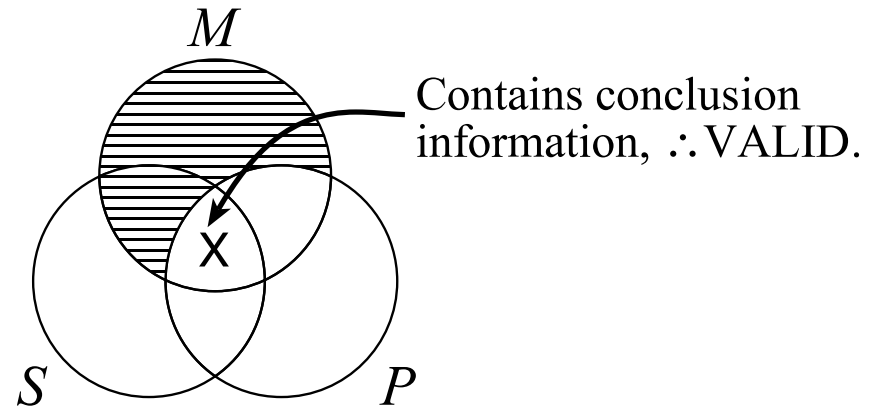   Some *M* are not *S*.

   Therefore, Some *S* are not *P*.

Syllogism in standard form   Venn Diagram of Premises

$$\text{(5)} \quad \begin{array}{l} \text{All } M \text{ are } P. \\ \underline{\text{Some } M \text{ are } S.} \\ \therefore \text{ Some } S \text{ are } P. \end{array}$$

M

Contains conclusion
information, ∴ VALID.

X

Mood–Figure: **AII**–3   *S*   *P*

Syllogism in standard form   Venn Diagram of Premises

$$\text{(6)} \quad \begin{array}{l} \text{No } C \text{ are } O. \\ \underline{\text{Some } D \text{ are not } O.} \\ \therefore \text{ Some } D \text{ are not } C. \end{array}$$
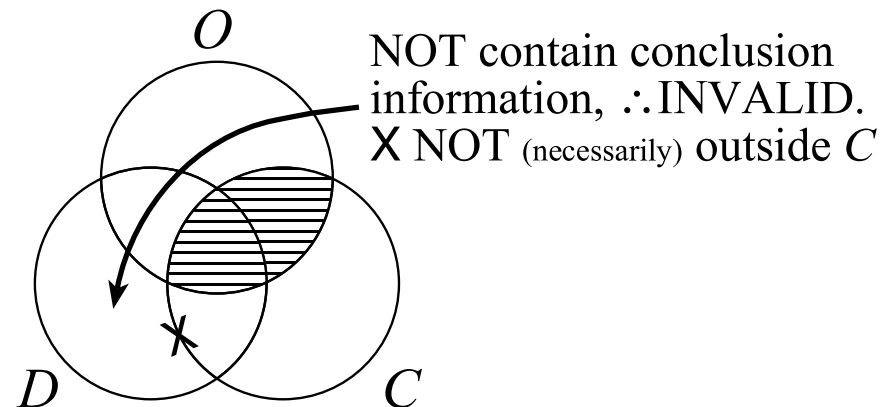
O

NOT contain conclusion
information, ∴ INVALID.
X NOT (necessarily) outside *C*

X

Mood–Figure: **EOO**–2   *D*   *C*

Syllogism in standard form   Venn Diagram of Premises

M

(7) $\dfrac{\begin{array}{l}\text{Some } M \text{ are not } P.\\ \text{All } M \text{ are } S.\end{array}}{\therefore \text{ Some } S \text{ are not } P.}$

Contains conclusion
information, $\therefore$ VALID.

X

Mood–Figure: **OAO**–3 S P

Syllogism in standard form   Venn Diagram of Premises

M

(8) $\dfrac{\begin{array}{l}\text{No } P \text{ are } M.\\ \text{Some } M \text{ are not } S.\end{array}}{\therefore \text{ Some } S \text{ are not } P.}$

NOT contain conclusion
information, $\therefore$ INVALID.
X NOT inside S

X
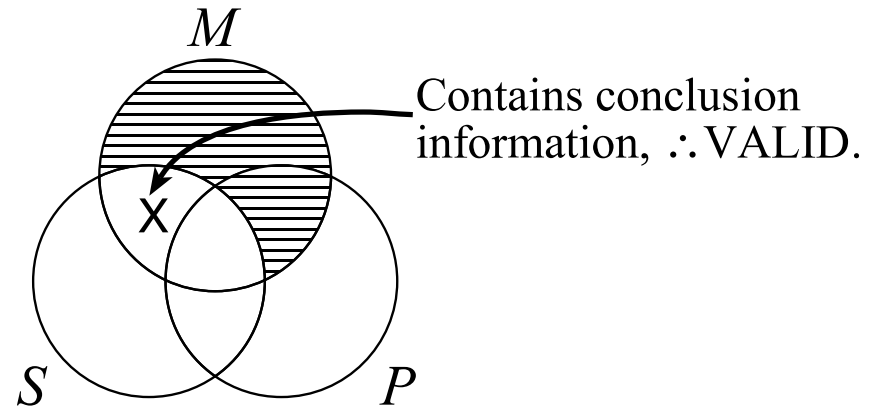
Mood–Figure: **EOO**–4 S P
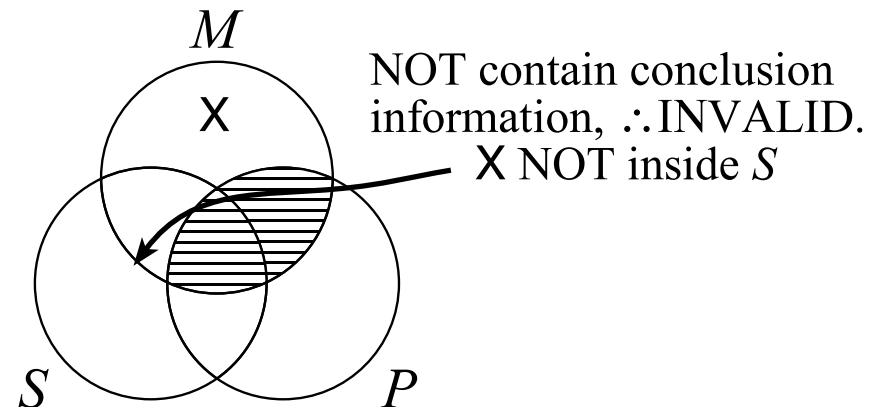
Chapter 5: Categorical Syllogisms *&* Venn Diagrams III

- 3-Circle Venn Diagram Rules and Tips

  1. Marks (shading, or placing an "X") are entered only for the premises. No marks are made for the conclusion.

  2. If the argument contains one universal premise, then this premise should be entered first in the diagram. If there are two universal premises, either one can be done first.

  3. When entering the information contained in a premise, one should concentrate on the circles corresponding to the two terms in the statement. While the third circle cannot be ignored altogether, it should be given only minimal attention.

  4. When inspecting a completed diagram to see whether it supports a particular conclusion, one should remember that particular statements assert two things: "Some S are P" means "At least one S exists and that S is a P.

  5. When shading a region, one must be careful to shade *all* of the area in question.

  6. The region in which an "X" goes is initially always divided up into two parts. If one of these parts has been shaded, then the "X" goes in the other part of the region.

7. If neither of the two parts in a region is shaded, then the 'X' goes on the line separating the two parts of the region.

Right | **Wrong**

or