

INTRODUCTION TO LOGIC

General Introduction

Set by MEQUANINT

What is philosophy?

❖ is the combination of **two Greek** words

➤ **Philo** means **love**

➤ **Sophia** means **Wisdom**

❖ So etymologically philosophy could be understood as **love of wisdom.**

❖ It is open ended(**endless**)

Working Definition of philosophy

- ❑ Philosophy is an attempt to think **rationally** and **critically** about the fundamental questions of life, Like questions **of Reality.**

**Knowledge
Values**

Arguments/reasoning.

- ❑ A general outlook of the world that raises basic questions life.
- ❑ Is the **mother of all other sciences.**

Philosophy

Metaphysics

Epistemology

Aesthetics

Logic

Ethics

Reality

Knowledge

Artistic Values

Arguments / Reasoning

Moral Values

Deductive Reasoning

Inductive Reasoning

1, Meta physics (ontology)

- ❑ Proponents are **Plato** and **Aristotle**.
- ❑ Literally mean **beyond /after physics** from the name of physics book said to be **“tametaphysikabibilia”** which was used as reference book for physics students.
- ❑ is the **study of reality**.
- ❑ Concerned on issues like the sources of the universe?
- ❑ What is reality?
- ❑ Is reality one or many?
- ❑ Here we have **monoists** and **dualists** That believed that reality is one and many respectively.

□ About the sources of the universe ,in ancient period **myth** was considered to be the ultimate sources of the universe, later **fire** then latter in the **6th CBC**, it was supposed that water is the chief sources of the universe .

□ Idealism and materialism are the **two metaphysical position.**

I. Idealism

□ It is **mind plus its ideas** which is **real** or responsible about the existence of matter

□ Ideas **precedes matter.**

□ Ideas exist prior to matter.

□ Mostly it is a **religious outlook..**

A. Subjective Idealism

- ❑ Things do not have independent existence out of perception.
- ❑ Objects can't exist without perception /perceiver.
- ❑ **No perception no existence.**

Fore example:

lets see the idea of G.Berklay

“Esse esti percipi”(latine word) meaning
“To be is to be perceived”

B. Objective Idealism

- ❑ Things have independent existence i.e. **apart from perception.**
- ❑ Existence is regardless of perception.
- ❑ Perception **has nothing to do with existence.**

II. Materialism

- ❑ It is **matter plus its motions which is real**
- ❑ Matter **precedes** ideas
- ❑ Matter cannot be **created or destroyed.**
- ❑ Aristotle, in metaphysical position, **is materialist** that he argued that from the very beginning there was formless matter(**choas**)latter the **unmoved mover and uncaused cause** gives shape for the formless matter .

2. Epistemology

- Founded by **Xenophanes**.
- From two Greek words
 - ‘Epistimo’ means **Knowledge**
 - ‘logy’ means **study**
- Literally it means the **study of theories of knowledge**.
- What is knowledge?
- What is the difference between knowledge and belief?
- How do we acquire knowledge?

- Based on the aforementioned questions we have three theories of knowledge.

A. Empiricism

- Proponents are **Aristotle, Thomas Hobe and John Locke**
- Knowledge is acquired through **sense experiences**
- **Posterior** meaning **after sense experience**
- Mind at beginning is like “**Tabularasa**” latine word to mean **white sheet of paper/blank sheet of paper.**

B. Rationalism

- Proponents are **Rene Descartes, Plato, Socrates'**
- **Reason** is a source of knowledge
- Believed that ideas are **innate**
- They are said to be **prereori**
- Soul knows every thing before she enters the flesh body of an individual (Plato).
- Soul recollects the forgotten idea since it knows every thing before.
- Death is the liberation of soul (socratus)

C. Skepticism

- **Doubtful**
- it is difficult to acquire Knowledge either through sense experience or reason.

3. Aesthetics

- ❖ Proponents are **Plato , Aristotle and Immanuel Kant**
- ❖ concerned with **artistic values** like beauty ,art, music, love etc
- ❖ Is a philosophy **of what people like, look at ,hear ,smell,taste,feel,and why they prefer these things than others.**
- ❖ Raises questions what is love?
- ❖ The relation ship between art and beauty?

4.Ethics

- Comes from Greek word “**ethos**” w/h means

Behavior, character ,regulation

- Is concerned on **moral values /Morality**
- **An in depth thinking** and **questioning** moral principles.
- An area of study w/h attempts to raise **fundamental moral questions** and tries to provide logical and meaningful answers to them.

5. Logic (Reasoning Skill)

- **Xenocrates** is the founder of logic.
- Aristotle is the **father of logic** .
- Xenocratus is the founder b/c he is the first person who tried to base his position based on evidences.
- Aristotle is the father b/c he **devised systematic techniques and methods of evaluating arguments** for the first time.

Comes from a Greek word

- ❖ **logos** which means
 - offering reason
 - thought / evidence
 - Coming up with principle or law

Traditionally logic was understood as follows:

Fore example:

If an individual said that my point of view is logically correct ,it mean as follows.

- ✓ The idea forwarded is based on rational grounds
i.e. he is **reasonable**.
- ✓ The assertion made is **provable/justifiable**.
- ✓ The idea is forwarded with **sufficient ,acceptable and relevant evidences**.
- ✓ The idea offered is believable,
acceptable/persuasive
- ✓ He presented his view point in the way that he makes his audiences to believe that **he is correct**.

- A branch of philosophy that **evaluates an argument.**
- A science that **evaluates an argument.**
- Is a study of **methods** and **principles** used to distinguish good(correct)from bad (incorrect) reasoning.
- Is concerned with the **formulation of principle of right reasoning .**
- Is a **tool** that philosophers employ **to investigate the other branches of philosophy**

Laws of Logic

- There are three **laws of logic**.
- These laws are **crucial** or the **base** for correct reasoning/logical thinking.
- With out these laws logical thinking is impossible.

A:Law of Non- Contradiction.

Advocates “Nothing can both be and not be at the same time and at the same situation”.

E.g., **x** could not be both **x or not x** at the same time and at the same situation”

B:Laws of Excluded Middle

❖ “Something is either is or is not”.

Eg, **x is either x or not x**, regardless of the time and situation it occurs.

C:Laws of Identity

❖ “some thing is **what it is**”

E.g, A is A.

❖ Plato argued that a chalk is a chalk, because, its form makes tableness.

Aims of Logic

- ❖ To know criterias of evaluating arguments.
- ❖ To establish our own (valid and strong)**blameless** arguments.
- ❖ To be an **influential person** upon social, economic ,political and

- ❖ To develop skill and confidence to evaluate the argument of others and to setup our own persuasive arguments/logical speech.
- ❖ To be **praised** and **respected**.
- ❖ To get the **positive mobility of people** on your side.
- ❖ To get **majority support** and **transform one self** into position of leadership.
- ❖ **To persuade/convince others reasonably** than other methods such as intimidation, fear and emotions ,so as to accept and run our position.
- ❖ To develop **reasonableness/ improve quality of reasoning**.

- ❖ Logic do not teach us how to think but rather **to think correctly.**
- ❖ To **avoid fallacious expressions.**
- ❖ Logic honest our mind.
- ❖ To develop **carefulness in expressing our arguments.**
- ❖ It helps us to ride ourselves from being passionate and develop reasonableness.
- ❖ It furnishes us standards to evaluate and develop criticisms against the arguments of others.
- ❖ Logic raises the level of thinking in all aspects of our selves.

Argument

➤ The word argument in English language refers.

- Quarrels
- Bitter controversy
- Squabbles
- disagreement.
- Mere verbal fight.

❖ All these meanings of the term “argument” do not refer its correct usage in logic .

cont....

- ✓ An attempt to show some thing is true by providing reason.
- ✓ Giving reason for or against some claim.
- ✓ a group of statements, one or more of which (the premise) are claimed to provide support (reason) to the conclusion.

E.X, All this class students are female.

Alemu is a member of this class.

So, he is a female

Cont...

- ❖ **Statement:** sentence that is either True or False, but not both one and at the same time.
 - ❖ used to **assert** or **deny** something and evaluated as True or False.
 - ❖ Statements have two possible truth values: true or false
- Ex,** New York is a city in USA
 Ato Meles is the P.M of Ethiopia.

cont.....

Non-statement expressions

❖ Unlike statements, many sentences can not be said to be either true or false.

1. Question- How old are you?

2. proposals: Let's go to the party today.

3. Suggestion: you would rather go by Airplane.

4. Command: stand up!

5. Exclamations: Very good ;
 Right on ;

cont...

- ❑ **Premise:** a statement that provides, reason or evidence.
- ❑ An assumption or claim provided by the arguer as evidence or information.
- ❑ Premise of an argument can be one or more than one statement.
- ❑ Claimed to provide evidence.

cont.....

Conclusion:- is a statement that the evidence is claimed to be supported/implied.

✓ Conclusion : What is claimed to follow from the evidence/premises.

EX, All Ethiopian university students are brilliant.

Gondar university students are Ethiopian university students.

So, they are Brilliant

cont....

- ❑ An argument in which the premises really do support the conclusion are Good arguments.

E.X All uncles are males.

Abdu ,is an uncle

There fore, Abdu is a male

- ❖ the above argument Good argument

cont.....

- When premises do not support the conclusion though they are claimed to the argument is Bad .

E.X. Some Ethiopians are poor
 Alhamudi is an Ethiopian.
 There fore, he is poor.
 is a kind of bad argument.

How we differentiate premises and conclusion in an argument

Based on indicator words

❖ The following are **conclusion indicator words**,

- Therefore
 - hence
- Accordingly
 - so
- We may conclude
 - It follows that
- Hence
 - As a result
- Thus
 - consequently
- It may be that

cont...

- ❑ The following are premise indicator words
 - Since
 - For
 - As
 - Because
 - As indicated by
- Owing to
- Given that
- For the reason that
- Seeing that

Ex. Pregnant mothers should not smoke cigarettes, **since** smoking cigarettes jeopardize the development of the fetus

cont...

- ❑ Some times an argument **may not contain indicators, for both the premise and the conclusion**, when this happen we should answer the following questions effectively.
- ✓ Which statement is clamed to follow from the other
- ✓ What is the arguer trying to prove?
- ✓ What is its main point?

cont....

E.X morally weak persons are not happy. Zinash, who is morally weak, is not happy throughout her life.

➤ How ever through inspecting the aim of the argument we can identified both the premise and the conclusion i.e.

P= morally weak persons are not happy.

C= Zinash , who is morally weak is not happy throughout her life

Non-argument expressions

- ✓ statements lacking inferential claim .
- ✓ they are also known as **unsupported assertions.**
- ✓ Non argument expressions lack inferential claims presented by the arguer as premise or conclusion.
 - Inference $\sqsubset$ the reasoning processes

cont....

An argument is expected to have

- factual Claim .
- Inferential claim.
- There are several forms of non-argument expressions which lacks inferential.
- ❖ Among these the following are notable.

cont....

A. Warnings

- ❖ Are sentences or group of sentences used to give some strong directions.

E.X stop doing so or will throw you out.

B. Piece of advice

- ❖ expressions which used to give guidance counseling for an individual to follow appropriate actions ,procedures etc

E.X , I suggest you that, you shall take logic course in this semester.

cont...

C. Statement of belief/opinion

- ✓ Are expressions of what some one believe in/think at a certain time.

E.X, I believe that all of you will get A grade in logic.

D. Report

- ❖ Is a group of statements that convey information about some situation or event.
- ❖ Journalists present some reports about an event.

E.X, Barack Obama won 2012 US presidential election (Aljezira)

cont.....

E. Illustrations

- ❖ Are forms of exemplifying or clarifying concepts, issues or different subject matters..

E.X mammals are vertebrate animals that nourish their young with milk. For example, cat, dog, cow, and humans are mammals.

- ❖ **N.B We can change illustrations in to an argument.**

E.X you said that no mammal can fly, but that is inaccurate. At least one mammal has wing and can fly. For example Bats are mammals.

cont....

F. Explanations

- A statement intended to **shed light** on some event, situation or phenomena that is accepted as a **matter of Fact**.
- Generally all explanation has **two components**.

These are

A: Explanandum :- is a statement that describes the event to be explained
: is the thing to be explained.

B: Explanans:- are words used to explain the explanandum.

cont.....

EX. Thanks to the favorable condition that the government created for export economy, in 2003 Ethiopian economy increased by 10 percent.

Explanadum:- is in 2003 the Ethiopian economy increased by 10 percent.

Explanans: - thanks to the favorable condition that the government created for export economy in 2003 the Ethiopian economy increased by 10 percent.

cont.....

➤ **N.B** Explanation can be re expressed to form argument

✓ **What happen**-----explanation

✓ **Why/how**-----argument

EX. Light rays from the sun are scattered by particles in the atmosphere. Therefore, the Sky appears blue from the earth's surface.

cont.....

G. conditional statements

- ✓ Are compound sentences of the form
“ **If---then---** “or”
----**If---**
 - ✓ is made up of two components statements.
 - ✓ The statement which comes following the word “if” is called **Antecedent**, and the other statement which comes following the word “**then**” is called the **Consequent**.
- E.X.1 Do not expect “A” from this course, if you do not study hard.

cont...

**Relationship between
conditional statement and
arguments.**

- 1: A single conditional statement by itself is not an argument.
- 2: A conditional statement can serve as either a premise or conclusion (or both) of an argument.

cont.....

3: conditional statement can be re expressed to form an argument.

EX. If both Saturn and Uranus have rings, then Saturn has rings.

Both Saturn and Uranus have rings
there for of Saturn has rings.

4:A conditional statement with other conditional statement can form an argument

cont...

❖ conditional statements expresses the relationship between **sufficient** and **necessary conditions**.

□ 'X' is said to be **a sufficient condition for 'Y'** whenever the occurrence of 'X' is all that is needed for the occurrence of 'Y'.

EX, "If you are stabbed by knife, a scare will appear on your body"

"being stabbed by a knife is a

cont...

- ❖ 'X' is said to be the ***necessary condition*** for 'Y' whenever 'Y' cannot occur without the occurrence of 'X'.

For example, air is ***a necessary condition*** for life.

- ❑ But it is not a sufficient condition since there are other necessary conditions to be full filled in addition to air.

TYPES OF ARGUMENTS

❖ There are **two** types of arguments based on the *connection between premises and conclusion*.

These are : 1. deductive arguments.

2. inductive arguments.

➤ **N.B** Their basic difference is in the ***strength of inferential***

Cont...

A .Deductive argument

- ❑ is an argument in which the conclusion is claimed to follow from premises with ***absolute necessity***.
- ❑ When we present a deductive argument, if our opponents accept our premises, there is ***little likelihood*** for the ***denial*** of the conclusion.

Ex. *All human beings are mortal.*
 Kebede is a human being.
 Therefore, Kebede is Mortal.

Continued

B. Inductive argument

- is an argument in which the conclusion is claimed to follow **only probably** from the premises i.e. the premises support the conclusion with a **degree of probability**.
- The conclusion **does not** follow with **logical necessity** or **certainty from the premises**.

E.X 80 Apples where selected from a basket containing **100** apples, and they were Found to be ripe.

There fore, probably all apples are ripe.

How can we distinguish deductive from inductive Arguments

A. By using indicator words.

All the following are indicators of Deductive argument.

- ❖ *definitely .*
- ❖ *Certainly.*
- ❖ *Necessarily.*
- ❖ *absolutely .*
- ❖ *for sure.*

Ex. *All human beings are mortal.*
Kebede is a human being.
For sure, Kebede is Mortal.

Continued

All these are indicators of **inductive** argument

- **Probably .**
- **Plausibly .**
- **Improbably.**
- **Implausibly.**
- **Likely /unlikely.**

E.X . Last year there was fair rain fall and good harvest in Ethiopia.

This year too, there is fair rain fall.

There fore, **probably** next year there will be a good harvest in Ethiopia.

Continued

B. Based on the Actual strength of the inferential claim.

- If the information or idea contained in the conclusion ***necessarily derived*** from the premises the argument is deductive.
- The conclusion of inductive argument ***doesn't*** follow with ***logical necessity*** or ***certainty*** from the premises.
- In this types of argument we focus on the ***degree of probability***.

continued

C. Based on the form of Argument.

Forms of deductive argument.

A. ARGUMENT BASED ON PURE MATHEMATICS

- In this type of argument the conclusion is depend on some purely **arithmetic or geometric** computation or measurement.
- **statistical arguments** are not deductive since they are based on **probabilistic /sampling** techniques.

EX .Normal body temperature of a healthy person is 37%.

Ms x' s body temperature reached 52%.

There fore, her health condition is not good.

continued

B.ARGUMENT FROM DEFINITIONS

- ❖ The conclusion is claimed to depend merely up on the *definition of some words or phrases* used in the premise.
- ❖ The conclusion already **defines** the truth of the premises.

E.X1. God is **omniscient**. Hence, he knows every thing.

EX2. Mr X is a **bachelor. so**, he is un married.

continued

C. SYLLOGISTIC ARGUMENT

- are arguments consisting of **exactly two** premises and **one** conclusion.
- We can have **three** types of syllogistic arguments, these are:

E.x All FSSH students are clever

All DCES students are under FSSH

So, They are clever

continued

1. Categorical syllogism

- This type of argument is formed by categorical quantifiers such as **all**, **no**, and **some**.

E.X All puppies are dogs.

All dogs are animals that can not fly.

There fore, all puppies are dogs that can not fly.

- ❖ It will be **valid** if it is **universal negative** and **universal affirmative**(**no/all**)
particular affirmative and negative are **always invalid**.

Cont..

- Any categorical syllogistic argument will

Be valid in the form

All A are B

All A are

B

All C are A

OR

All B are

C

so, C are B

All A

are C

➤ Unless it will be invalid

cont..

E.x, All human beings are
mammals

All mammals are animals
So, All human are animals

Or

Ex, All human beings are
mammals

Alemu is a human being

Continued

2. Hypothetical syllogism

- ✓ This argument is formed by or contains a conditional statement

If.....then.....

Or

..... If

E.X If stone scratches glass, and then stone is harder than glass.

Stone scratches glass.

Therefore, stone is harder than glass

- ❖ Hypothetical syllogism is of **two** types.

Continued

A .Mixed Conditional statements

- Mixed conditional statements could be **valid only** in the following form.

1. Modus ponens

- It can be defined as “A mode or means of making conditional statements **positive**.” And it has the following form

If A, then B

A

So, B

Continued

E.X If Einstein was a physicist, then he was a scientist.

Einstein was a physicist.

So, Einstein was a scientist

N.B The order of the premises (statements) can be changed i.e.

“A; if A, then B; so B

E.X Einstein was a physicist.

If Einstein was a physicist, then he was a scientist.

So, Einstein was a scientist

Cont..

B.Modus tollens

- It can be defined as “A mode or means of making conditional statements “**negative**” this argument gets its name from the second premise which **denies** the consequent of the first premise and it has the following form.

Continued

If A, then B
Not B
So, not A .

E.X If it is raining, then the ground becomes wet
The ground is not wet.
So, it is not raining.

N.B Like modus ponens we can change the order or form of the argument like,

Not B; if A, then B; so not A

Continued

B. Pure conditional statements

❖ They will be valid in the following form.

If A then B

if B then C

SO, if A then C

Fallacies in conditional statements

➤ Any argument whether it is deductive or inductive if it becomes fallacious , if it is a deductive argument it is **invalid** and if it is inductive it is **weak** argument.

Continued

1. Denying the antecedent

- ✓ fallacies may appear in modus tollens. They have the following form

If *A*, then *B*

Not A

So, not B

E.X If Abraham Lincoln committed suicide, then he is dead.

Abraham Lincoln did not commit a suicide.

So, Abraham Lincoln is not dead.

Continued

2. Affirming the consequent

- ✓ fallacies may found in modus ponens through having the following form

If **A, then B**

B

So, A

E.X ,If Einstein was a physist, then he was a scientist.

Einstein was a scientist.

So, Einstein was a physist.

Cont....

C . Disjunctive syllogism

This type of arguments are formed by

“Either.....or.....” conjuctor

Ex. Either Bahirdar or Gondar is the capital city of ANRS.

Gondar is not the capital of Amhara.
There fore, Bahirdar is the capital city of ANRS.

Cont..

- ❖ It could be **valid** either of the following manner.
- ❖ Either **A or B**
not A
so B
- ❖ Either **A or B**
not B
so, A

Continued

- ❖ It could be **invalid** in the following form.

Either **A or B**

A

so not B

- ❖ Either **A or B**

B

so not A

Continued

Forms of Inductive arguments

A. Argument From Analogy

- ❖ the **most common** type of inductive argument .
- ❖ is an argument in which **the similarity of two or more things** (entities) in one or More respect is used as the premise and its conclusion is that those entities are similar in **some further respect**.

E.X. Abebe's Toyota has an excellent seat,
agasmilleage and a computer set.

Tesfaye's Toyota has an excellent seat and a
gasmilleage.

so, Probably, Tesfaye's Toyota has a computer set.

Continued

B. Inductive Generalization

- ❖ Is an argument which **proceeds** from the knowledge of **selected samples** to some claim about the **whole group**.

Example:

*There are 100 students who are taking the course introduction to logic. Among these students **10 of them** were selected at random and found to be **intelligent**. Therefore, this shows that **all of these** students are intelligent*

continued

C. Arguments based on Signs

- Is an argument in which the conclusion is depend up on ***placement /displacement of symbols.***

E.X. The packed material says that, “Keep it far from children”.

There fore, this packed material must contain some sort of

medicines

Continued

D. Casual Inference(Causation)

➤ Underlies arguments that proceed from knowledge of **cause to knowledge of an effect or the reverse**.

❖ Expresses **Cause effect** relationship.

E.X. A bottle of wine was accidentally left in the freezer overnight.

There Fore, the bottle of wine had frozen.

E.X. I have tasted a piece of chicken and

Continued

E .**Arguments based on Prediction**

- ❖ The Premises deals with some known event in the **past, present**, and the conclusion moves beyond this event to some event in the **relative future**.

Example:-

It has been raining for the whole day of this week.

This shows that it will rain for the coming week.

Cont...

Validity and Invalidity

- every deductive argument is either **valid** or **invalid**.
- we can evaluate deductive arguments as; **valid, invalid, sound, and unsound**.

Cont..

Valid Deductive Argument

- If the premises **do in fact support** the conclusion the argument is **valid**.
- The validity of an argument can be distinguished from its **conclusion** i.e. if the premise assumed **true**, then it is impossible for the conclusion to be **false**.
- In a valid deductive argument premises and conclusion are so related that it is absolutely impossible for the conclusion **to be true unless the premise is true also**.

T.P # F.C

continued

❖ In these type of argument the conclusion follows from premises **with necessity** i.e. **$T.P = T.C$**

$$\mathbf{F.P = F.C}$$

E.X All mammals are four footed animals.

All cows are mammals.

Therefore, all cows are four-footed animals

continued

- If the premises support or become relevant to the truth of the conclusion then the argument is valid. This is because logical validity depends on the **form of the argument, not on its content.**
- In deductive arguments, when the conclusion follows from the premise or when the premises support the conclusion, the argument is said to **be good or correctly formed** and a correctly formed argument is called

INVALID DEDUCTIVE ARGUMENT

- If the reasoning in a deductive argument **is not** correctly formed i.e. if the premise becomes **irrelevant** or **not supportive** to the conclusion the argument is **invalid**.
- A deductive argument is **always invalid** when the **premise is true and the conclusion is false**

Cont..

- In these types of argument if premises are assumed true it **is possible** for the conclusion **to be false**.

E.X some animals are two footed

human beings are animals

There fore, all peoples are two-footed.

Premises

Conclusion

F

T

T

F

cont,...

Rule

1. There is **no middle ground** between valid and invalid arguments i.e. we can not call a given argument as it is **almost valid or almost invalid**.
2. There is almost **indirect relation** between **validity** and **truth value**.

Cont...

- truth or falsity of premises and conclusion can be illustrated as follows.

<u>Premise</u>	<u>Conclusion</u>	<u>validity.</u>
T	T	either
T	F	Always
Invalid		
F	T	either
F	F	either

A. SOUND ARGUMENT

- ❖ If a deductive argument has **all true premises** and become **valid in reasoning**.
- ❖ a deductive argument is sound if and only if it is valid and have all of its premises are true.

$$\text{S.A} = \text{All T.P} + \text{valid in Reasoning}$$
$$\text{T.P} = \text{T.C}$$

Cont.....

B. UNSOUND ARGUMENT

1. Valid argument but at least has one F.Ps.

2. Invalid with all true premise i.e. it has F.C.

3. It is invalid but at least one false premise.

Cont..

Inductive arguments

- ❖ can be evaluated as strong, weak, cogent and uncogent.
- ❖ the conclusion is claimed to follow from its Premise only with probability but **the degree of probability can be strong or weak.**

A. Strong inductive argument.

8. if the premises are assumed true, it is **probable** for the conclusion to be true

Cont..

E.X.1 This barrel contains 100 oranges.

80 oranges were selected at random and found to be spoilt.

It follows that all the 100 oranges are spoilt.

Strong b/c the degree of probability is high.

Cont...

Weak Inductive argument

- ❖ if the premises are assumed **true it is probable for the conclusion to be false.**
- ❖ has **greater probably** to be **false** and **lesser to be true.**

E.X.1. Slightly less than 50% of Ethiopian are men.
X is an Ethiopian.
Therefore, X is a man.

E.X.2 This barrel contains 100 oranges.

Five oranges selected at random were found to be spoilt.

It follows that that, all the 1000 oranges spoilt.

- ✓ *Weak b/c the **degree of probability is very less.***

Cont..

- N.B Strength and weakness has **an indirect** relation with **truth or falsity**.
- Rather based on the strength of the connection between the premise and the conclusion.

<u>Premise</u>	<u>Conclusion</u>	<u>Strong/weak</u>
T	T	either
T	F	Always Weak
F	T	either
F	F	either

Indicators of weak and strong arguments

weak

less than

Few

Strong

Nearly all
little

All
some

No

Vast majority

Cont..

Cogency and un cogency

Cogent argument

❖ is an inductive argument that is **strong** and have **probably all true Premises**.

C.A = All true premise + Strong

Also called “**good**” inductive argument.

E.X. All American presidents were male.

Therefore, the next American president

Will be a man.

Cont....

Un cogent argument-

- 1.Strong but has at least **one false premise.**
- 2.Weak but with **all true premises.**
- 3.Weak at least **one false premise.**

E.X This barrel contains 100 oranges.

Five oranges selected at random & were found to be spoilt.

It follows that all 100 oranges may be spoilt.