Inverse Methods in Heat Transfer
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Lecture No # 05
Module No # 01
Introduction to Week 2

Welcome to week 2 of the course on inverse methods in heat transfer being run on NPTEL I am Balaji Srinivasan.

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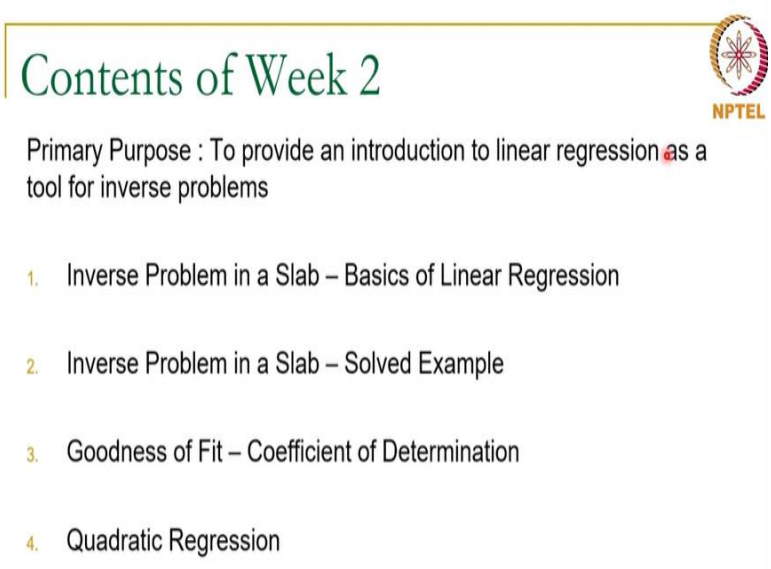

Just to give you brief introduction of the contents that will be covering in week 2. The primarily purpose of this week is to provide an introduction to linear regression as a tool for inverse problems. All of you would already be familiar with linear regression most probably, if you are not then this would serve as a first introduction even if you are you would see hopefully a few new things.

And also, how to use it as a tool for solving inverse problems. We will continue with linear regression in the next week as well. But this week is just a preliminary simple idea. So, where we will start is? We will start with a simple inverse problem in a slab, which I introduce you to in the last week. And we will cover the basics of linear regression with this as a motivation. of course, real inverse problems are much more complex than this.

But this again shows you some simple ideas about how inverse problems are solved in a really simple setting. Then after that we will be solving a solved examples based on the theory that

we would have been derived on linear regression. A third idea which might not be quite familiar to you is the idea of once you have a fit, So let us say you have a curve which fits some amount of data, you can actually have especially when its linear regression, you have a characterization how good or bad this curve is?

And this quantity is known as the goodness of fit, also well this quantity measures the goodness of it and it is actually called the coefficient of determination and we will be looking at that. Finally, we will see how to extend the ideas that we have for linear regression in case you do not have the linear curve but you actually have a quadratic curve. And in the next week after this one we will be continuing this 2-polynomial regression and other types of problems.

So that is it very simple kind of content for this week. The basis of linear regression we actually use an example, we talk about how to determine how good or bad our fit is. And finally, we will move on to something slightly more complicated which is quadratic regression see you in week 2.