

Introduction of Logic
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Lecture - 03
Types of Arguments: Deductive vs Inductive

In the last few lectures, we talked about what we mean by argument and how to identify an argument. That mean recognizing argument especially when what we have said was these; that whenever you find some kind of indicator words are premises are indicator words for the conclusion. Then we are saying that they seems to be some kind of argument present in a given English language passage. So, identifying or recognizing the argument is the most important thing for a logician. So, once see identifies in argument then we can we can criticize we can evaluate this arguments what type of argument it is etcetera. So, in this lecture, what we would be doing is simply these that once we identified the argument and then once we have distinguished it from non arguments.

Non arguments in the sense that reports warnings piece of advice explanation exposition illustration etcetera. Once you extract from these things one we why once we have an argument, then the immediate question that comes to us these what type of arguments it is. So, usually in logic we study to defined kinds of arguments. So, one is inductive argument another 1 is deductive argument.

So, this lecture we will be focus in our attention on deductive arguments and what are the characteristics of the deductive argument. Where do a come cross deductive arguments in what sense the different from the some other kind of argument which we are talking about, that is the inductive argument. Say in what sense these 2 are different alone in the 1st sense primary think which we need to length in any logic course is the distinction between the deduction and induction.

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The slide is titled "Types of Arguments" and features a sub-section titled "Deductive Arguments". It contains five numbered bullet points:

- 1 In a deductively valid argument, if the premises are true, the conclusion must be true (by logical necessity).
- 2 The link between the premises and the conclusion is **strict**.
- 3 **Indicator Words:** Necessarily, certainly, definitely.
- 4 Successful deductive arguments are those in which the conclusion is completely guaranteed by the premises.
- 5 The conclusion must be contained within the premises. The conclusion cannot go beyond what the premises implicitly assert.

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So, far we have what we have done is like this. So, what we said is that non-inferential passages are non-arguments. Whenever you find some kind of inferential claim in the given passage, then we are saying that some kind of argument is present in the given passage. So, we will straight away move in to the 2 different types of arguments 1 is inductive argument another one is deductive argument.

So, where to be find this inductive and deductive kinds of arguments. So, what is the definition of a deductive argument any argument consist of premises and conclusion. It depends upon how the premises are leading to the conclusion we have these 2 different kinds of arguments. So, in the case of deductive arguments if the premises are true the conclusion has to be true in all.

So, it is by what you of kind of logical necessity the conclusion necessarily follows from the premises. So, that is mean if it is a valid kind of argument which are talk about little bit later. If you say something is a valid argument an all a deductive argument especially when if you have true a premises you cannot have a false conclusion. If you have a false conclusion then that is called as a invalid kind of argument.

So, 1 of the important things which we will observe in the case of deductive argument is these that, a conclusion necessarily follows from the premises is a kind of some kind of logical necessity. So, will the premises a true the conclusion cannot be false in all. So, the link between in the premises and the conclusion in the case of deductive argument is

strict. So that means, if the premises are accepted to be 100 percent true the conclusion also accepted to be 100 percent true and all there is the some kind of absolute.

Certainty involved in deductive kind of arguments. So, how to identify that there are deductive arguments in a English language passage that we are looking for. So, again there will be some indicator words for identifying the deductive arguments especially, when we look at the conclusion part and all in the given argument. So, they end with these kinds of phrases necessarily certainly definitely etcetera and all. So, there is some kind of absolute certainty involved in these kinds of arguments deductive arguments.

So, we find this kind of argument basically in mathematic mathematics etcetera; so mathematics 6 kind of certainty. So, usually we find this kind of arguments in off course in some of the arguments if find it in day to day life. But, to what extent they we will be useful and all we will talk about little bit later. So, if you want to say that a successful deductive argument and these are the arguments in which the conclusion is completely guaranteed by the premises are true.

The premises are true they cannot be false again and again am saying the same thing the conclusion must be contained in the premises and all. So, it is in this sense that deductive argument there is nothing you in the conclusion. So, everything that is was in the conclusion these already there in the premises in what is what is so great about these deductive arguments and all. So, whatever there in the premises, which is implicit which is made explicit in the conclusions.

So, there is nothing know new information which your going to arrive it in the case of deductive argument, because the conclusion is already present in the premises which is which is implicit earlier it will become explicit. So, the case of deductive arguments that is considered example, then will talk about what we what are the characteristic of a deductive argument.

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Example:

Example

All Police chiefs are honest.
Mr. Kapoor is a police chief.
Therefore, Mr. Kapoor is honest.

Note: First premise is taken to be an absolute universal generalization with no exceptions.

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Suppose, if you say that all police chiefs are honest in no that the not are all any honest on, but for time been assuming that all police chiefs a chief of supermen police etcetera an all there on honest assume to be to we have note that in logic need have to be actually true an all assume some of the things to be true then based on your assumption you see whether the conclusion follows from that or not.

So, all the police chief are honest practically speaking suppose if you say that Mr. Kapoor is a police chief, then it must the case that Kapoor has to be honest an all Kapoor can be dishonest based on our assumption that all police chief on his 100 percent true mr Kapoor is a police chief is certainly true; that means, absolutely true an 100 percent true.

Then it cannot go in any other way when is that Mr. Kapoor has to be honest must be honest the 1st premise is take can to be an absolute universal generalization without any exception and all. So, in the deductive arguments suppose if you begins with all police chiefs are honest an all are if you say all cross are black etcetera that in the universal generalization which is taken for granted that it is taken for granted that there are no exception an all.

So, it is in this sense the 1st premises 100 percent true 2nd premises is 100 percent true then 3rd premise we cannot say that it is 90 percent true or 50 percent true etcetera, and all it is no element of degree of true in the conclusion, if the except the premises to be

true then the conclusion must be true and all the premises are true the conclusion cannot be false and all if that is the case it is not valid are kind of argument.

It is invalid kind of argument which we are going to talk about little bit later. So, validity tells us what follows what. So, which we will talk about a little bit later when we talk about validity of deductive arguments etc. So, in this example if the 2 premises are assume to be a absolutely true then the conclusion cannot be falls and all that means, you cannot come up with a single counter example in which your premises all police chief are honest Mr. Kapoor is the police chief is true then it cannot be the case at we cannot come off with any counter example in which the Kapoor is honest and all we cannot come a cross any instant where you can show that a Mr. Kapoor dishonest and all. So, premises guaranties that a conclusion is true.

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The slide is titled "Deductive Validity" and contains the following text:

Validity
To say that an argument is deductively valid means that it is **logically impossible** for all the premises to be true and the conclusion false.

The set of three statements should be collectively consistent.

If the premises, taken together, are **inconsistent** with the negation of the conclusion, the argument is deductively valid.

Example
All Police chiefs are honest.
Mr. Kapoor is a police chief.
Therefore, Mr. Kapoor is not honest.

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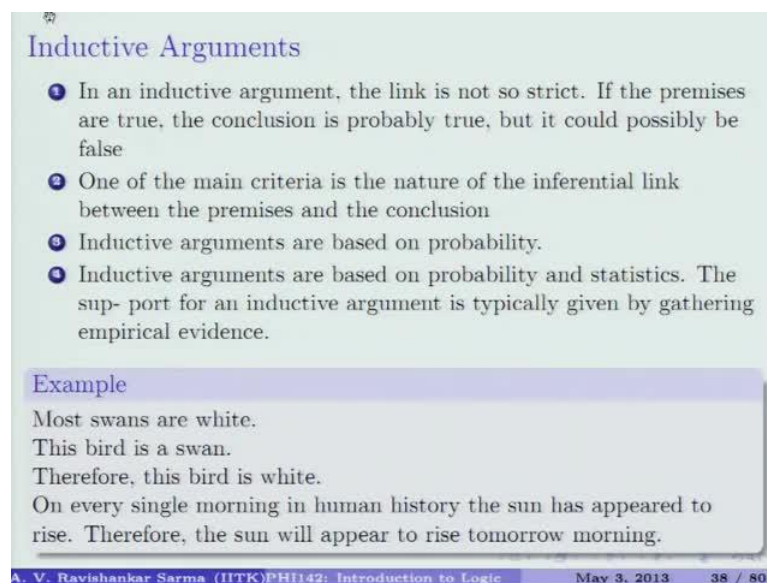
All there is comes some kind of necessity involved in these kinds of arguments and all necessity absolute certainty these are some of the important characteristic of deductive arguments. So, what we mean to say that deductive argument is valid to say that an argument is deductively valid means that it is logically impossible for the premises to be true and the conclusion is false and all if you come across a situation where your premises are true and the conclusion is false then it is automatically an invalid kind of argument. So, the set up 3 statements one of the important requirement is this that the set of 3

statements should be collectively consistent and all consistent in the sense that either you can show that x is the case or $\neg x$ is the case and all.

So, if you can show both are the cases x and $\neg x$ for example, if you obtain if you derive something like it is remaining and it is not then there is something wrong with the argument and all. So, the given premises are inconsistent if the premises taken together are inconsistent with the negation of the conclusion this another way of put in that deductive argument is valid or invalid if the premises taken together are inconsistent with the negation of the conclusion not the conclusion and all the negation of the conclusion then the then also the argument is said to be deductively valid.

So, this is an example which establishes this particular kind of thing all police chief are honest again the same example which will be taking Mr Kapoor is a police chief therefore, Mr Kapoor is not honest suppose if you can come across this kind of conclusion.

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Inductive Arguments

- 1 In an inductive argument, the link is not so strict. If the premises are true, the conclusion is probably true, but it could possibly be false.
- 2 One of the main criteria is the nature of the inferential link between the premises and the conclusion.
- 3 Inductive arguments are based on probability.
- 4 Inductive arguments are based on probability and statistics. The support for an inductive argument is typically given by gathering empirical evidence.

Example

Most swans are white.
This bird is a swan.
Therefore, this bird is white.

On every single morning in human history the sun has appeared to rise. Therefore, the sun will appear to rise tomorrow morning.

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Then it is considered to be an invalid kind of argument will have to be honest if it comes under the category of a police chief. So, then we will talk about where do come across inductive arguments little bit later how to identify this deductive argument is in a given language passage English language passage little bit later, but we will talk about what you mean by inductive arguments. So, there is the 2 different kinds of argument that you come across in in basically you come across in why we will reading

scientific text are reading some kind of news paper are something like that is the commonly occurring kind of arguments which you come across even in day to day discourse also in an inductive argument on the other hand as compared to the deductive argument the link between the premises and the conclusion is not strict i mean said means conclusion can probably follow from the premises along in the inductive arguments conclusion need not necessarily follow from the premises.

So, if the premises are true then the conclusion is only be probably true. So, probability has various connotations and all talk about little bit later when I go in to the details of inductive arguments, but here especially to make these 2 arguments distinct and all on the 1 we have conclusion necessarily follows from the premises there is the known way in which if premises are to be the conclusion is false, if you subscribe to 2 things and we are to you will by to the automatically we will get other 1, we of course we have to by the other 1 also it will be given free of cost.

So, we cannot give up the conclusion and all if your premises are accepted to be true a conclusion has to be must be true and all in the case of deductive and all that is not the case in the case of inductive arguments. So, a conclusion probably follows from the premises and 1 of the criteria is the nature of inferential link between the premises in the conclusion.

That is going to decide whether it is an inductive or deductive argument. So, inductive arguments are based mostly based on probability and inductive arguments are based on statistical data etc and all. So, the support for an inductive arguments is typically given by some kind of empirical evidence are direct observation etc. So, we is an example of an inductive argument and will seen in what sense is inductive argument is different from the deductive arguments, suppose if you say most swans are white and not saying the all swans are white and all basically in our observation and you observe that many close black etc and all. So, you observe 1000s of cross let say if your hobby that in hobby that in observing close is your spot of to day to day activity and all.

So, you observe that all close for blab most of the close are black and all. So, now, we got off in the morning in the new observe that the next clue observe is also he in this case is swan we are talking about swan. So, this bird is a swan and all. So, therefore, this bird has to be white and all most swans are white is bird is a swan then has to be this is

probably white an all. So, it may happen that the bird that a come a cross next bird that we are going to see that is swan may be a black also. So, an every single morning in the human history the sun appear to rise an all therefore, we say that usually we say that sun will also appear to rise tomorrow morning in the eastern. So, based on a repeated observations an all usually we in for that we predicts something and we say that a let us say 1000s of instants.

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Inductive Arguments:

- 1 **Indicator Words:** Probable, likely, reasonable.
- 2 Arguments dealing with statistical data, generalizations from past experience, appeals to signs, evidence or authority, and causal relationships.
- 3 A strong argument is one in which it is probable (but not necessary) that if the premises are true, then the conclusion is true.
- 4 A weak argument is one in which it is not probable that if the premises are true, then the conclusion is true.
- 5 A cogent argument is a strong argument in which all of the premises are true.
- 6 An uncogent argument is either a weak argument or a strong argument with at least one false premise.

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Deduction	Induction
<p>1 Conclusion contains some information that is not in premises</p> <p>(NO)</p> <p>All Men are mortal Jocrates is man ----- Jocrates is mortal</p>	<p>YES</p> <p>Most of the students who graduated from IITK after 2007 took a course on PHI 42 (Intro Logic)</p> <p>Sekhar is a student who graduated after 2007</p> <p>Probably, Sekhar took course in logic</p>

You observed were sun rose in the were rose in the east in the based on that information you will say that sun will also rise the east tomorrow morning also. So, there is know such kind of absolute necessity in all in this kinds of arguments an all. So, before going in to the details of what kind of things are inductive and not kind of things are deductive arguments let me a talk about a distinction between the deductive and inductive argument in an better way. So, so if is the sum the questions that we need to ask our self to judge whether a given argument is a deductive or inductive argument. So, the 1st question we need to ask this is the case of are deduction and the other an we have induction.

So, they are the 2 different kinds of reason that you come a cross in a day to day discuss. So, the 1st thing which a need to note is that whether that a conclusion conclusion contains contains some information conclusion contain some some information that is not in premises that is not in premises. So, now, the 1st question that we need to ask yourself is this that is in the case that the conclusion contains some information that is not in the premises an all. So, depending upon the answer we can say that it is deduction are it is an induction an all.

In the case of deductive arguments the answer is the answer is no and in the case of inductive arguments the answer is yes. So, what it says is this that if you observe the argument a greater detail then what we will see, if you ask this question whether the conclusion contains some information which is some information that is not in the premises then in the case of deductive arguments it is not the case, but in the case of inductive arguments it is a case for example, if you say all when are mortal. So, crates man. So, crates mortal there is absolutely there is no new information in the conclusion. So, crates mortal for example, if you say this is the common example which every one gives all men are mortal.

So, crates is man. So, crates is man something like that then we say that. So, crates is mortal. So, now, observe this kind of argument is a deductive argument and now we need to ask this particular kind of question whether the conclusion contains any new information that is not there in the premises. So, so crates mortal is already hidden in all men are mortal and. So, crates man. So, crates mortal is made express it in the conclusion which is already hidden in the premises an all. So, there are some other things

which come under the category of deductive arguments which usually come a cross in day to day disclose also for example, if you say that somebody is a layer an all.

Ram is a layer an from that we can in for that from always tells lies. So, this by definition that follows from this in ram is a layer layer means details we tells lies. So, argument based on definition are there are some kind of analytical through which come under i mean which we which will talk about in the example in the little bit later, but in this case absolutely there is no new information present in the conclusion an all were as in the case of inductive arguments

For example, we say that most of the itch students who graduated from some most of the students most of the students graduated from itch this institute after let us say 2 1000 7 something i that who graduated after is thing took a course a course on let us some course which is name phi 1 4 2 introduction to logic. So, this is the 1st premise an all. So, we have saying that most of the students. So, so it graduated from itch after 2 1000 7 took this course an all. So, happen incidentally that in a most of the student took this particular kind of course, now let us say some example

Now, the second premises is the 1 student with the name Sekhar is a student of student who graduated to graduated after let us say 2 1000 7. So, the 1st premise is that most of the students of graduated from itch from after 2 1000 7. So, happened that it took is introduction logic course now Sekhar is a student who graduated after 2 1000 7. So, that then you say that probably Sekhar took a course in logic.

So, this is the conclusion which follows from is 2 premises any happy to the case at it is a strong argument conclusion seems to be probably follow from the premises because most of the students of graduated let us say in 90 90 1st of the student who graduated from itch of 2 1000 7 in took the course in logic an all 9 not 19 90 percent of the student in every batch. So, now, say can as graduated let say in to 2 1000 8 are something like that in probably Sekhar also would have taken is particular kind of course, in logic we need to note that a conclusion only probably follows from the premises an all it might be the case that Sekhar might have taking is particular kind of course, we might have not following under the category of most of the students.

, suppose if you convert this argument we reading prepare this argument in a different way for example, if you say that all the student graduated in the itch. After 2 1000 7 took

a course graduated took a course in phi 1 4 2 and it. So, happened that phi 1 4 2 is compulsory are something like that every student must do an all then this argument may turn out to be the case that in a Sekhar also took the took a course an logic an all, but in this case the way this argument is interpreted the conclusion only probably follows from the premises an all.

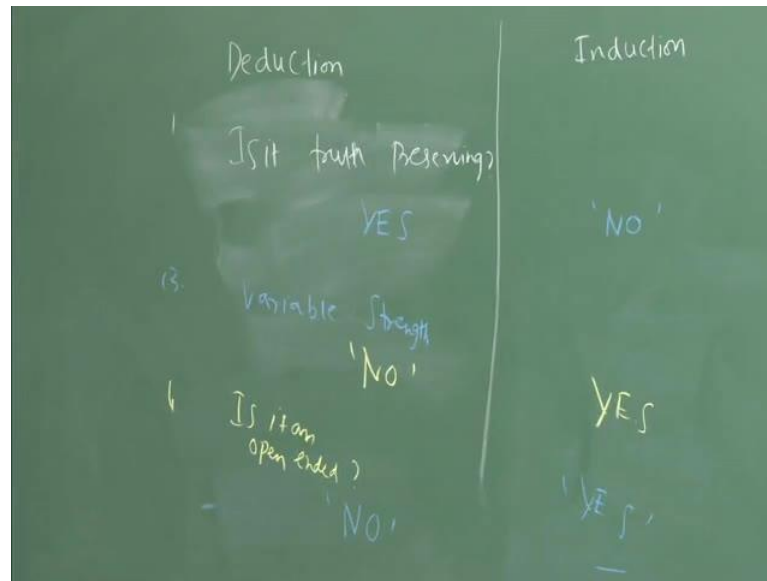
So, now, again come back to this are fun initial question that whether the conclusion contains some information that is not in the premises definitely it is not whether certain kind of information which is not presented in the premises and then what we are trying do is the a conclusion probably Sekhar also took course in logic seems to be going beyond what is stated in the premises an all.

So, the idea here is this that whether are not the conclusion contains some information which is not there in the premises if the answer is no then it is a deductive argument because there is no absolutely there is no new information the conclusion in the case of the inductive arguments a the conclusion contains some information which is not there in the premises an all. So, 1 example another example of an inductive argument could be is that all of us travel in commercial plaits an all in the air india etc all this in to different places then it.

So, happened that in a 199.99 percent certain 100 percent an all 199.99 percent of commercial air line plaits completed have completed without any incident an all its. So, happen that the landed safely an all. So, based on that kind of premise it in infer that the next being that you're going to take from will all will almost certainly arrive safely an all.

So, it is there is no can be that is 100 percent it will land safely an all though information our we have trust in our safety of our public safety etc of plaits etc an all even the you can we cannot 100 we cannot same with 100 percent certainty that the next plait that you're going to take will also lands safety an all it might be the case it an all were is some technical problem are my something might wrong might happen in the engine etc. So, many thinks might happened an all. So, in that case also the conclusion goes be on what is stated in the premises an all is no absolute certainty in holding these kinds of arguments. So, the other important feature that distinguishes inductive and deductive argument is the next question that we to ask is based on whether.

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Your answer is yes or no and that is going to decide whether it is a deduction or induction. So, now, the next question that we need to ask is if your argument truth preserving. So, deductive argument preserve truth one of the definition of valid deductive argument this is that if the premises are true the conclusion cannot be false at all; that means, it is preserving the truth at all. So, if the premises are true the conclusion must be true at all; that means, truth is preserved by the argument at all. So, an example is mortal Socrates is man it is mortal at all we will be guided by this example, but in the classic text book this is the example which we give at all.

So, in that particular kind of example all humans mortal assume to be true. So, criticism of a true then so Socrates must be true at all that is what is called as truth preserving kind of argument. So, the answer for this question is yes, then it is a deductive argument if it is not truth preserving then it is called as inductive argument what it means if in the case of inductive arguments the conclusion only probably follows from the premises; that means, you can come off with any instance where your premises are true, but your conclusion can be probably false at all most of the cases it might happen your observation etc tells at that the next in that going to predict is also true at all, but this no of absolute guaranty that in a conclusion is true at all, but that is the case in the case of argument that you commonly find in the case of field of mathematics etcetera something is true when it is to be absolutely true at all in mathematics we do not say that premises are 90 percent true 70 percent true etc at all once you accept that something is true and that is

absolute true certainty true etc an all. So, these the reason why known if mathematic does not some kind of certainty then other feels we do not have anything to say about other feels. So, mathematic definitely seek some kind of certainty an all. So, this is the kind of ideal kind of situation the ideal which we want achieve day to day. So, the question is whether do we come a cross these kind of argument in day to day discourse are not that we little bit patient we will come to note about these things little bit later. So, truth preserving then the answer is yes in the case of induction the answer is no now the 3rd one is is the argument is having some kind of variable strength.

So, the questions an all answer will be like this in the case of deductive argument it is no and in the case of inductive argument is yes; that means, conclusion is accepted with some degree of truth an all. So, since in the case of inductive arguments conclusion we not necessarily follow fun the premises conclusion only probably follow from the premises then it is having some kind of variable strength an all. So, this is not permitted in the case of deductive deductive arguments conclusion necessarily follows from the premises there is no kind of variable strength which we will come a cross in the case of deductive arguments the answer here is no the answer here is yes an all is a argument is having some kind of variable strength we ask yourself this question, if your answer is no then that is deductive argument.

If you answer is yes then it is an inductive argument and the one of the another final thing which we need to notice this thing is it an open ended argument an all open ended argument an all. So, if your answer is; that means, additional premises we can are strength then the argument open in the sense that in with argument is close then additional premises will not invalid the conclusion at earlier if it is open in that argument then then addition of new premises will weak an a strength in the argument.

So, in the case of deductive arguments the answer is no suppose if you ask you self is the case that your argument is an open ended argument; that means, additional of new premises are a new information weak and strength and the conclusion that your drawn earlier then the answer clear cut answer in the case of deductive argument is no in the case of inductive argument answer is yes so; that means, inductive arguments are open ended kind of arguments. So, this is the mean distinction between the deductive and inductive arguments. So, in a net shall it is like this that inductive or deductive arguments the conclusion necessarily follows from the premises that is no new information in that

conclusion which is not striated in the premises suppose it is something some new information is present in the conclusion then; that means, the whatever stated in the conclusion goes beyond whatever stated in the premises an all; that means, it is noted deductive kind of argument.

And then the conclusion necessarily follows from the premises; that means, a premises are true the cannot be false and then it is not a open ended kind of arguments its logically close; that means, even if you add 1000s of premises etcetera an all suppose if you have derived some kind of conclusion that is not going to while it the conclusion that we are derived the earlier an all see we will you find this kind of arguments in specific from of reasoning an all that is mathematical kind of reasoning we employee is deductive arguments you might ask way suppose if it is the conclusion nothing is new nothing new is stated in the conclusion.

What is, so great about this deductive arguments an all the one of the strength of a deductive argument is this that an all achieve some kind of certainty an all, and then deductive arguments does not have any variables strength once we have accepted we accepted as 100 percent true wean conclusion also 100 percent true an all absolutely true etcetera is no way in which you can say that.

The conclusion is 90 percent true are 70 percent true etcetera. So, in the case of inductive arguments the conclusion probably follow from the premises and will know that is the new information that premises; that means, especially in the case of when your predicting something will go beyond what is stated in the premises an all. So, based on 2 days whether we can infer come of the other things an all.

So, prediction is whether predictions etcetera there all arguments which come under the category of inductive arguments. So, we will talk about little bit later. So, inductive arguments are open ended argument in the sense that we keep on adding new information then it will we can a strength in the argument an all for example, if you say that let us say 70 5 percent of the commercial airlines a lines completed without in instead an all the next plane you will take we almost certainly arise.

Safely an all if this percentage of safety increase is an all then your strengthening this particular kind of argument an all let us an you went from 705 to 909.99 percent an all means the your increasing strength of the argument an all. So, are now we spoke about

the distinction between inductive and deductive arguments and then we need look in to this accepts that were to come across this inductive arguments an all just like in the case of arguments were in a 1st need to identify premises and identifying the premises we need to have premises indicators in the case of conclusion indicator in the in the case of identifying the conclusion we need to have conclusion indicators suppose if these 2 are missing then we need to find out whether there is any inferentially claim present in the passage we can be factor are inferential claim.

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Inductive Arguments:

- 1 **Indicator Words:** Probable, likely, reasonable.
- 2 Arguments dealing with statistical data, generalizations from past experience, appeals to signs, evidence or authority, and causal relationships.
- 3 A strong argument is one in which it is probable (but not necessary) that if the premises are true, then the conclusion is true.
- 4 A weak argument is one in which it is not probable that if the premises are true, then the conclusion is true.
- 5 A cogent argument is a strong argument in which all of the premises are true.
- 6 An uncogent argument is either a weak argument or a strong argument with at least one false premise.

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One of the this things of present then you say that is an argument present in the English language passage an all. So, our English language passage is crowded with crowded with all these kinds of things an all arguments non arguments etcetera. So, once you identify that this is an argument then the next question arise is what kind of argument it is let us say you identified that it is an inductive argument usually inductive arguments your to look for the indicator words. So, in the argument in an argument you will find these kind of presses then we can say that since to be kind of inductive argument present in a English language passage probably less likely a more likely reasonable closable all this things other presses which commonly see in inductive arguments end other kind of arguments that you commonly come a crows in day to day discuss are these things statistical data once you are try to come off with come off with the statistical data.

You will interpret you will say with some kind of certainty some kind of degree a will make some kind of claims etcetera an all probably 90 percent of itch students are bright are something like that some data, you will infer some of the things are generalization from past experience in the past sun always arise in the east sun I will say with this thing with confidence that sun also rise in the east even today also are you observed all the crows to be most of the crows to be black an all the next true that you are going to observe is also turn out to be black an all appeals appeal to science evidence based on evidence authority most of the case an all causal relationships come under a category of inductive argument causal inferences an particular, there is a reason in cause to effect. So, these are the things which you commonly come across.

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Differences

- ❶ The main difference lies in the the sort of relation the author or expositor of the argument takes there to be between the premises and the conclusion.
- ❷ If the author of the argument believes that the truth of the premises definitely establishes the truth of the conclusion due to definition, logical entailment or mathematical necessity, then the argument is deductive.
- ❸ If the author of the argument does not think that the truth of the premises definitely establishes the truth of the conclusion, but nonetheless believes that their truth provides good reason to believe that the conclusion is true, then the argument is inductive.
- ❹ An inductive argument expresses an inference in which the conclusion goes beyond what is implicit in the premises.
- ❺ A valid deductive argument in which the conclusion can be inferred merely by unpacking what is already stated in the premises

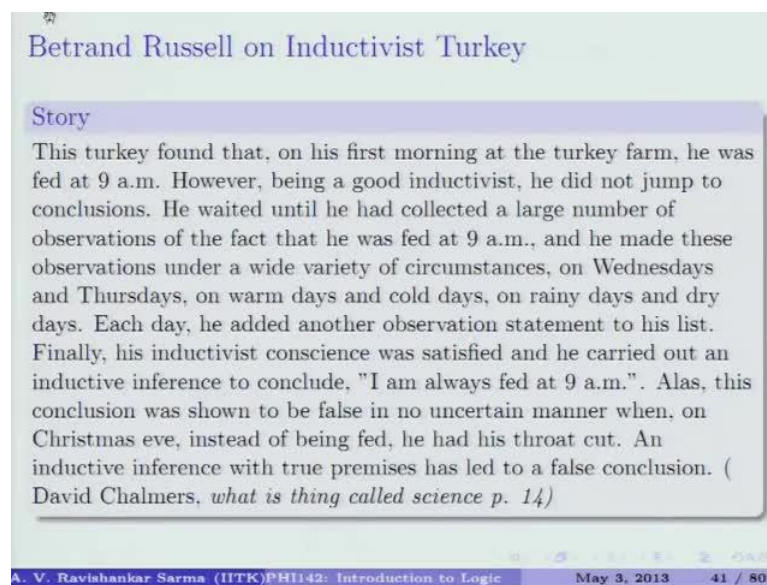
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In day to day discuss. So, now once you are identify that it is an inductive argument the next question that arise is whether it is stronger weak an all strong inductive argument is a 1 in which it is probable, but definitely it is not necessary that the premises are to the conclusion probable true an all a weak inductive argument is a 1 which is not probable that if the premises are true then the conclusion is true an all conclusion may probably false an all we will talk about these particular kind of distinction little bit later an once you identify that is a weak a strong inductive argument a strong inductive argument can be a cogent argument was it is.... So, happened that all the premises are probably true any this called as a cogent argument it is. So, happens that one of the premises is probably false than it is called as an un cogent argument this is the main there are the

main difference as we which you came a cross while distinguish a deductive and inductive arguments.

The main difference lies in the sort of relationship the author or expositor of the argument takes there to be between the premises and the conclusion the relationship between the conclusion in premises if it is necessary that is the deductive argument this probable it is a inductive argument if the author author of the argument believes that the truth of premises definitely establishes the truth of the conclusion due to some kind of definition logical entailment or mathematical necessity and so on so for, it is called as a deductive argument. So, will talk about where do come a cross is deductive argument in while from a inductive arguments also the 3rd distinction is that the other of argument does not thing that the truth of the premises definitely establishes the truth of the conclusion I mean is a conclusion on the probably follows premises, but non a will believes that they truth provides good reason to be believe that the conclusion is true then the argument inductive an all.

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Bertrand Russell on Inductivist Turkey

Story

This turkey found that, on his first morning at the turkey farm, he was fed at 9 a.m. However, being a good inductivist, he did not jump to conclusions. He waited until he had collected a large number of observations of the fact that he was fed at 9 a.m., and he made these observations under a wide variety of circumstances, on Wednesdays and Thursdays, on warm days and cold days, on rainy days and dry days. Each day, he added another observation statement to his list. Finally, his inductivist conscience was satisfied and he carried out an inductive inference to conclude, "I am always fed at 9 a.m.". Alas, this conclusion was shown to be false in no uncertain manner when, on Christmas eve, instead of being fed, he had his throat cut. An inductive inference with true premises has led to a false conclusion. (David Chalmers, *what is thing called science p. 14*)

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So, an inductive argument the forth distinction is this that an inductive argument express an inference in which the conclusion goes beyond what is implicit in the premises an all there is the new information in the conclusion this what we already talked about in a valid deductive argument is a 1 in which the conclusion can be inferred merely by unpacking what is already stated in the premises an all whatever is already implicit in the

premises we are trying to make it express it. So, here is an very interesting story which is formulated by, but in does in great philosopher in mathematician on we shows an instance of the is inductivist turkey this is in example. So, the story goes like this imagine the situation there we a turkey is that turkey is a kind of looks like can an all. So, the turkey found that on his 1st morning.

At the turkey farm he was fed at 9 a m an all. So, the turkey is experience in that in no master is every day is feeding is turkey at 9 am an all is giving breakfast something; however, being a good inductivist the turkey did not jump to the conclusion if is good inductivist these know guaranty that the next day also give the gasses if food at 9 am an all he waited until he had collected a large number of observation of the fact that he as that he was fed at 9 am an all. So, if you want to make your inductive argument little bits strong an all then your sample size etcetera should be logic an all. So, you are repeatedly observe for. So, many cases an all then in know yours your argument we will come strong an all suppose with 2 instances we cannot say that something is good or bad an all, but in know we have to repetitively observe some of the instances an all.

It is very difficult come off with what constitutes sound argument etcetera an all is it 90 percent this enough 50 percent this enough of 40 percent is enough all depends upon it is subjective kind of things an all. So, here in this case in this story the turkey was fed at 9 am every day and we as collected large number of observation every day he was fed at 9 am an all any he made this observation under a wide variety of circumstances etcetera it is not enough that an all under various circumstances is master fed in at 9 am all the fact in a is busy are may be training all kinds of situation circumstances an all is food a did not miss is food an all turkey any made these observation under wide variety of circumstances there is the important things for a good inductive argument an all on Wednesday and Thursday on warm days and you on cold day etcetera an all and find even rainy days and dry day.

So, happened that he was fed at 9 am sharp is master was. So, good that fed in at 9 am each day he added another observation statement to his list an all strengthening is argument based on is observation an all. So, finally, is inductivist conscience was satisfied and he carried out an inductive inference to conclude that I am always fed at 9 am an all. So, this is the what in a even most of scientist will also do an all when there try to come off with some kind of inferring conclusions an all will there base their

experiments 1000 say experiments we will do and then once there convince satisfied with. So, many experiments etcetera and all they will infer some of the things and all we conclude something. So, in this case the turkey concluded that the.

Repeated observation he was fed at 9 am Thursday warm day cold day all days he was fed at 9 am all. So, at last last this con. So, now, he came to the conclusion that am always fed at 9 am on. So, based on the repeated observations is a story is story and all. So, turkey came to this conclusion that and all I am going to be fed at 9 am you on tomorrow also. So, this conclusion was shown to be false in no uncertain manner when let us say in 1 find christmas eve and all instead being fed at 9 am and all he had his throat cut and all. So, the men several days etcetera and all your faded 9 am and all the does not give a guaranty that is going to be fed the next day also its. So, happened that in an the fine christmas eve and all is master took in for cut throat and all. So, true inductive is turkey.

What as to do is question and all despised is repeated observation and then we need to see that under wide variety of circumstance say etcetera based on all this information etcetera and all he came to the particular kind of this nothing wrong with the inductive is turkey, but this argument shows that argument that that turkey has come of way I am going to be fed at 9 am based on all the repeated observation etcetera this conclusion we shown to be false and all an inductive inference with 2 premises and let to false kind of conclusion and all this is what is stated in david chalmers book what is what is this thing called science and all. So, what does what does this story tells us is simply this that despite in a various you have evidence and your gut feeling says that that is going to be the case and all in the case of inductive argument.

Is no guaranty that your conclusion necessarily follows on the premises these different in the case of deductive arguments if the conclusions are true a premises are true in the conclusion cannot be false and all. So, this is this story tells us that in in the case of induction conclusion probably follows from the premises and then despite all the evidence etcetera and all we cannot justify that this inductive argument is justified and all. So, we will talk about this particular kind of story little bit later, but in this particular kind of course, will be mainly focusing or attention on that deduction part. So, basically in will not talk much about induction. So, basically we are trying to capture some kind of

mathematical reasoning which can be done with the help of deduction and all, so where to be the come across deductive argument.

So, deductive arguments usually we will come across in mathematics etcetera and all and whenever you come across some kind of valid form which are talked about in the last class a valid form is considered to be a valid kind of argument and all if the argument is having a valid form then the particular kind of argument is valid if it is having invalid form then it is called as an invalid kind of argument. So, in this lecture what I spoke about is like this 1st we identified the once we recognizing recognize the arguments and all the next question that comes to us is what if of argument it is then we asked some set of questions it which they depending upon whether are answer is yes or no we classified the argument in to deductive or inductive argument.

There is one thing which is which I missed it out usually this is the mistake which commonly traditionally speaking this is the case deductive argument is a 1 in which is in move from particulars to general, where are in the case of inductive argument we move from general to particular an all, but that definition will not sir was well an all because we can we can have particular arguments, but we can still have general kind of a conclusion an all. So, there are some kind of deductive arguments we move from particulars to general also where as there are some the may be some inductive arguments move from particular general to particular also. So, these are the some of the problems which we commonly encounter.

So, this is not a definition an all what is important here is this that is truth preserving whether the conclusion follows from the premises are is a argument is having variables strength, these are the sum of important questions that we need to ask to judge whether it is an inductive argument are deductive argument usually inductive arguments which we come across in arguments of science prediction etcetera an all which will talk about it in detail little bit later and deductive arguments are the once which will find it in the arguments of mathematics etcetera sometimes you come across of kind of valid forms say in going talk about in next lecture. So, these are some of the important distinction between the deductive and inductive arguments, and in the next lecture what we are going to talk about is were to the come across is deductive and inductive arguments what is the significance of is deductive and inductive arguments, when we also talk about

whether a deductive argument is when we say that a deductive argument is valid when we say that deductive argument is invalid is any method which you can judge.

Whether the argument is valid or invalid in the case of inductive arguments if the argument is, whether the argument is strong are weak out to be judge this thinks. And once it is strong or weak whether it is cogent argument are cogent argument. These are the questions that we are going to answer in the next lecture.