Introduction to Logic
Prof. A.V. Ravishankar Sarma
Department of Humanities and social Sciences
Indian Institute of Technology, Kanpur

Lecture – 5
Truth Validity and Soundness

Welcome back in the last few lectures we given in any English language passage we try to identify the argument. So, we said that whenever there is a premise and conclusion indicator, then we said that you know their seems to be some kind of argument present in a English language passage are may be well you are reading a text book scientific text book etcetera an all or may be a Newspaper are something else.

So, it how to identify in argument was the first important tasks for us, then we started recognizing the argument and we distinguish with column non-arguments; non-argument in a sense that reports piece of advices, suggestions, warnings etcetera and all. All this things comes under non-arguments in a sense that there all non-inferential passages and all. So, there is no inferential claim involved in those kinds of passages in all that is why that passage does not contain any argument.

So, once we recognize is the argument in all. So, then next question comes to us is, what kind of argument it is. So, there are 2 kinds of argument which we usually come across in introductory logic course are in logic, at least 2 kinds of arguments. Which we come across 1 is: Inductive Argument, another 1 is Deductive Argument based on how the conclusion follow the premises we are saying that it is a Deductive Argument or it is Inductive Argument and all.

If the conclusion necessarily follows from the premises, then it is called as kind of Deductive Argument. If the conclusion probably follows from the premises, then it is called as an Inductive Argument. And also we said that, in the case of Deductive Argument there is no new information in the conclusion which is not there in the premises. Whatever is there in the premises, we are trying to make it express it in the conclusion where the conclusion is in the case of Inductive Arguments.

The conclusion goes beyond what is treated in the premises and all. So, inductive arguments are in general that diffusible nature that means, addition of new information

might invalid it the whole conclusions that you all drown earlier. In the case of Deductive Arguments which is called as Monotonic it is not non-diffusible.

So, they are even if you add more information in all you are whole conclusion will still follow. So, this is what we have done so for. So, now once we identify recognize the arguments and identified that this is an Inductive Argument and this is Deductive Arguments then the next question comes to us is what we mean by validity of Deductive Arguments.

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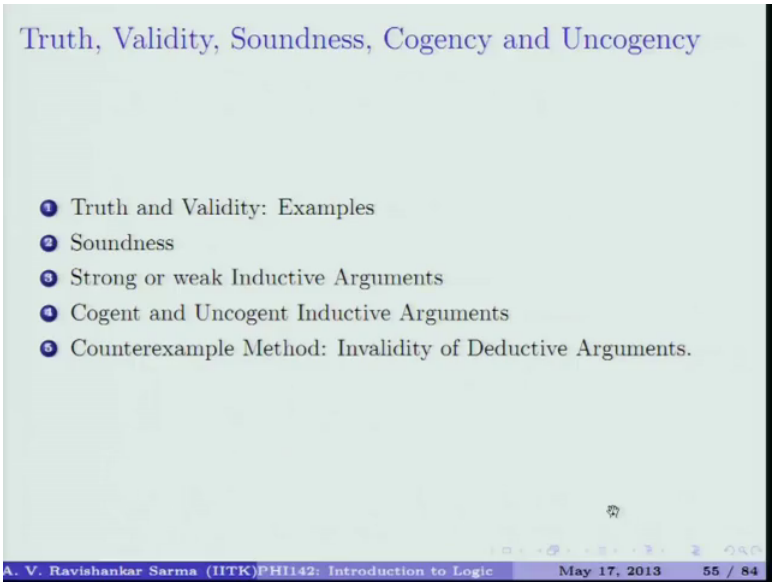

And what we mean by the strength of a given inductive argument and all. In this class what I am going to talk about are this things. So, first I will talk about what the mean by truth and it is the relationship with the validity and I will consider few examples. And then it is not in off that the arguments are valid and then it has to be 1 extra condition we need we will impose that is what we called it as Soundness.

So, this is the case for the Deductive Arguments; a Deductive Arguments can be valid or invalid. Valid deductive argument can be sounder and sounder and all. In the case of Inductive Arguments we can only talk about the strength of the argument. So we can say that, a given inductive argument is as the weak or strong. If it is the strong Inductive Argument the next question comes to us is, whether it is a Cogent or Uncogent argument and all. A Cogent inductive argument is a 1 in which it has probably true premises at all.

Whereas an Uncogent argument is a 1 in which at least it has 1 false premises. So, this are the things which will be a explaining in detail and there is 1 important method which is the kind of commonsensical method it is not a formal method etcetera and all. Will be using a other formal decision procedure little bit later, but since we are considering everything from the scratch the basic concepts. So, we will be talking about a specific method which is very interesting in all. So, that method is called as Counter Example method. If time per minutes will going to the details of this 1.

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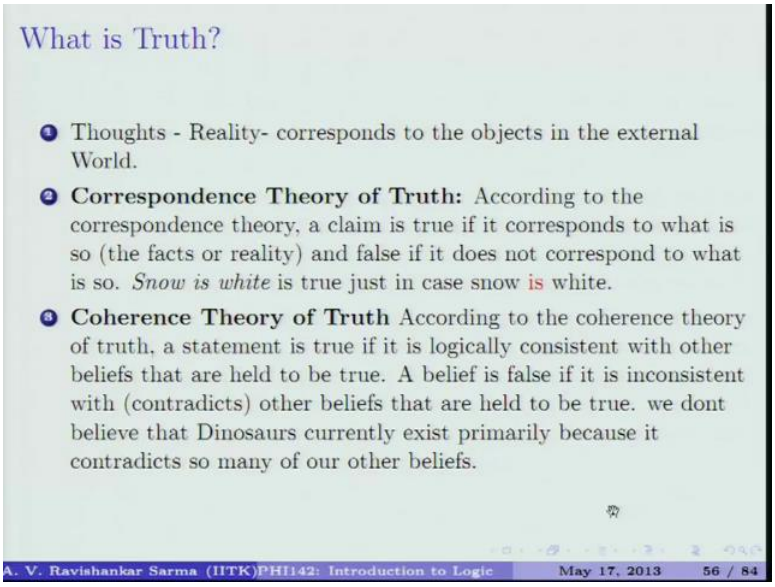

So, now, the most important thing which will be asking our self is what you mean by truth. So, this is the most difficult question to answer it is a million dollar kind of question it is not easy to come off with an answer and all. So, but as per as possible we are trying to define what we true their at least the definition of truth that is seems to be acceptable true us for some time being.

So, there are we are all thinking beings we think a lot, so there are some thought's. And then the thought's corresponding to some kind of reality; reality of the world or external world etcetera and all when thought's refer to some kind of object that exist actually in the world. And it is a mapping between your thought and the actual object which exists in the world when we say that, there is a correspondent between whatever you thing and then whatever actually exist there.

Suppose, if I show is something that in a for example, if I say's that this is a pen then this corresponds to 1 of the objects that exist write in front of me. So, that is why the statement is true suppose if I say that, this is a donkey and the no 1 will be in a position to belief that this is a donkey and all. It is not referring to the actual facts etcetera that exist in the world and all.

So, there are various theories of truth which I am not going in to the details of these things. So, there are debits between these theories of truth and all, but the most widely used are you can say, default theory of truth is a corresponding theory of truth. So, what this correspondence theory of truth I am not going to the details of this things, but I will briefly mentioned that in a here are 3 theories of truth which we commonly use and all.

So, mostly we will be using correspondence and coherence theory of truth. There is another theory of truth which is your due to pragmatist that pragmatic theory of truth which I will talk about it little bit later. So, the correspondence theory of truth is as follows. So, I called into the correspondence theory a claim; that means, a can be a conclusion or you will be claiming lots of things in all.

So, a claim is considered to be true mostly it is a conclusion in an argument. If it correspondence to what it is so that means, it refers to some kind of facts, reality etcetera and all. If it is not referring to the facts of matter or the reality that exist in the world etcetera and all the sentence is false and all. So, if he does not correspond to what it is, so then that is considered to be a false statement in all. Suppose if I say that this is cat, then this not referring to cat and all.

So, it is referring to some kind of pen etcetera, so if I say that you this is pen and this is corresponding to the actual pen that exist in the world and all. So, it corresponds to the actual world that exists in the world and all. So that is why that is sentence is true suppose, if I say that this is a cat or donkey or a something else, then that particular kind of statement is false and all.

It is as simple as that they should be some kind of correspondence with the reality or actual matters of fact that we commonly encounter in day to day discuss. So for example, if you say snow is white just in case snow is actually white and all. Suppose, if snow is black in color then whatever you are saying is considered to be false and all. Actually,

that is not the case, so that is why it is false and all, is as simple as that and most of the scientist etcetera their all comfortable with this kind of theory of truth.

So, we are not going into the depth of these theories to what extend this theories works etcetera and all. At this moment we are just briefly mentioning what mean by truth and all. So, since truth has is his connection to the validity so that is why we need to talk about some minimal kind of things about the truth and all. So, will gradually it discuss in grated a detail when we talk about truth in proposition logic, a truth in predicate logic etcetera and all.

So, there is another theory of truth which is slightly different from the correspondence theory of truth. Correspondence theory of truth tells us that, in a they should be some correspondence between whatever you are saying and the actual world, actual object that exist in the world and all. So, Coherence Theory of Truth according to the Coherence Theory of Truth is, statement is true if it is logically consistent with other believes that are already held to be true and all.

We are all having some kind of belief system we accept so many beliefs to be true etcetera and all. So, something is logically consistent with our existent beliefs and all, then that particular kind of belief is coherence with the belief that you already have at this moment. So, a belief is false if it is inconsistent are contradicts with other beliefs that are held to be true earlier.

So for example, if you say that we do not believe Dinosaurs currently exist, because they all got extinct a long back some material fell on the, then all Dinosaurs got extinct as that is what we know actual factor an matter of fact is that. So, we do not believe that Dinosaurs currently exist primarily because; it contradicts so many of our other scientific beliefs and all.

So, we know that it extinct etcetera and all. So, it is a in consist with what we believe at this this point of time. So, any belief which is in consist with the existing is a belief is what we he call it as in coherent and all. So, what is important here this is the there is any need not be any correspondence between whatever you think and the actual object that exist in the world and all.

But, here it should be it should maintain some kind of logical consistency and all, so if you belief p or not p in the other beliefs such as for example, if you come across any belief such as p and not p which is a contradiction. And which course against p or not p and all. So, this not logically consistent with that particular kind of thing, so it is not coherent with that particular kind of thing.

So, this is what we mean by Coherence Theory of Truth and it has is zone problems which I am not going into the details of that 1. So, there are many beliefs there are some issues with respect to Coherence Theory of Truth which I am not going to the details of that particular kind of thing and all. So, that is another kind of theory of truth which is called as Pragmatic Theory of Truth which is due to fames American philosopher William James and all.

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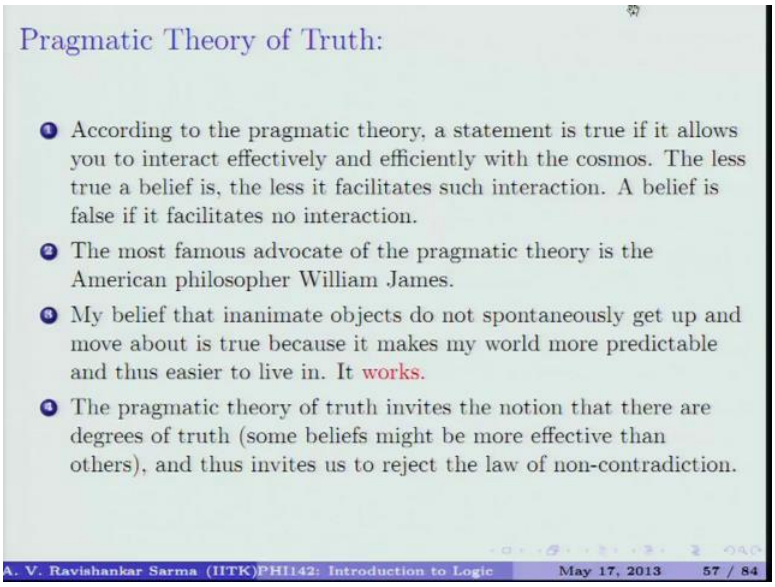

So, according to the Pragmatic Theory of Truth any statement, a statement is the sentence which is which can which spoken has the as the true or false and all. So, that statement is true if it allows you to interact effectively and efficiently with you are external world an all cosmos; what we are calling it as. So, according to this the less true a beliefs is, the less it facilitates the kind of interaction that we had talking about.

So, that is means belief is false if it is it facilitates no possible interaction and all. In that case, it is false an all if it facilitates interaction then it is considered to be a true well. This is the little bit difficult in a abstract concept to understand and all. So there are for

example, to put it in simple terms for example, if you say at my belief that in animate objects; objects does not have any light's etcetera and all.

For example, pen which is in front of me do not spontaneously get up and move about etcetera and all, we do not belief such kind of thing to true and all. Because, it makes may world more predictable and thus easier to live in. So, my believe that inanimate objects do not spontaneously get up and move about it is true because, it makes my world more predictable and thus easier to live in an all he belief that is the world behaves in a certain way and all.

We do not expect that all of a sedan rocks will fly and are rocks will flatten what biggs will fly etcetera and all. Because, that is an work in universe behaves in such a way's that it does not work and all. So, what matters most here is what works and all, what works of the end of the day is, what matters the most in the case of Pragmatic Theory of Truth. So, the belief that inanimate objects all of instated in start flying etcetera will not work and all.

So, which is goes against the principles of nature etcetera and all. So, that Pragmatic Theory of Truth invites 1 problem of this 1 is this that it invites the notion that there are degrees of truth and all. Since it is stinwals some kind of degrees of truth for the statements in all; that means, it laws per that is say 70 percent true, 50 percent true etcetera and all.

The prepositions of statements, so some belief might be we in that sense effective than the others. And thus involves has to reject 1 of the important fundamental laws of logic that is Law of Non Contradiction. Law of Non Contradiction say's that, a statement cannot be both true ands both false and all. But, if he allows for the degrees for the truth then a you can very well say that sentence can be true, a sentence can be false as well as.

For example, a sentence is 0.5 true and the other sentence is 0.5 false etcetera and all. So, a sentence can be both true and both false as well as. So, this leads to the rejection of a law non contradiction, then if he reject the law of non contradiction will be doing some different kinds of logic and all.

Initially we said that the logics that will be following in this course will obey perfectly obey the 3 fundamental laws of logic they are: Law of Identity, Law of which says that p

is p, Law of Excluded Middle which says that p or not p and the Law of Non Contradiction a statement cannot be both true, both false simultaneous sentences saying that same time.

So, if allow for Pragmatic Theory of Truth then we need to get away from law non contradiction etcetera and all. So, there are some other issues with respect to pragmatic theory of true which have not going to the details of this 1, but mostly the default theory of truth is the correspondence theory of truth. At this moment what we need to take into consideration is this that suppose if I say that, this is a pen that means, actually referring to the actual pen and all that is why the sentence is true and all.

Suppose if I say that, this is the donkeys and start referring to the donkey which is referring to actual into the pen so that why, the sentence is false and all. For example, if I say that their only 1 2 doors in this room in all actually there is only 1 door here in this room so that is why, a statement is false, so is as simples as statement.

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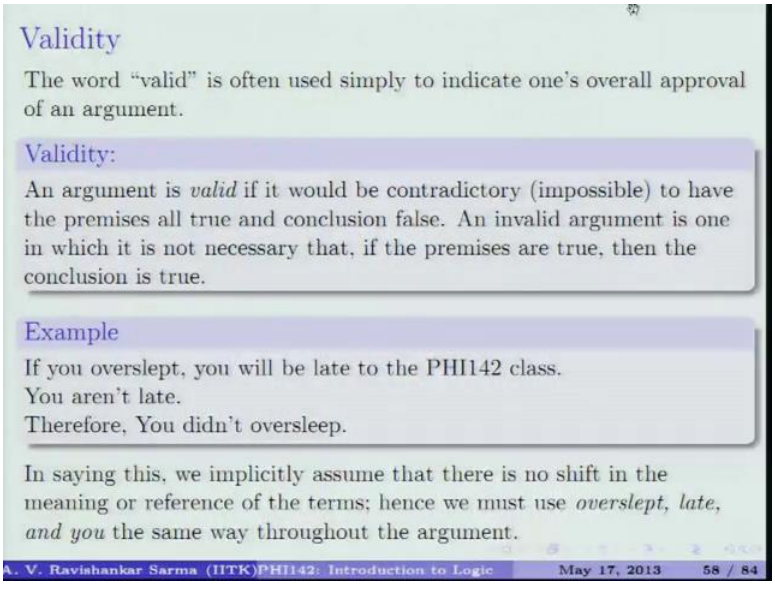

So, now, coming to the concept of Validity, so the validity is the most important in the fundamental concept that you 1 weak to learn in any logic course validity talks about what follows from what. So, apteral the 1 of the important tax of logic is to understand what follows from what and all. You have some set of statements in all those statements are leading to another set of statements which we call it as claims and all.

So, the word “Valid” is often used simply indicate once overall approval of an argument something which we have accept it to be the final kind of point as something conclusion etcetera. That is considered as you reach to some kind of agreement and all then that is a called as validity and all. In general day to day discus that is, what we mean by validity and all. For example, 2 friends are accepting on certain things a reach some kind of agreement and they will start believing that kind of think and all.

But, in logic in particular an argument is valid if it is impossible for the conclusion to be a false given the premises are true and all. So, an argument is valid if it would be contradictory are impossible to have all the premises to and the conclusion false and all. An invalid argument is a 1 in which it is not necessary that if the premises are true, the conclusion can be true and all.

So, what is the most important thing which we need to know is this that deductive arguments are truth preserving kind of arguments and all. So that means, if you assume the premises to be true, there is no way in which you can make you conclusion false and all. So, if the premises are true then that the guarantees that your conclusion is also true and all.

So, the most important thing which is important in case of validity is this that, we to roller the possibility that you have true premises and a false conclusion and all. You can very well have this particular kind of thing that 1 of the premises can be false, if you can have true conclusion it also works and all or both premises can be false, but still conclusion is true that also seems to be for us.

And in the same way 1 of the premises is the true; another premises false and the conclusion is a true or false etcetera an in also it is acceptable to us. But what he need to role or completely is this that, the premises are true the conclusion cannot be false and all. So, if that is case then the argument is called as Valid and all otherwise the argument is invalid.

So, we need to ensure that if you have 2 premises and you cannot have false conclusion and all. So, that what we need to keep it in mind for example, if you say if you argue in this way if you overslept, you will be late to the a class and of course, you are not late to the class that means, you did not oversleep that is why you could come to the class on end time.

So, this argument is an example of Modus Tollens the first 1 can be represent as A implies B and not B; second one is represented as not B. So, that is why it is not A and all. So, this argument is valid argument in a sense that even if you tried to construct a counter example. Counter example in a sense that, you have 2 premises and you try to come off with a counter example and all like false conclusion. So, then you will sail come to know that it is difficult to that is impact it is impossible to construct a counter example in which the premises are true and they conclusion is false and all.

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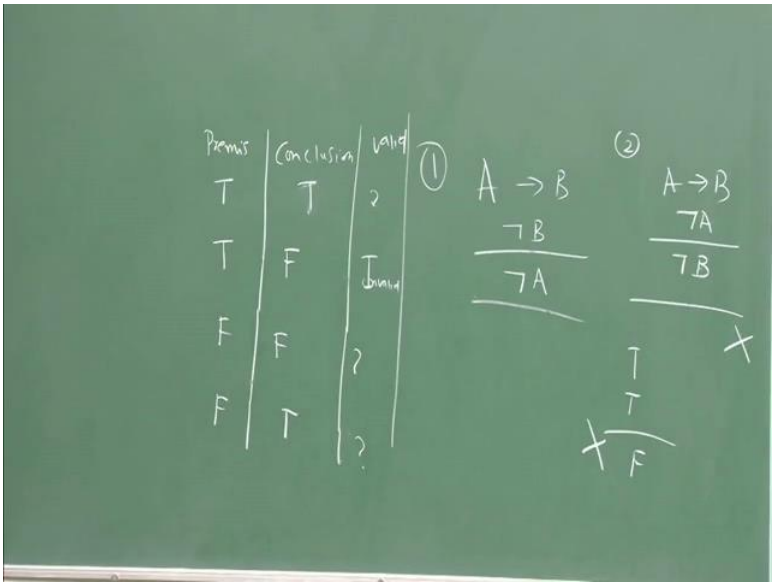

So, for constructing a counter example what he need to do is first you need to talk about, the form of this argumentation A this is the first 1 is A implies B. And the second 1 is not B and then this is what is the case if you overslept, then you will be late to the class; you are not late to the class that means, you did not oversleep sleep and all. So, that what seems to be the case and all this is the valid form and this is the valid argument.

Suppose, if you are use in this sense the same thing are A implies B and then if you say not A and then you infer not B then this argument is invalid. Because, you can come off with an instance where you can make both this premises true and the conclusion false and all; but in this case it is very way it is impossible to construct a counter example and all. What we you mean by constructing a counter example?

So, they are certain things which we have obviously, know this things to be true or obviously, you know that the certain things which are false and all. For example, if you

say all cats are it is accepted to be true for as this is obvious thing which we know that that true and all. Or if you say all cats are fish, then that argument that statement is false and all or if you say that all cats of 5 legs etcetera for example.

A sack of fun you can take you consideration that statement is false and all. So, like that you take some true statements an all forget about what A B tells and all. Once you extract it into some kind of form and all, so then you substitute for a anything an all cats, dogs, maa, anything and all or donkey's are anything. And then see whether you could come off with a counter example and all counter example in a sense that what needs to be rolled out we have 2 premises and a false conclusion. This has to be rolled out in all suppose, if he can cook of situation where A implies B is a case and then this is also true, this is also true, then they conclusion is false and all. They could come off with such kind of example, then this argument is obviously, invalid and all that means, you have come with a counter example and all Coming up with a counter example means, it is not necessary that the conclusion follows from the premises and all; that means, you have showed with an example that you have a true premises and you have a false conclusion. So, this is what needs to be rolled out and all. So, to put in simple terms this are your premises and this is your conclusion, so if you have premises are true and the conclusion as true is no problem and all.

So, if the premises are true and the conclusion is false then this is validity an all this are your premises and this is your conclusion and then we are talking about validity. So, your conclusion is true, then let us stock about this question mark little bit later. So, when you have 2 premises and a false conclusion, definitely the argument is invalid and all. So, when you have true premises and a false conclusion the argument is clearly invalid and all.

But there are 3 other situation in all where you have premises can be true, conclusion can be true, but validity it may be valid or it may be invalid. So, you can have both premises false and at you can have a valid argument or you can have false premises and true conclusion, but at it can be a valid argument and all. So, what I am trying to say is this that out of the 3 4 possible that I have discussed.

There your conclusion can both be true, the conclusion your premises can both be true conclusion can also be true. That seems to be a valid argument no problem for that you

can come off with valid argument in that way or you can also come off with true premises and... This need to be rolled out in all this is what is the most important thing. If you can come across with a true in a false conclusion, the argument is clearly invalid then in all other cases it is considered as a valid argument and all.

They should ensure that, you eliminate this particular kind of case an all this is that dissuasive factor for knowing that the argument is invalid. To come across with the true premise and a false conclusion obviously, the argument is invalid and all. So, a then the other question comes to us is what about this other 3 cases and all. So, in that case the question mark indicates that may be valid argument, but you can talk about the other features such as soundness etcetera and all.

So, a valid argument which consists of true premises is called as a Sound Argument and all; which will gradually enter into the details and all. So, in the first example if you overslept then you will be late to the PHI142 class and you and you are not late. So, that is why you did not to oversleep that is seems to be a valid found, valid argument. So, another important thing which he need to note is this that in saying that, you will did not oversleep based on all this assumptions and all.

First assumptions which have considered to be true, we implicitly assumed that there is no shifting the meaning of meaning or reference of the terms that you have used and all. Hence you must used overslept, late the terms which are used here and you etcetera and all in the same way, throughout this argument in all. So, in the case of deductive argument it is taken for granted that there is no shift in the meaning of the words that you have used in the argument and all.

For example, if you say this room is made up of items are invisible so then means, this room will invisible and all. In that case, items the word items this is used into different senses and all, there is a shift in meaning from first premise to the second premises. So, that is not allowed in the case of deductive arguments and all. So, it is taken for granted that there is no shift in the meaning of the words that you have used in the argument.

So, another important thing which we need to note is this that for validity things need not have to exist actually in the world and all. You can argue in this way that, all squares are circles and all circles are parallelograms. So, you can say that all squares are

parallelograms all squares are parallelograms that is the conclusion here that obviously, true and all. But other around is not the case all parallelograms not squares and all.

So, the conclusion is true, but you observed that it has false premises an all so this false and the this particular kind of category. So, all circles are squares that are false statements, all circles are squares, all squares are circles that are obviously, false; all circles are parallelograms that also considered being false. So, but at it is considered to be a valid argument for the sack of assumption you can takes some other premises to be true.

And you have to see whether the conclusion is false or not, if the conclusion is false then the argument is invalid. But, in this case a conclusion is obviously, true and all, so innovates preserving the truth and all. In a sense that, you assume that all squares are circles is true and all. So, this is only for our assumption actually we know that it is it goes against to the principles of mathematics said in a square cannot be a circle and all.

It is counter into to as, so but What we have seen here in this case in this situation is this that you have false premises, but still you have a true conclusion, but at the argument is valid and all. But it is impossible for us to come off with in argument in which you have true premises and obviously, false conclusion and all. So, that is seems to be rolled out and all, so these this kind of argument it is an invalid kind argument you can come off with any counter example and which you can show that this 2 are true.

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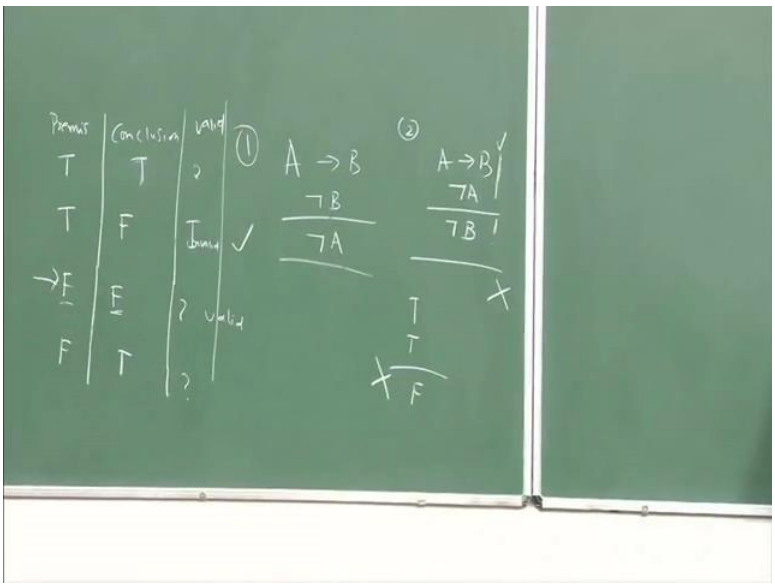

Then, you can show that this conclusion this is false and all. For example, if you say if it rains then the grass is wet, it did not rain a grass is not wet and all off course, it did not rain in all, but the grass can still be wet and all. In several deferent ways for example, a sprinkler made be on a maybe somebody ports some water there etcetera and all. So; that means, you could come of with an instance where you would come off with a counter example in which you true premises and a false conclusion.

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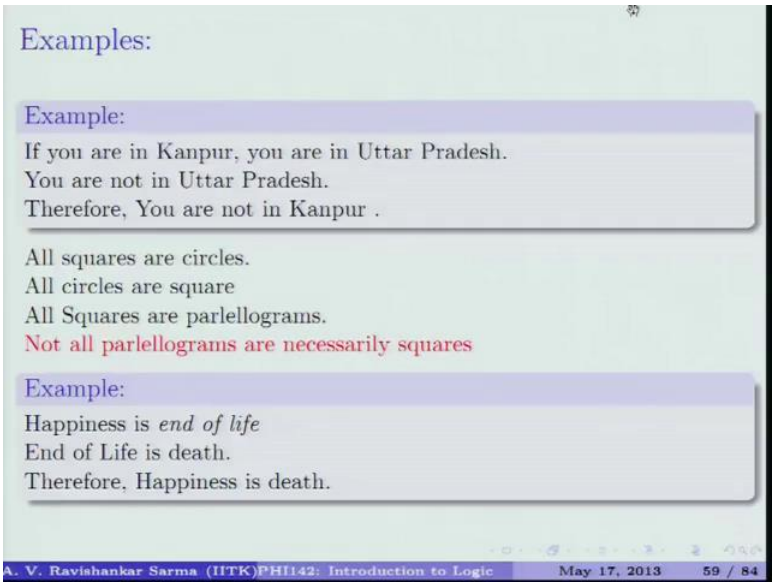

So, their other examples which you commonly come strength an our point and that, you cannot come across is very difficult to cook of an example where you have true premises and a false conclusion for a valid kind of argument. But it you can say that, it is a valid argument and all, so that argument has to be invalid and all.

Suppose, if you have say if you are in Kanpur you are obviously, in Uttar Pradesh because Kanpur is a part of Uttar Pradesh off course, if you are not in Uttar Pradesh then he should be in Kanpur and all. So, this forward thing and all so you can ask suppose, I do not know anything about Kanpur and Uttar Pradesh or anything and all. How we know that this argument is valid or invalid? So, just transform this thing into in appropriate form.

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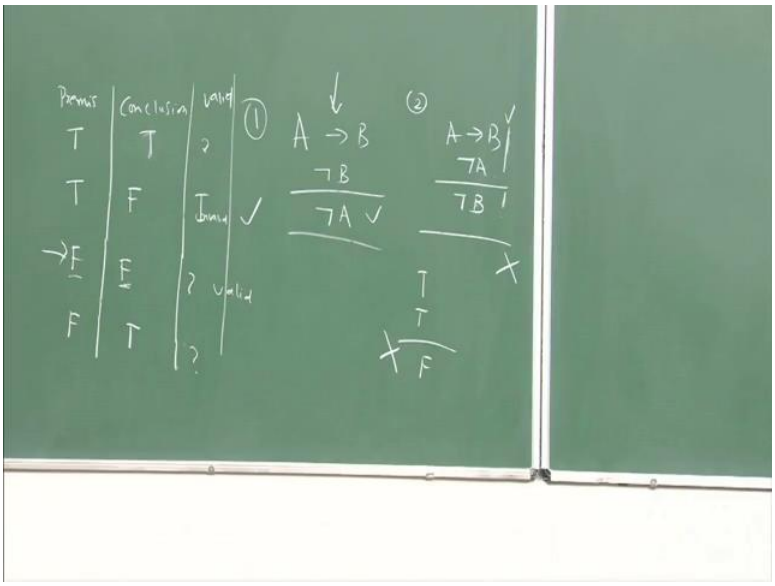

So, this is what you come across if you are in Kanpur, you are in Uttar Pradesh, you are not in Uttar Pradesh then that means, you are also not in Kanpur and all you are somewhere else in India and all. So, this seems to be the case since a valid form obviously, this is a valid kind of argument. The next 1 is the 1 which we already discussed in greater detail all squares are circles, all circles are squares; so that is why all squares are parallelograms.

So, you have false premises, but you have a true conclusion and all, so that also permitted it is also valid kind of perfectly valid kind of argument and all. But you might ask how suppose if I accept this particular kinds of things have in it is does not make any sense to us or not. So for that, we need to invoke and other kind of property which is give emphasis some of the extra features of logic that is the soundness and all.

If you incorporate soundness into consideration, then we can roll out this particular kind of argument by saying that this argument is not sound. It is a not sound in a sense that, 1 of the premises is false and all off course, in this case both premises are false so obviously, it is as un sound kind of argument. So, there are some arguments in which I told in the last few class that there is no way in which you can analyze that is arguments are valid or invalid and all.

Unless and until you they the seems to be some mistakes in this argument and all. But, it is very difficult to recognize it unless until you analyze the content carefully and all. So,

the argument goes like this happiness is end of life that what we a trying to a achieve, so everyone will be trying for happiness a at least a they end of the day or may be end of his life etcetera.

And we know that end of life is obviously, death etcetera and therefore, if you say that happiness is death they have nobody will be in a position to believe that this follows from the those 2 things and all. Because in the in this argument what we have done is happiness a end of life in used into deferent sense and all.

So, 1 is for achieving something that is the main purpose which is used happiness and in the second 1 it is used in a different sense that is end of life, in end of breath etcetera and all that leads to death and all. So, that is the shift in meaning of the word are price that you are used that is the end of life is used into deferent senses.

So, that is why this argument has some kind of mistake when we talk about fallacies and will talk about these kinds of arguments and all. Otherwise at a the first in sense if you observe this kinds of argument it looks as if that they are valid or arguments and all like: A implies B B implies C and A implies C is the case and all.

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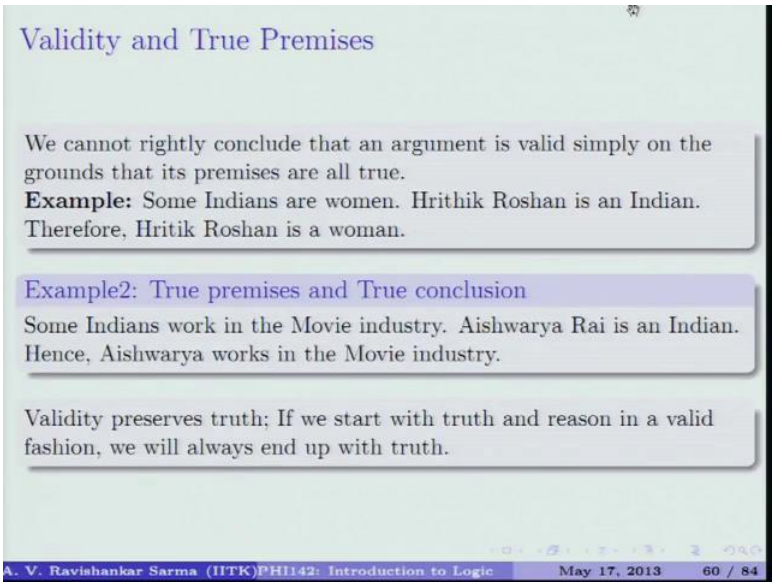

So, what is connection between validity and true premises and all which we already discussed in greater detail there are 4 cases which I mentioned. So, the only thing which would focused your attention is on this thing your premises are true and the conclusion is

false then obviously, the argument is invalid and all that is the second case which we shown it on the board an all.

In all other cases the argument can still be valid and all, so we can rightly conclude that an argument is valid simply on the grounds that your premises are all true we cannot guaranteed that particular kind of thing and all. You can have true, but still you're a argument may be invalid and all. Let us as considered as simple example, like this some Indians are women suppose if you say that that is why case a say some all not all will can be women and all.

Away some Indians are women let us say, for famous Bollywood actor Hrithik Roshan is an Indian. So, there for Hrithik Roshan is the women for example, if you say that particular thing then this argument is obviously, invalid and all. Because, it may be the case that is Hrithik Roshan is a man or a women and all.

The first premises that only some Indians are women and all, but if you replace this argument in a deferent way for example, all Indian are women and all which goes beyond our belief that in a can be the case and all. But hypothetically you imagine a situation in which only people will come across are women also in India. The imagine is situation in assume to true and all, then Hrithik Roshan is in Indian.

Then in that case, the first sentence which we have used all Indian's are women which as no exception and all that means, there is no case in which you know somebody is the women and all. So, no exceptions that university generalization in that case Hrithik Roshan has to be women also. But in this case, some Indians are women Hrithik Roshan is an Indian both are true, but still the argument is invalid and all.

So, we cannot judge only with the help of true premises an all that you know the argument is and all. But here is in instance you have 2 premises, but still you have an invalid kind of argument and all. So, but validity preserves the degrees the truth and all. so that, truth preserving kind of thing. Suppose, if you assume these 2 arguments to be true, the conclusion cannot be false and all.

So, in the first case some Indians are women means Indians are not women's all it is the also the true and all; which we have not taking into consideration here in this particular kind of argument. Some x or y means some y's or x also, so there is same as that

particular kind of thing, some x are not y also. So, the other instance is this that if you have true premises and true conclusion, but still the argument may be invalid and all.

So, some Indians working Movie Industry for example, Aishwarya Rai is an Indian again hence Aishwarya Rai works in movie industry and all. So, the premise say's that an only some Indians are movie industry an all Aishwarya Rai is an Indian so obviously, the second premise you cannot make it false in all. So, the only when which you Aishwarya Rai works in the movie industry just because, she is an Indian does not seem to fallow from this thing all are true, but at the argument seems to be not acceptable towards if you had said that all Indian work in the movie industry.

Then, the Aishwarya Rai is in Indian then if might be the case that Aishwarya Rai has to work in the movie industry and all. But here it is say's that some Indians work in movie industry and all; only some it says about some and all some does not work in the movie industry and all. What happened if Aishwarya Rai is Indian, but still she does not come under the category of some Indians who does not work in the movie industry and all?

In that case the you will go come off with a counter example in which you true premises in a false conclusion Aishwarya Rai does not work in the movie industry. So, what is important thing all this example some all this examples is this that, validity is the what we is the 1 which we used to preserve that truth and all, if you start with a truth an reason in a valid fashion; that means, if you have form so valid, then we will always end of with truth and all. You have true premises and you will and not end of with the false conclusion and all.

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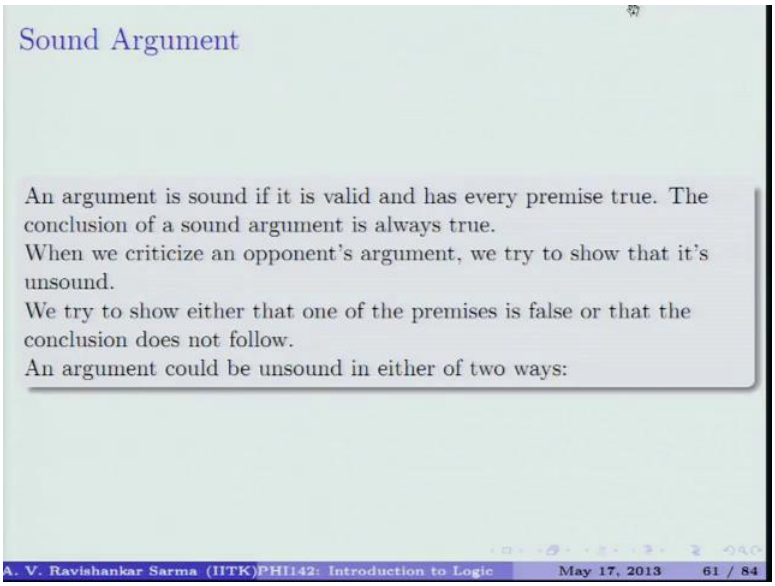

So, that is what is the thing which we need to take into consideration the next important feature with we which we will be knowing in get detail is this that it is not enough that your arguments are valid, but it has to be sound in off and all. So, what is this extra feature that we are trying to add for an argument say, an argument is sound if it is valid first of all it has to be valid and all that means, the conclusion necessarily follows from the premises.

The extra thing which it has to be extra feature that it has should have is this that, it should have 1 of the premises to be true also, the not 1 of premises every the premises has to be true and all. It so happens that you and your argument if the argument is valid, but it has true premises as well as. So, how do we know that this premises are true or false etcetera and all?

Again in a it is not the job of a logician to look in to are verified the facts etcetera and all this is job of someone else and all. Heavy scientist might verify these facts to be true etcetera and all. So, then based on the evidence that you got a scientist of verified it and then true statements you could come off with an how it is the leading to the other statement and all is 1 which we are trying to talk about.

So, now if you want to know that the argument is sound then it has to be valid; that means, it is impossible for the conclusion to be false given the premises which you are accepting it to be true. It is the first thing that is the valid kind of argument and the

second thing which you need to see is this that, whether all the premises are actually true or not.

So, again you can say how do we know that the thing is true and all, we use the default theory of truth which we have discussed in the beginning of this class that you know a sentence is true; which if it is the corresponding to the actual world the a corresponding to the object in the actual world which exist and all. So, we try to show that either that 1 of the premises is false or that the conclusion does not follow.

In either case, you can show that it is a unsound argument and argument could be sound in either of this 2 ways and all. For example, sometimes some somebody convince this you with this kind of argument that it look as if that for example, simple example which we have already taking in to consideration all squares are all circles or squares all squares are circles and all circles are parallelograms; all squares are circles and all, all squares are parallelograms.

So, that is the 1 which we discussed in the last few mints, so if your friend comes and tells you this particular kind of thing then you cannot question the validity of the argument and all. If I assumed that first 2 premise are true, then since it is a Deductive Argument. So, it preservers a truth an all this is no way in which all squares are parallelograms can be false and all.

So, that is a perfectly valid kind of argument, the only choice that you have is this that you can show that the given argument is unsounded by say, by stating that 1 your premises is false and all off course, in this case both premises are false and all. So, in that way you can show that this particular argument all circles are all squares are circles, all circles are parallelograms and all squares are parallelograms is false a it is a unsound kind of argument and all.

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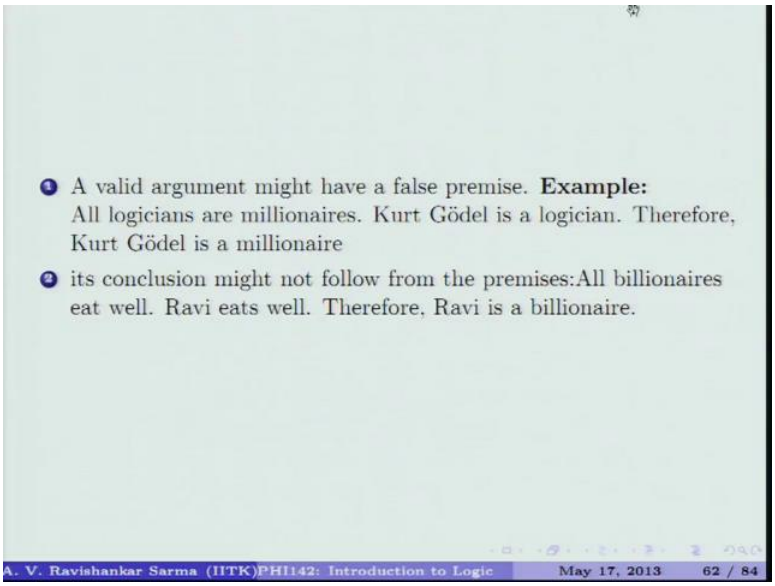

So, there are situations in which a you have a valid argument might have some false premises and all. For example: if you say all logicians are millionaires and all. Kurt Gödel is the outstanding logician that is true statement. So, Kurt Gödel is a logician therefore, Kurt Gödel has to be a millionaire. So, this argument is a valid argument, but we all off us know that not all actually if you verify the facts etcetera, historical facts etcetera, all logicians cannot be millionaires and all.

If it is a case then well and good that, but actually unfortunately or fortunate is all the case and all. So, in this case this valid argument, but it is a unsound argument because, you can very well show that all logicians are millionaires has exception and all. At least so on 1 instants where it is not the case and all. So, it is conclusion might not follow from the premises for example, if you say all billionaires eat well and all they are lot of money reach an etcetera and all.

They eat well over eating etcetera example: Ravi eats well just because Ravi eats well and all. He cannot come under the category that is a billionaire and all. So, this is the kind of invalid kind of what I am trying to say is this that, in the first argument you can show that 1 of the premises is false or the other where showing that the argument is unsound is that you know the conclusion does not fallow from the premises and all.

At mean you show that it is in invalid argument and all; all invalid arguments are automatically unsound arguments. So, this is the connection between truth and validity

just because, you have true premises the does not mean that argument is valid and all. You can have true premises and true conclusion, but yet the argument may be invalid and all. So, for validity what is important is that if you accept the premises to be true the conclusion cannot be false and all.

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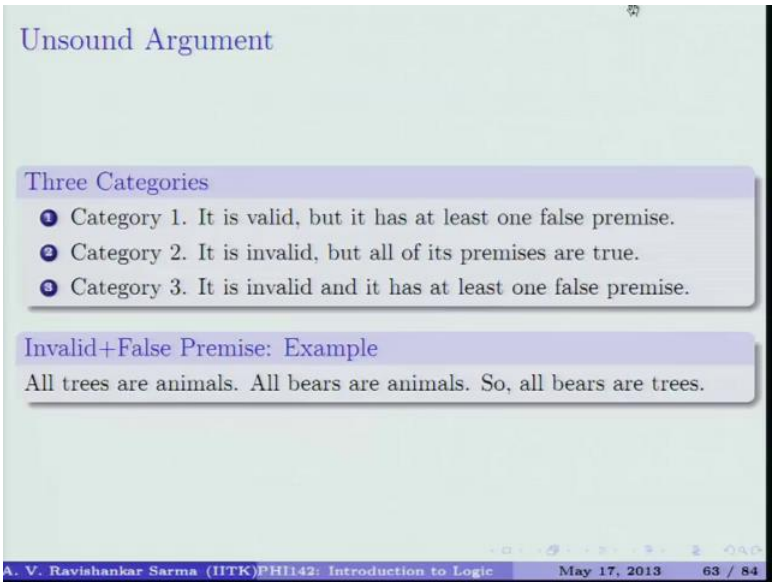

So; that means, your rolling out the possibility of invalidity and all. So, an unsound argument you will come across in 3 deferent categories: the first category the argument is valid, but it has at least 1 false premise and all it is 1 of the premises is false. So, category 2 is this that obviously, it is an invalid argument; that means, the conclusion does not follows from the premises, but all it is premises may be true and all not may be where their true and all.

In category 3: it can be any invalid argument, but it has at least 1 false premise and all. So, in either or this in this 3 categories we can show that, the argument is unsounded and all. First off all invalid arguments for all automatically unsound and all so that means, invalid plus false premise for example, there are some examples for this kind of thing all tree's are animals.

Of course, that is a false preposition all bas are animals off course animals only that is a true statement. So, if you say that all bears are tree and all this is the very strange kind of conclusion that you have trying to come of with. First off all bears at tree is does not follow from all tree's are animals, all bears are animals, but you might ask why it is a

case that you know it is not a valid kind of argument. But the best way of looking at it is a by seeing the form of this arguments all x are y all this is like this particular kind of thing as will go and the details of it all tree's are animals.

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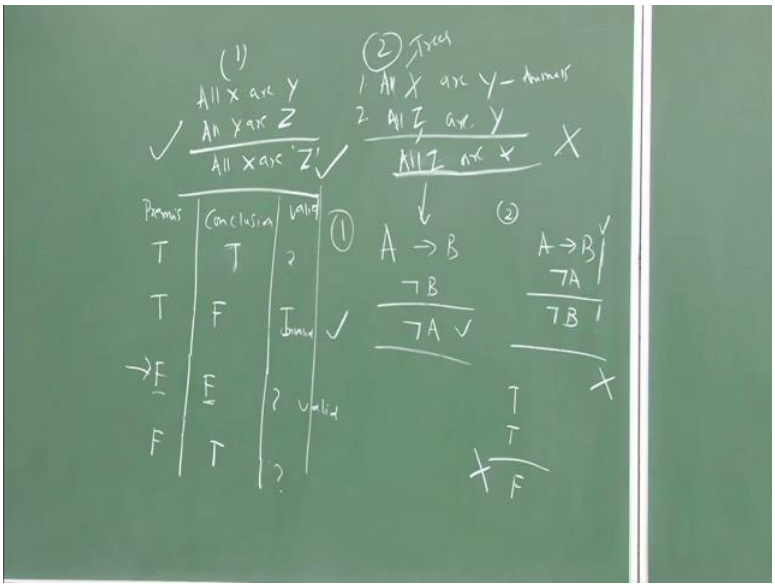

So, example if you all x are y, so if I example if you say that thing X stands for tree' and Y stands for animals an all tree's and then the this is animals and all is the first argument. And the second argument is, all bears are animals and all. So, all Z Z stands for bears all Z's are animals and all, so this is Y. So, in off from this you're concluding that what is that you're concluding? All bears are tree's an all Z; Z is considered to be bears and all or tree's that means X.

So, this is the 1 which we are trying to get come off with. So, this is in invalid argument the valid form of this 1 is this all X are Y and all Y's are Z, then you say that all X are Z. So, if this is put in this particular kind of format then it can be consider as a valid argument and all. So, this clearly an invalid argument obviously, it is an unsound kind of argument and all.

Suppose if you transfer mating such a way that come with that particular kind of thing. The first 1 this is the right kind of form this is obviously, invalid and all; this is a valid kind of argument and all. So, you came across that particular kind of valid argument, but let us say 1 of the premises false and all. Then in that case, the argument will become an unsound argument and all.

So, unsoundness arises in 3 deferent categories and all. So, suppose if you friend presents you some kind of argument, which are convincing and there is no way which you can show that it is invalid kind of thing that means, the conclusion seems to be necessarily following from the premises; the only way in you can the only choice that you have is this that, you can show that one of the premises to be false and all that is the only thing which you can do.

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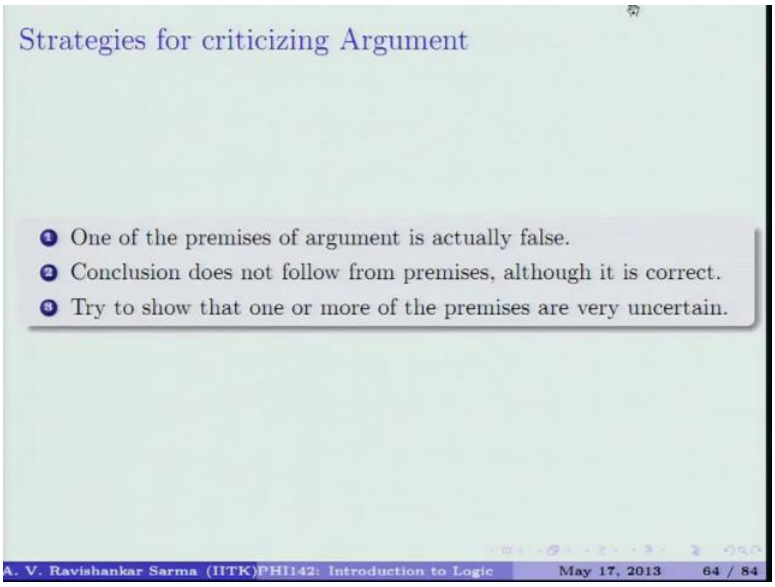

The conclusion does not follow from the premises all though it is correct or you can try to show that 1 or more premises are very uncertain and all. Off course, this is the another way of saying that you know you make it uncertain the sense that a you're not 100 percent true and all, may true or may be false etcetera and all. Then in that case, you are converting the argument into some kind of inductive argument and all.

So, it an the sense that conclusion does not need not necessarily follow from the premises, but conclusion only probably follows from the premises and all. So that means, conclusion only probably for us in the premises means you could come off with a counter example in which your premises are true a conclusion is false and all; even if a come off with 1 single instance and that is good enough to say that, the argument is invalid and all. Even if you suppose if you have 100 tomatoes and all, the tomato that you picked up is a rotten tomato, then that is good enough to show that the basket that come out if contains has rotten tomatoes and all.

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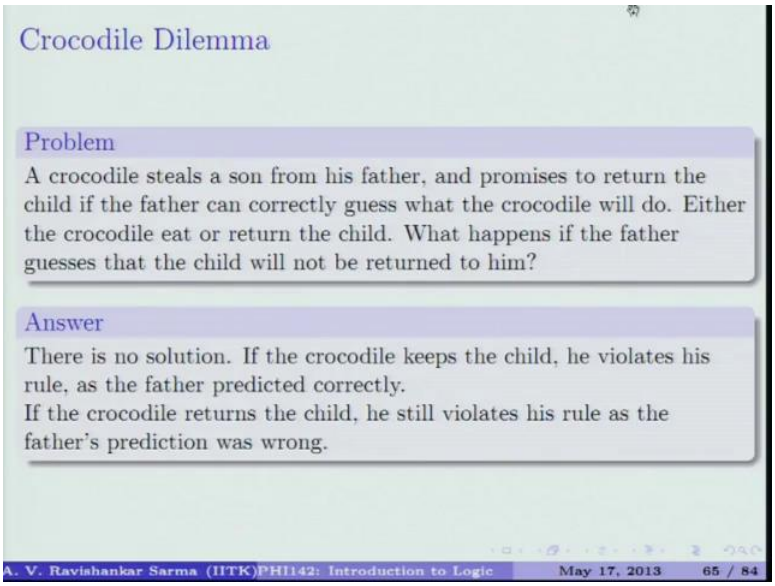

So, here is in interesting kind of dilemma I mean which is it strictly deferent from what we are trying to discuss and all. So, this dilemma goes like this is in very important kind of problem a which arises in the prepositional logic in particular. So, gradually we will going to the details of this particular kinds of thing. So, the story goes like this, a crocodile steals a son from his father, but the crocodile is little bit kind in off a generals you give some kind of options and all.

They not just treat away ss the treat away son and all, but he promises to return the chilled suppose if he asking is father to guess certain kinds of thing and all. You guess whether I am going to return your child or not that is what you know, but intention of crocodile is as that to eat or return the baby and all; baby or kid here. So, a crocodiles steals a son from his father, and promises to return the child if the father can correctly guess what the crocodile is going to do and all.

Suppose, if crocodile intense eat and all if the father guess that, is going to return the baby and all. So, then he will the fathers guess is wrong. So, is not going to return the baby, so he will eat to crocodile will simply eat the child and all. So, if it goes against what the crocodile is interned into do then the fathers guess is obviously, wrong and all.

Then he is not returned the baby and all. So, either the crocodile has 2 options in all either he will eat or he will return the child and all. If the father guesses correctly and all that means, is goes exactly in accordance with the intentions of the crocodile then you

will return the baby and all otherwise, you will eat the baby and all. What happens if the father guesses that the child will not be return to him and all?

Suppose, if that is the case and all then what is going to happened? So, for this particular kind of problem this is the kind of unsolvable kind of problem and all. Because, there is no solution for this problem if the crocodile keeps the child, then he violates his rule. Because, the father as father as predicted correctly and all the rule that he has violated is he has return the baby, but he is the actually intention is that, he will so the hungry and he will eat away eat the baby and all.

So, since father predicted correctly he has to return the baby, but he has eaten the baby an all, so he cannot return. So, that seems to be a problem if the crocodile returns child and all, then it is still violates is rule. A rule in a sense that, in a so predicted correctly I will return the baby if you predicted wrongly and I will need the baby and all.

So if the crocodile returns child and all, then he still violate is rule as father prediction was wrong, is fathers prediction was wrong in he has eat the baby he cannot return the baby and all. So, it is like it like some kind of paradoxical situation are not a paradoxical situation is crocodile is in some kind of dilemma and all is that eat or return the baby and all.

So, this problem gets unsolved and so this is this problem can be return in formal terms like this. So, this can be considered as the valid kind of argument and all, but 1 can show that he can be unsound etcetera and all.

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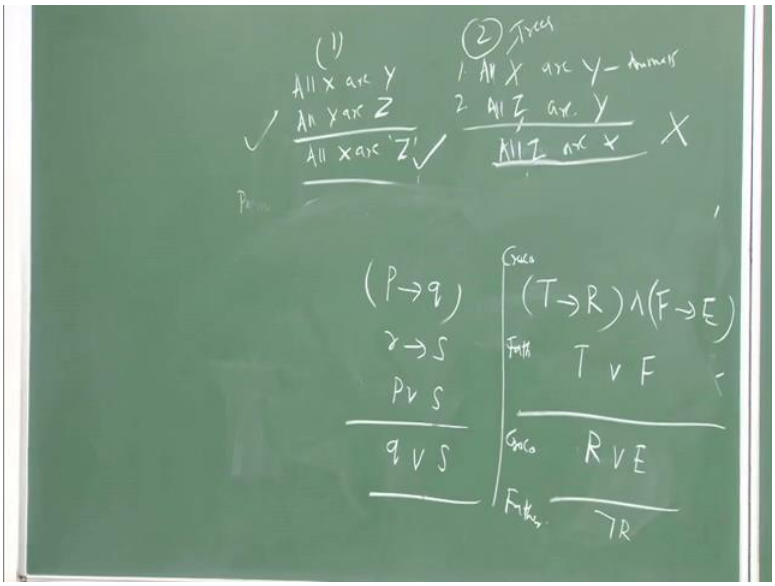

So, this problem is simply written has this thing p implies q and r implies s then p r s, then it will be as a q r s and all. So, it is like in the case of crocodiles dilemma has that to eat or return the baby is the 1 which is in a some kind of dilemma and all. If he returns the baby there is a problem and if he eats the bay he then also you cannot return the baby, then also there is your problem.

So, is in a dilemma what to do and all, so if the fathers guess is correct then his going to return the baby and if the fathers guess false is going to eat the baby and all. So, now the father can only guess either true or false and all. There is no middle value between these things and all it has to be true, it has to false and all is guess has to be correct, a guess has to false in all.

If he goes exactly account to the intentions of the crocodile then the guess is correct otherwise, suppose for a for example, crocodile intend to eat and all father say's he going to return the baby and all. So, that goes against that 1 inconsistence with that 1, so that is false and all. So, now from this like crocodile has only, so these 2 things and all. So, this is seems to be a perfectly valid kind of argument and all.

So, this is what is crocodile has to say and this is father and then crocodile and then father will respond in certain way. Suppose, if you say he is not going to return the baby and all. So, then it leads to crocodile will it puts crocodile into some kind of dilemma and all actually, crocodile is intend to eat the baby he so hungry and all. So, now there is no

solution in particular in this sense that if the crocodile keep the child, then he violates is rule has the father predicate correctly and all.

If father predicate correctly in he has to return the baby, but he actually he has to eaten the baby and all. If the crocodile returns the child and then that means, he still violates is rule that father is prediction was wrong and all. So, in this case a problem gets unsolved and all. So, we will stop here and then we will move on to the strength of inductive arguments in the next class.

So, what we have simply said was this that we started with the deferent theories of truth and then we talked about the relationship between truth and validity and all. It is not just enough that you know you premises are true, the conclusion the just based on the premises are true we cannot say that argument is valid. So, for the validity what is important here is this that, the premises are true the conclusion cannot be false. So, we will continue with the strength of the inductive arguments it may be in the next class.