Python for Data Science
Department of Computer Science and Engineering
Indian Institute of Technology, Madras

Lecture - 08
Lists Part - 2

Welcome to the lecture. In the previous lecture, we saw how to create a list and also how to access the elements in the list and also we saw indexing in Python.

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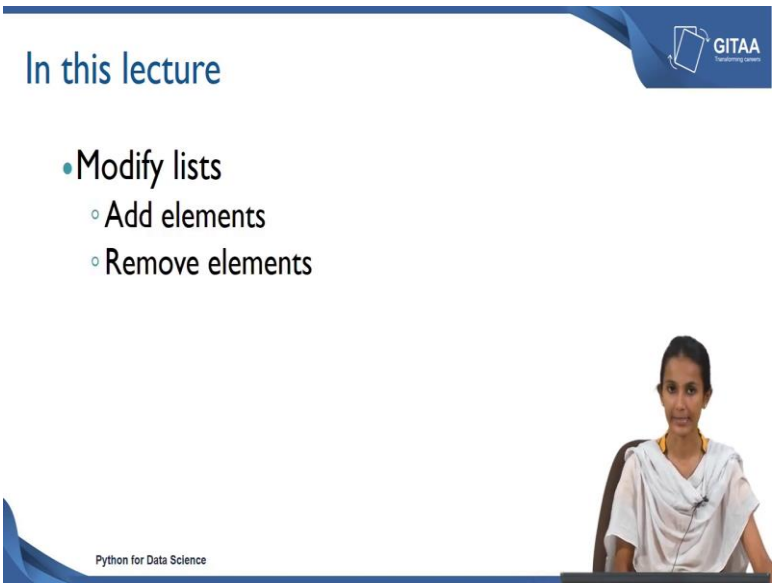

So, in this lecture, we will see how to modify the lists; so, basically how to add the elements and also how to remove the elements from the list.

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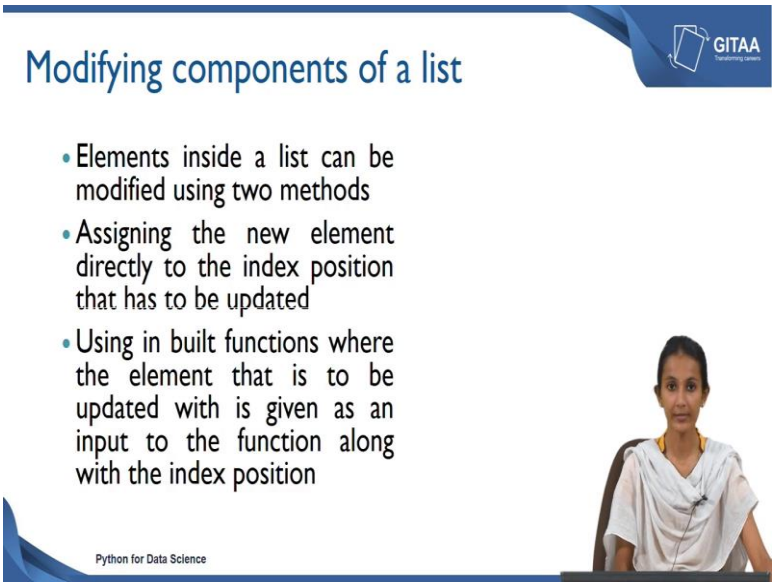

So, first one is modifying components of a list. So, elements inside the list can be modified using the two methods; the first method is we can assign the new element value based on the index position. So, second one is using the inbuilt functions. So, we can give as an input to the function along with the index value.

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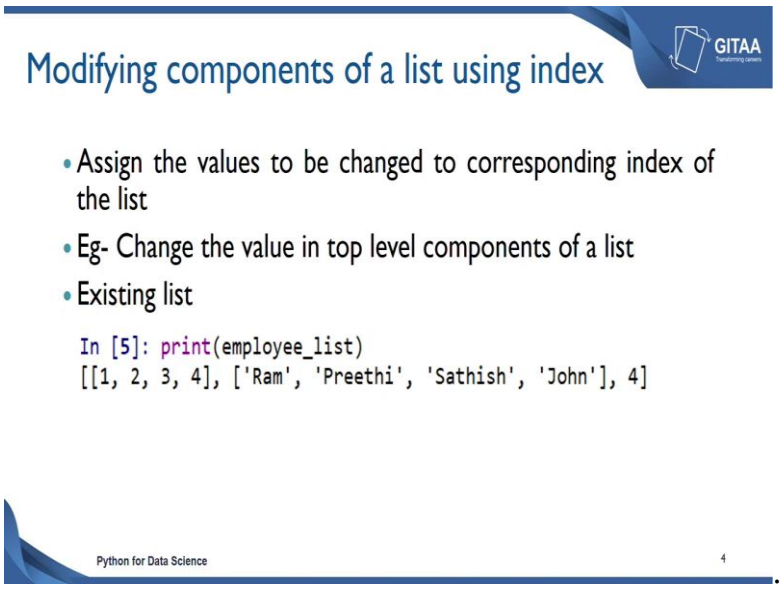

Modifying components of a list using the index: so, first we will need to assign the values to be changed to the corresponding index of a list. So, there are two levels in a list. So, one is called as a top level component of a list and other one is called as a

sublevel component of a list. So, let us say if I wanted to change the value in top level component of a list. So, this is our existing list so, which we have already created employee_list which has a levels id which is 1, 2, 3 and 4; employee_names Ram, Preethi, Sathish and John and the number of employees which as 4.

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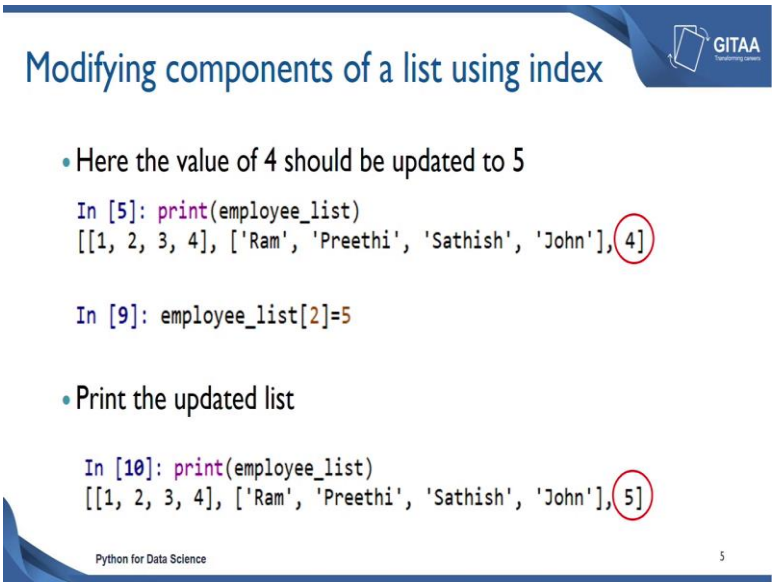

Let us say if I wanted to change the value of 4 to 5 so, which is the number of employees. So, we have total number of employees is 4 if I wanted to change to 5. So, then ids stands for the level 0 Ram, Preethi, Sathish, John so, which is employee_names which is at the level of 1 and number of employees at the level of 2.

Employee_list 2. So, I am assigning it to 5. So, if I print the updated list so, 4 will be replaced with 5. So, the encircled ones has been replaced.

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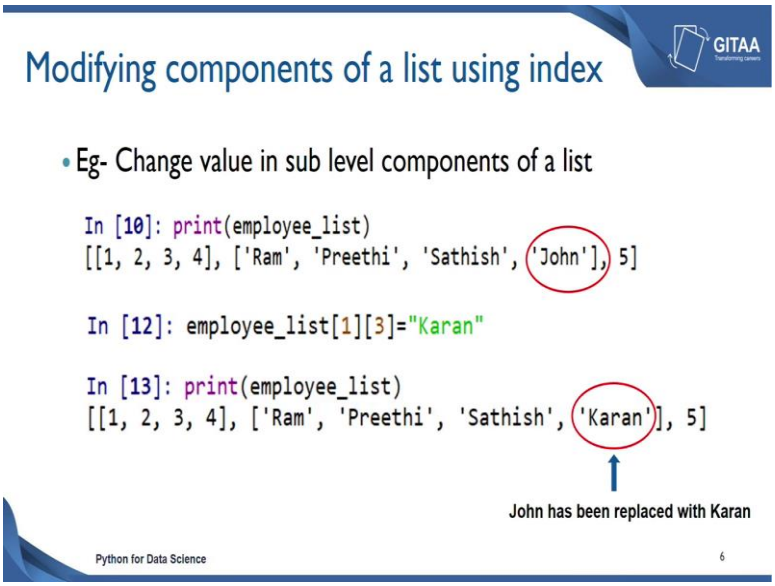

Let us say if I wanted to change the value in sub level component of a list. So, this is our list. So, if I wanted to change John to Karan, how will you do that? So, 1 2 3 4 which is basically id; again it is a level 0, employee_names is level 1 and number of employees is level 2.

So, if I give employee_list 1 which is our top level component so, our sub level is 3. So, John is placed in the fourth position which has a index number 3 so, I wanted to replace with Karan. So, I am giving inside the double quotes. So, if I print the updated list so, John will be replaced with Karan.

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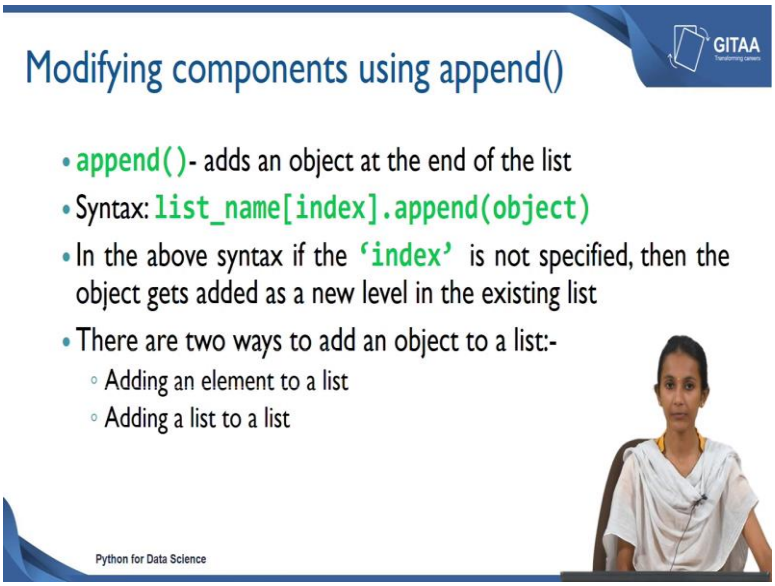

Next we look at the inbuilt functions available in python. So, let us say if I wanted to modify components using the append method. So, what is append does is it is an adds an object at the end of the list. So, we let us look at the syntax of the append; list name within the square brackets, you have to specify the index number dot append and inside the parenthesis you have to specify the object.

So, if the index is not specified the elements, the object gets added at the new level in the existing list. There are two ways to add an object to a list. First is you can add an element to a list, second one you can add a list to a list so, which is called as the concatenation of a list. First we will see how to add an element to a list using the append method.

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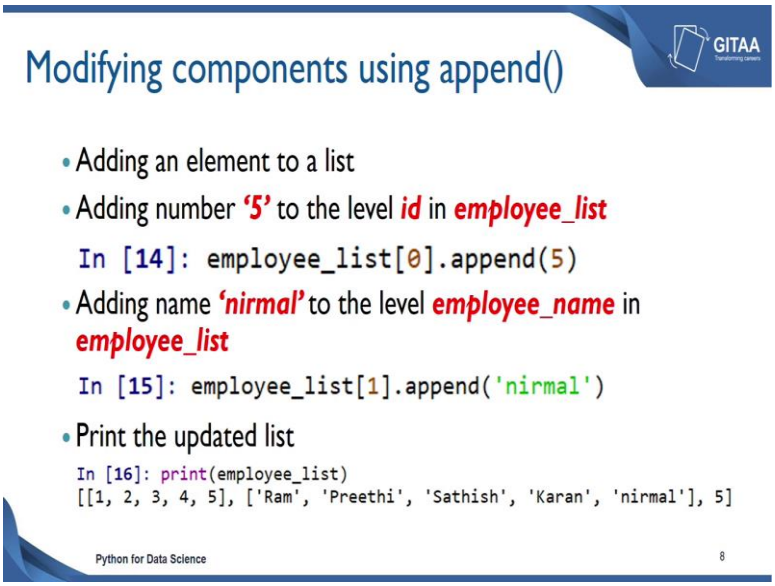

Let us say if I wanted to add an element to a list. So, today one person has joined. So, employee id will be increased by 1 and also employee_name will be increased by 1 right.

Let us say if I wanted to add the id 5 in the employee_list. So, employee_list is a list name inside the square brackets, we have to mention the index number which is 0 dot append of 5. Similarly I wanted to add nirmal to the level employee_name in the list. employee_list again, it will be instead of 0, it will be 1, dot append nirmal.

If we print the updated lists; now it will have 5 ids 1, 2, 3 and 4 and 5 and we have 5 employee_names, Ram, Preethi, Sathish, Karan and Nirmal and also the number of employees is 5.

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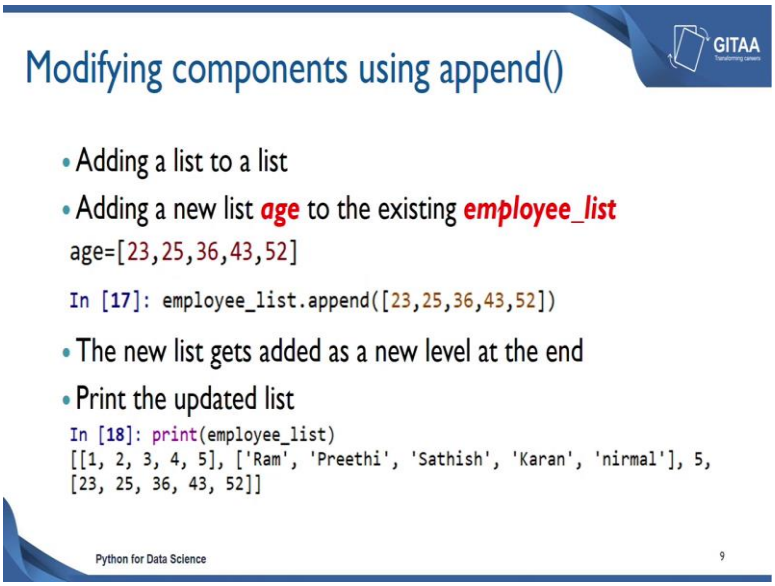

Let us say if I wanted to add a list to a list. Adding a new list age to the existing employee_list. So, now what I will do is I will create a age as a list and I will appended to the existing employee_list. So, we already have 5 employees. So, the respective ages will also be created as a list.

So, I am creating a age as a list which is equal to 23, 25, 36, 43 and 52. So, if I wanted to append to the existing list so, I will call the employee_lists.append on the sets of values. So, this is a one way or else you can do employee_list.append(age) as well.

So, this list its gets added as a new level at the end of the existing list. So, if you print the updated list so, we already had id, employee_name, number of employees. Now since we have added age to the existing employee_list so, it will be added at the last.

So, next we will use a inbuilt function called insert. So, in append, we saw how to add a list at the last. So, if you wanted to add an element at the specified position, then insert command works well.

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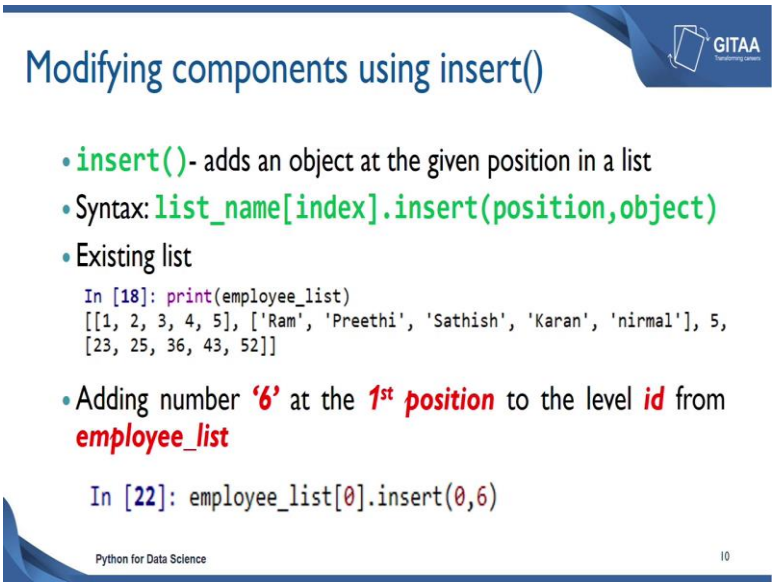

So, what does insert does is, it adds an object at the given position in the list. So, let us look at the syntax; list_name[index].insert(position,object). So, this is our existing list. So, 1, 2, 3 ids and the 5 employee_names number of employees and the respective ages. Let us say if I wanted to add id number 6 to the id at the first position.

So, it will be employee_list name and we have to specify the index. So, the id as a level 0 dot insert position is at which position you wanted to insert. So, I am inserting at the first position. So, corresponding index will be 0 in python indexing starts from 0 to n-1. So, I wanted to add the value of 5. So, in the object I will specify 6.

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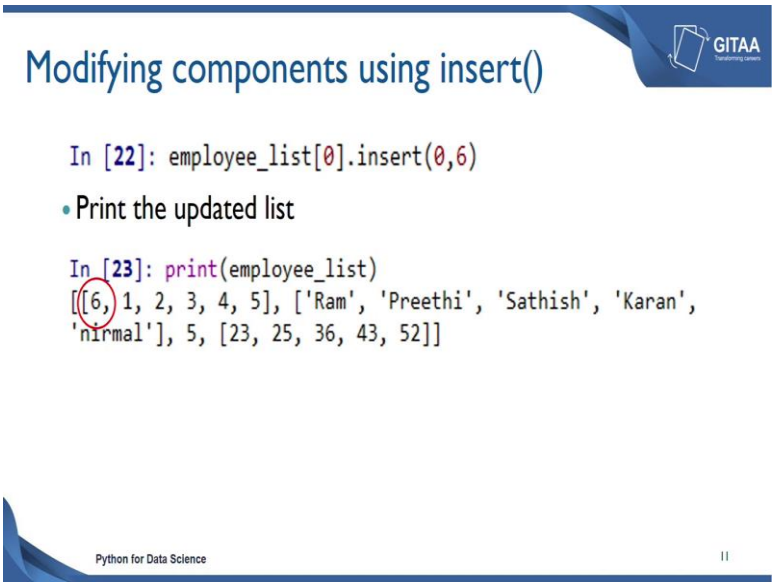

So, if you print the updated list 6 id will be placed at the first position. So, the indexing will be this 0 remaining will be same.

Next we will see how to remove elements from the list. So, there are various methods we can use del, remove and pop. So, let us look at one by one.

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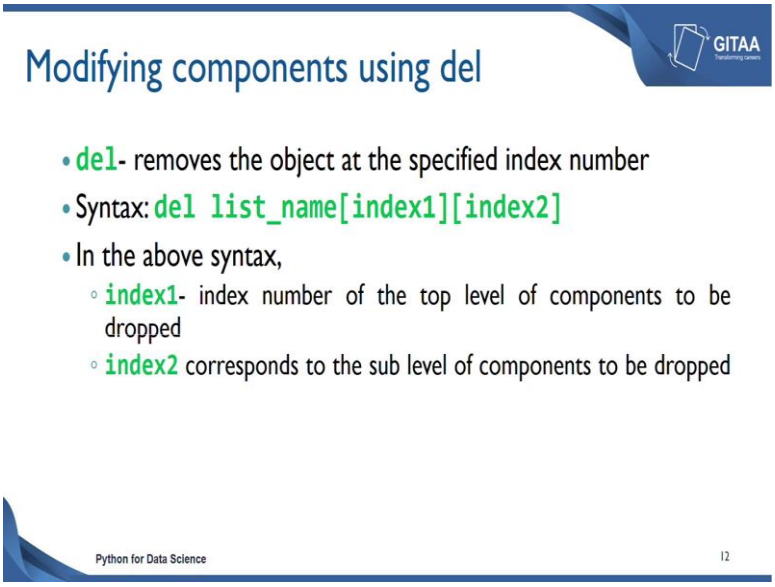

So, del it removes the object at the specified index number, let us look at the syntax. So, if you give del is a key word list name and inside the square brackets you have to

mention the index 1 and the index 2. Index 1, it corresponds to the index number of the top level components of the list which has to be dropped.

Similarly, index two is a index number of the sub level components to be dropped.

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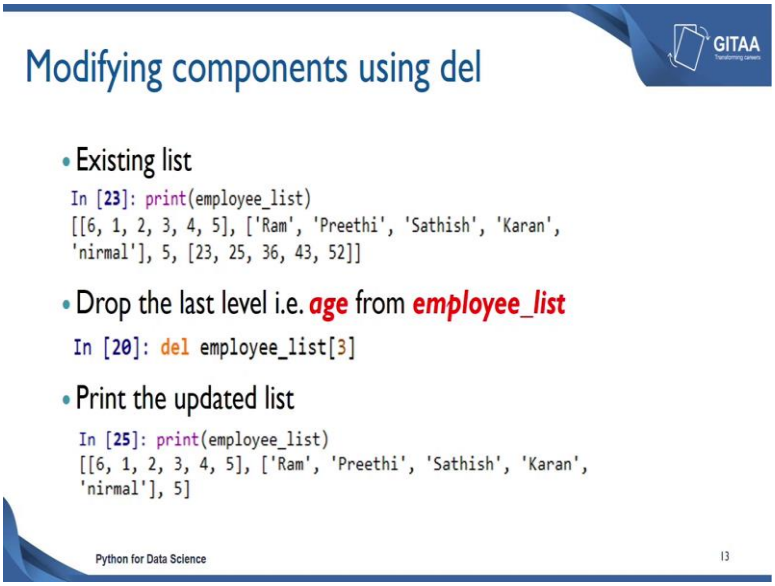

So, this is our existing list. So, if I wanted to drop the last level that is age; id, it is a level 0 and Ram, Preethi, Sathish is the employee_names. So, if the level is 1 and number of employees which is 5 is level 2 and age is at the level 3. So, if I wanted to remove the age from the employee_list so, it will be del employee_list[3] which is basically the index number. So, if you print the updated list, now our age list will be removed from the employee_list next look at how to use the remove option.

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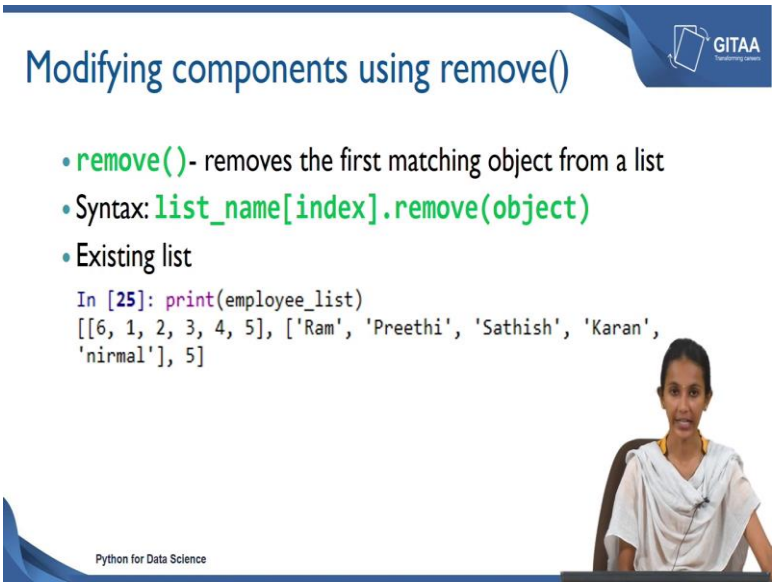

So, remove what it does is it removes a first matching object from a list. So, we will look at the syntax list name inside the square brackets, we have to mention the index number dot remove and inside the parenthesis, we have to specify the object. So, this is our existing lists. So, after we deleted the age.

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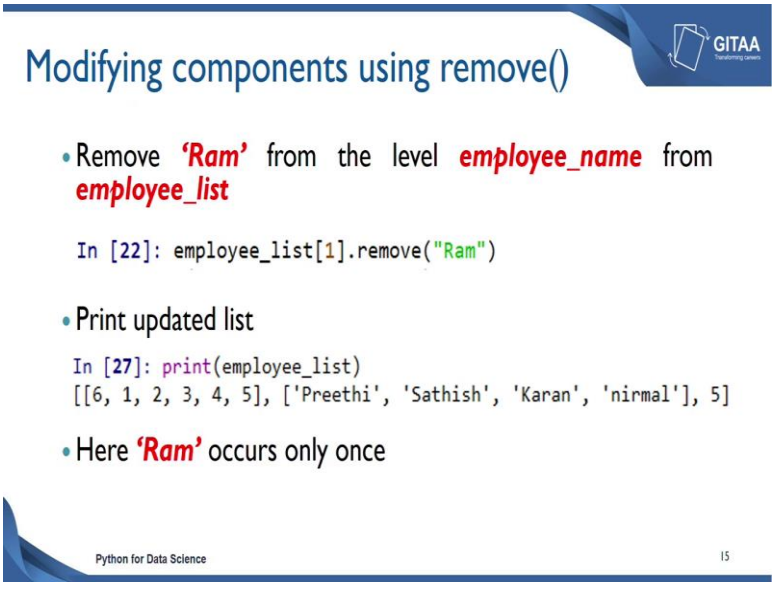

So, let us say if I wanted to remove Ram from the employee_name in the employee_list. So, employee_list so, the index number is one dot remove inside the double quotes Ram.

So, what it does is it searches for the first occurrence of the Ram and then it will be removed from the list.

So, we have only one Ram. So, we have one Preethi, one Sathish, one Karan and one Nirmal. So, if you give dot remove Ram so, it will remove the Ram from the employee_list.

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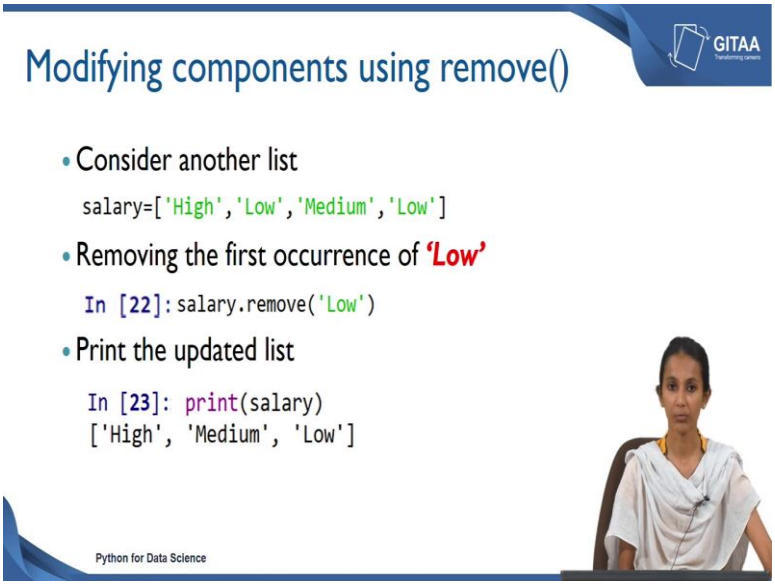

So, when you print the updated list, Ram will be removed from the employee_list. So now you will have 6 ids 6, 1, 2, 3, 4 and 5 and you will have 4 employees which is Preethi, Sathish, Karan, Nirmal and you will have the number of employees is equal to 5 since has ram has occurred once it has been removed.

So, let us consider another list create a list which has salary High, Low, Medium and Low. So, if I wanted to remove the first occurrence of low which is so, High stands for the index number 0, Low stands for the index number 1, Medium stands for a index number 2; again Low stands for the index number 3.

So, if I wanted to remove the first occurrence of low which since in the index position of 1, then if I give salary dot remove low so, it will be removed from the salary list. So, if you print the updated list. So, it returns the value of high, medium and low.

So, the corresponding index position now it will be changed to 0, 1 and 2. Next we will the modify the components using the pop function.

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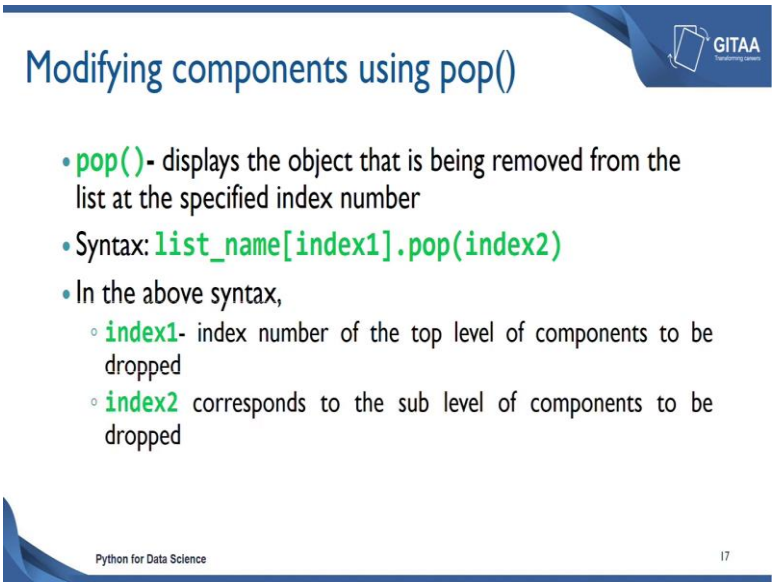

So, pop what it does is it displays the objects that is being removed from the list at the specified index number. So, let us look at the syntax list name index1 dot pop and index2. So, the index1 corresponds to the index numbers of the top level of components to be dropped, index2 it corresponds to the sub level of components to be dropped.

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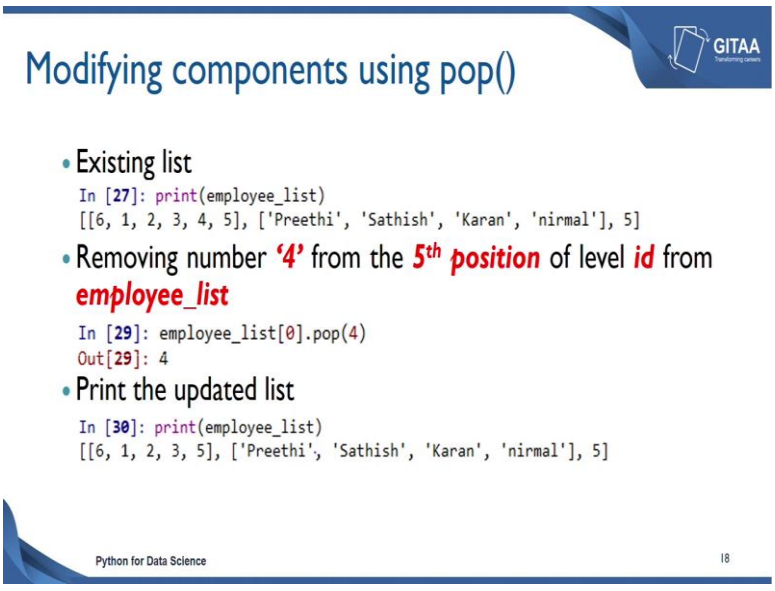

So, this is our existing list. So, I have ids and 4 employees and the number of employees is 5. Let us say if I wanted to remove the fourth id from the fifth position of the employee_list so, in the id.

So, if I give employee_list 0 dot pop 4. So, it pops ups the element in the list is going to be removed so, which is four is going to be removed from the id level. If we print the updated list 6, 1, 2, 3; 4 will be removed from the level id and you will have 4 employee_names Preethi, Sathish, Karan and Nirmal and you will have number of employees is equal to 5.

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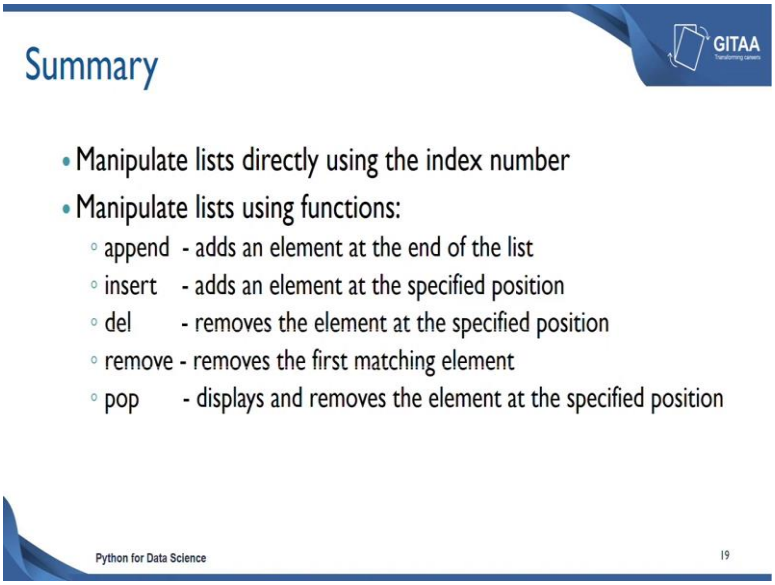

So, let us summarize. So, first we saw how to manipulate the list using the index number and we also saw some of them built in functions. So, first we saw append. So, append it adds an element at the end of the list and also it creates a new list; it is also called as a concatenation of a list. So, next we saw insert. So, if I wanted to add an element at the specified position insert works very well.

Next we saw how to remove the elements. So, there are three ways one is del; first one is del so, it removes a element at the specified position. So, if we give remove, it removes the first matching element from the list. If I give pop it displays and removes element at the specified position of the lists.

Thank you.