Python for Data Science
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Lecture – 11
Sequence Data Part 4

Hello all welcome to the lecture on the sequence data and in this lecture we are going to look at some of the methods that we can apply on any sequential data.

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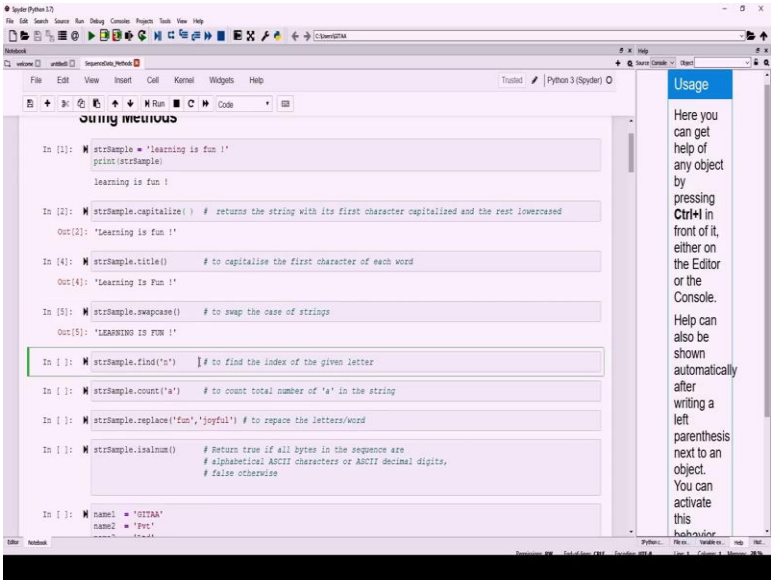

And in this lecture we going to see some of the built in method that we can call on sequential data. So basically Python methods are like a Python function, but it must be called on an object. And Python also has a set of built in methods that you can use on sequential data, but note that the method is going to written new values, but they are not going to change the original data at all. So we are going to look at few examples on how we can call the methods on the given sequential data.

First I am creating a string for strsample which has a string to with that is learning is fun. So let me first print and show you. So, the strsample contains string learning is fun. So let us try to call some of the methods on the string but note here all string method returns new value. We do not change the original string. First we are going to look here is method capitalise and it is going to return the string with the first character capitalise. So let us just try this. So initially it was

learning is fun and lowercase and now it is learning is fun with the upper case L.

Next one is title, basically capitalise the first character of each word. So if you have a sequence of values, if you have a string if you have set of strings in your data and if you want to do some of the operations like this then you can use all these methods on your string. So for example now, if you want to capitalise the first character of each word, then you can use title method in that case. So, it is going to written the values by capitalising the first character alone.

So here all l i and f are capitalized. And thus a method calls what case which is going to swap the case of strings. So if it is a lowercase string then it is going to swap it to make it as uppercase string. So the original string had the learning is fun in all lowercase letters, but it just what all the characters to uppercase. And you can also find the index of a given letter, for example, if you want to particularly know the index of a given character then you can give that inside the find method.

So that should be given the single quote. So the index of n is 4. So if you want to count the total number of particular letter in a given string then you can use the count method. And inside the count method you can just give the desired string value. So that is one because a is present only ones. For example here is there in the word learning only once and using the method replace you will be able to replace any word with the given word.

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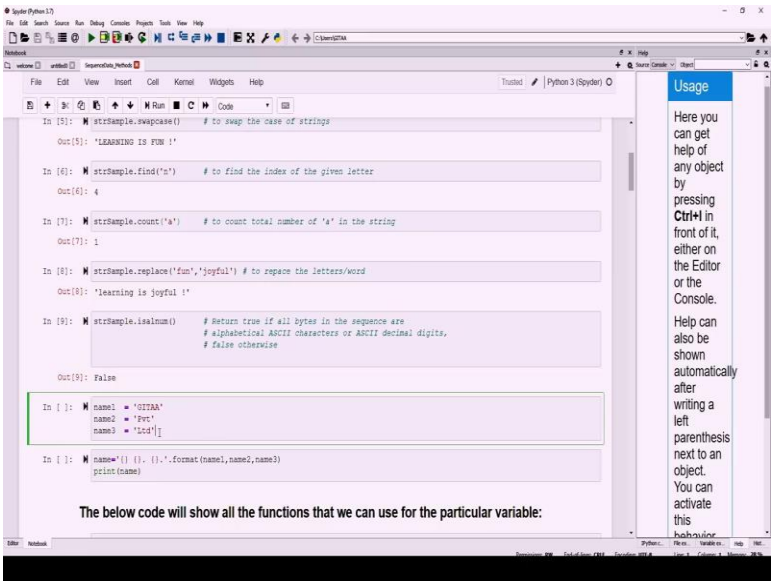

For example, you can apply or you can call that on the string and that is strsample and inside method you can just give string to be searched that is fun. So we are searching for the word fun in the strsample string and I am going to replace fun with joyful. So let me just try this. So you are getting learn is joyful. Instead of getting learn is fun which was the original string. The next one this if you want to check whether all the bytes in the sequence are alphabetical ASCII characters or ASCII decimal digit.

Then you can use the alnum method and it is going to give you a Boolean output whether it is true or false. So it written true if all the guys in the sequence of the alphabetical ASCII characters or ASCII decimal digits otherwise it is going to written false. Because in our string not all the bytes in the sequence are as a alphabetical ASCII or ASCII decimal digits. So now I am going to show you something called string formatting.

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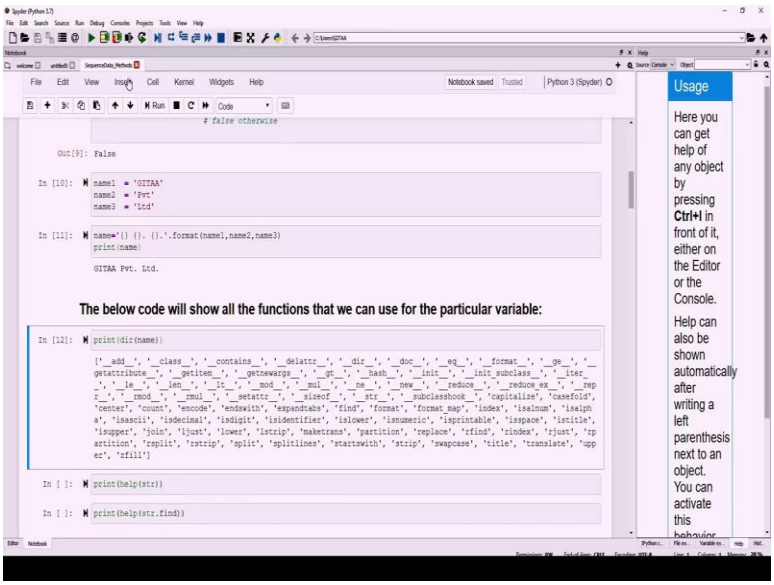

So for that example, I am going to create three variables name one is equal to Geeta name 2 is equal to Private and name three is equal to Limited. Using a method I am just going to format the output in a way that I want to read the output or in a way I want to store any value name check. So format is one of the string formatting methods in Python 3 and which allows multiple substitutions and value formatting.

And this method also let us concatenate elements within string thorough a positional formatting. And the format as work by putting in one or more replacement, fields and placeholders defined by a pair of curly braces like how I have given here it is called placeholders because we are going to; so the value that we wish to put into the placeholders and concatenate with the strings and concatenate with the string pass the parameters into the format function.

So, here name1 name2 name3 are the parameters for the format function, for example. I want to basically print it as Geeta Private dot Limited dot. So what we are giving here is; I will just first basically created some placeholders for few values that I am going to put inside that. So, using the format method I am giving those values that I wish to put inside the placeholder. So, name1 will go to the first place holder and the name2 will go to the second and name3 will go to the third one.

And I was a given what needs to be there after that particular value I have given dots so it is

going to be present with a period as well. So for example, the final name would be GITAA Private dot Limited. So this is how we format the output of any given object or you can store a particular value to an object using the string formatting. So these are few examples, so these are few methods that we can call on any string and if you want to look or if you want to know more about The methods that you can perform on a string then the below code will show all the functions that we can use for the particular variable.

For example I have created a variable called name a few give dir of name and I am also giving the print statement outside to that. I am just going to print out all the values that I am getting from the function dir. So, it is going to give you one list of methods and functions that can be applied on the particular variable name. If you say he was a used some of the methods title and replace all those swapcase and all those have already used.

And if you want to look for the help on given data type for example, str if you want to see what are the functions that you can perform on a string then you can use the help of str. Str represent string and string is one of the data type in Python that you can work with.

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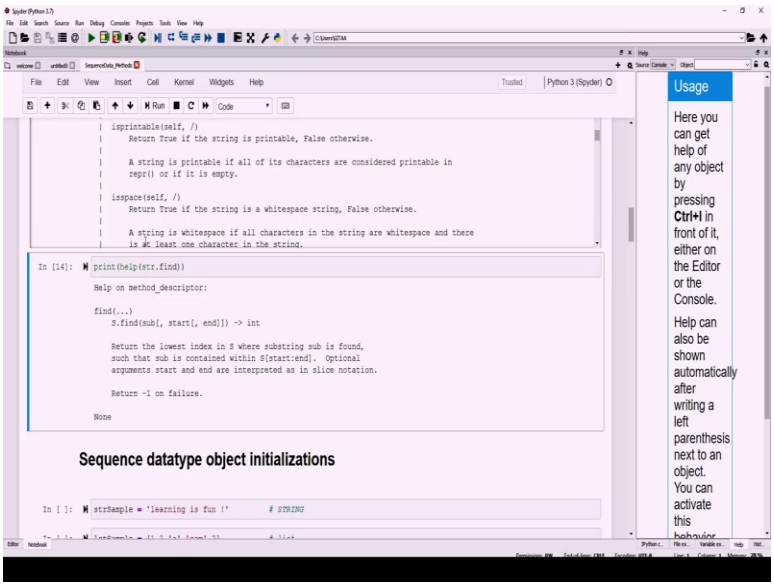

For example, it shows you the documentation on how you can create a string and as well as what is a method or what are the functions that you can perform on the string. So this will be very helpful and it will come in handy whenever you want to explore more on the operations that you

can perform on a string. So for example, if you want to specifically look out for any function that can be applied on a string then you can as will use that with the same command instead of just giving help of str you can just give help of str dot find.

And find the source of the method that can be applied on a string so that gives you the method descriptor. So basically find is a method and that gives you work syntax on how to use the find function and it was a give you what it returns. So this will give you overall idea about what are the functions that you can use or how to use the function in specific to the requirement.

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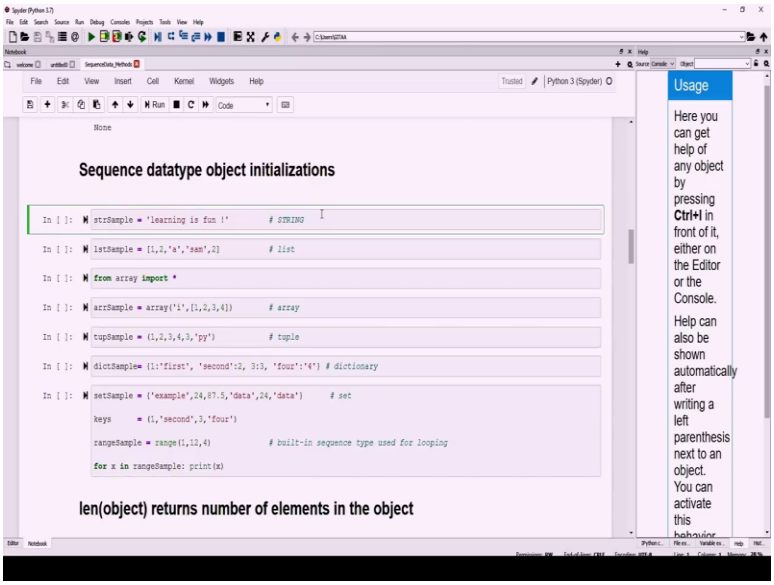

We will be using some of the methods that can be explicitly call on a given sequential data or we are also going to look at some of the methods that is common across some of the sequential data. In that case I need to create sequential data in order to perform some methods on it. So we have already seen how to create strings, lists, tuples, sets, dictionary and range in the previous videos and I am just going to pull out the same examples to execute that so that I can perform some of the methods on it.

So let me just run strsample to recall that we are created for example, which does contains the string learning is fun. And we were also created list something which has values 1, 2, a, sam, 2 and will also creating an array sample which has values 1, 2, 3, 4 of integer data type and also tuple which has more value and dictionary as well as sets and range.

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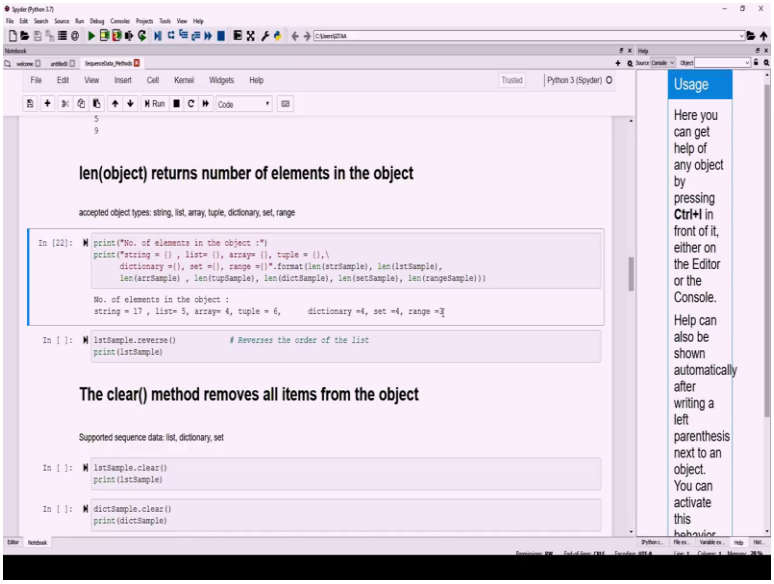

So we are going to first look at a method call len that is going to return the number of elements in the object and I have given the accepted object type that is it can be applied on string, array, tuple, dictionary, set or range. So it can be applied in all the sequential data that will cover in the previous lectures. So now if you can make it here, I am just using the print statement which describes the number of elements in the object.

So that is going been to the title of the output and I am using the string formatting here. I have just given some of the placeholders. So that I can put the output inside that, so instead of basically giving or instead of checking the length of each of the sequential data that I am just going to put that in a single by using the string formatting method. And what I have given here is inside the format I have just given len of strsample which is going to return the total number of elements that particular string and similarly for all the sequential data that I have.

So let us just print and see. So this is how the output will look like if this is the number of elements in the object and it has equal to 17 and it describes that 17 substrings are there in the string and other five elements in list and four elements in array 6 elements and tubal and 4 in dictionary and 4 in set and 3 in range. So, this gives you an overall idea about how len function works and how it can be applied on any sequential data.

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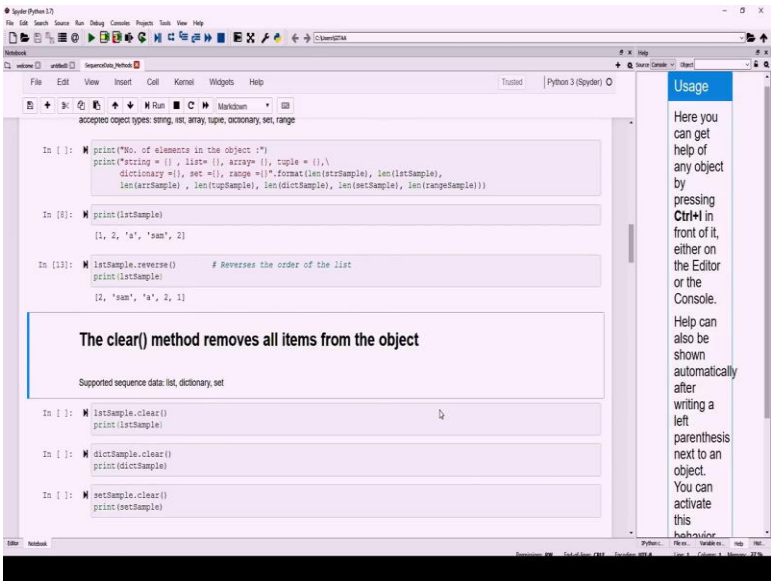

So first let me just show you what is there under the list. So I have 1, 2, a, sam, 2. So, if you want to reverse the order of the list than you can perform reverse method on a list and it is going to order the elements in a reverse order. The next is the clear method helps us remove all items from the object and supported sequence data are list, dictionary and set. So, you can perform the clear method only in list, dictionary and set.

So, let us see an example of how we can use that on a list, dictionary and set. So I am just using clear method and then printing lstsample. So you are getting empty list since all the items or all the elements from list has been removed. The next one is clearing the items from dictionary sample and I am also printing the dictionary sample. So you are just getting an empty dictionary since all items from the dictionary have been removed.

The next one clearing the items from the setsamples, so you are just getting an empty set. So this will be helpful when you want to remove all the items from the object in one shot. So, now since they have already cleared all the elements from the object let me just restart my Kernel. So let me just rerun this so, that I can perform other operations on the sequential data.

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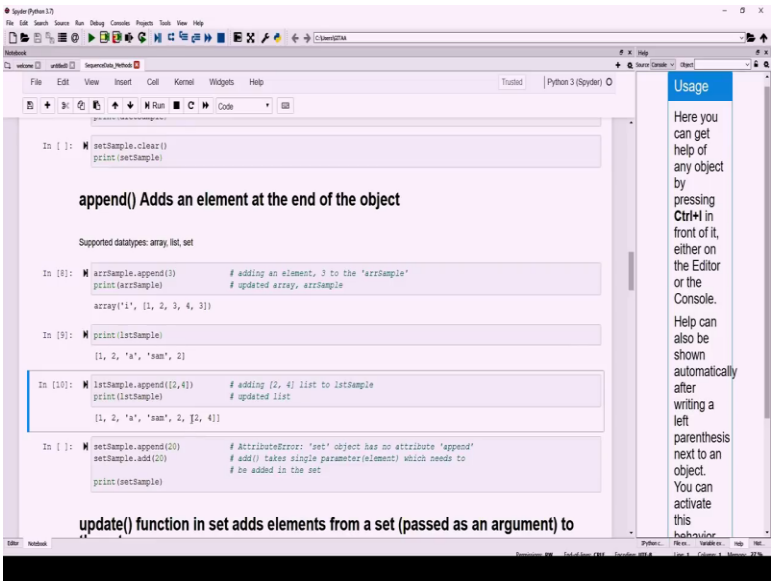

So now I am coming back to another method is called append. Now we have been seen how to clear the elements from an object right. Now let us see how to add an element at the object and the method call append that used to add an element at the end of the object. So the supported data types of array, list in set and you can use this append on any array, list or set. I am just giving the desired value that needs to be appended at the end of an object.

So I am just adding 3 to the array sample and just printing the same. Our array contains only the values 1, 2, 3, 4 and now we get added and now the new values get added at the last. So the next thing I am going to do so is am going to happen some of the values to the existing list lissample. So before doing that I just print what is there under the lissample that is 1, 2, a, sam, 2 I am just going to add a list to the lissample.

The new list contains 2, 4 I am just going to append this using append method. I am also printing that so if you can see here this was the original list and now a new list has been appended to the existing list. The values have not got added as an element, but it has been added as list itself. So the next thing is appending in element to the setsample.

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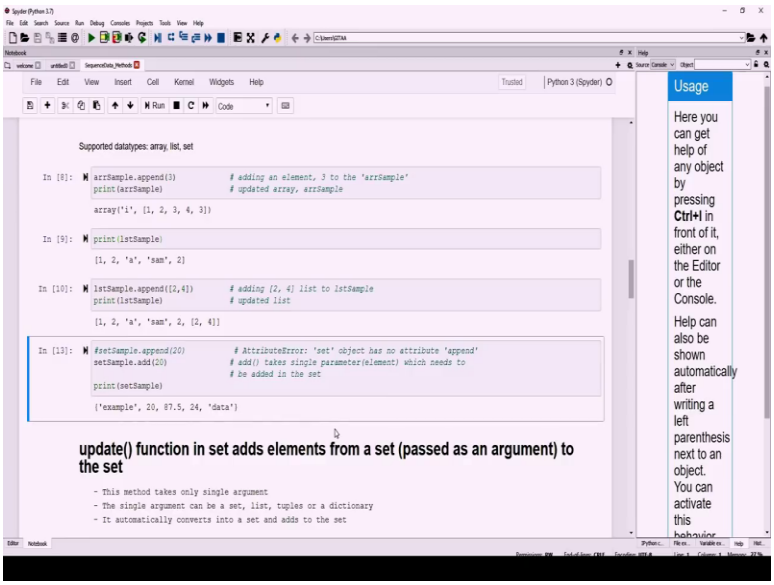

But if you do that, it will throw an error saying attribute error saying set object has no attribute append. You cannot append value to the existing set that you created but you can as well perform the same using the add method. So instead of using append have just added the method called add with the same value that is 20. Let me just in this and see the 20 value has been added to the set and has been added as a second element.

Since the set does not hold any particular order to any of the elements inside it so it get added as a second element. And if you can note here given only a single value because add takes single parameter which needs to be added in the set, it cannot take multiple values at a time. So you will be able to add only one value at a time. So we have seen a add an element at the end of the object.

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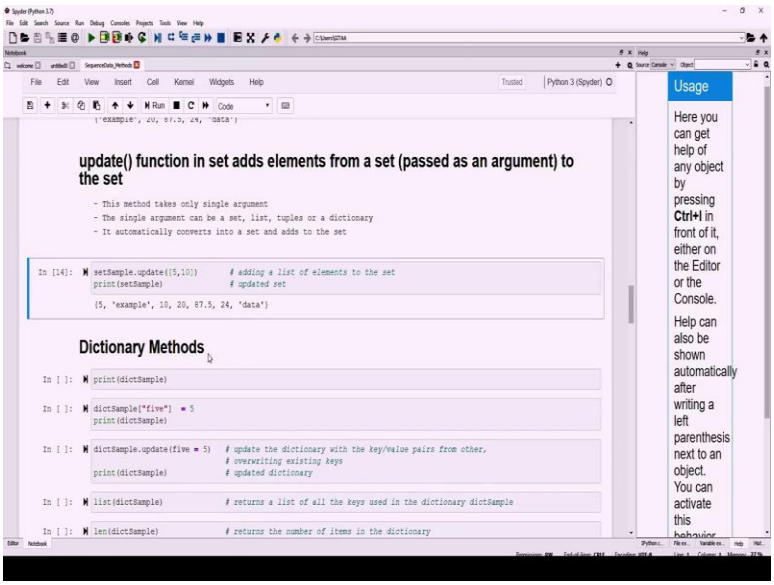

Next thing that we are going to see here is the update method that is a method that can be used in set which is going to add elements from a set because here we are not able to add multiple values at a time. So you can do that as well using the update function. So the update functions in a set at elements from a set which can be passed as an argument to the set. And this method the update method takes only single argument and the argument can be set, tuples or a dictionary.

So you can add values as set, list, tuples or a dictionary. And what does means it automatically converts into a set and then at that particular list of values for that particular set to the existing set. So, let just try an example. So I am using the update method on a set but I am passing the values as a list which has values 5, 10. So, now the 5, 10 has been added to the existing set 5 and 10 has been added and we also printed the updated set.

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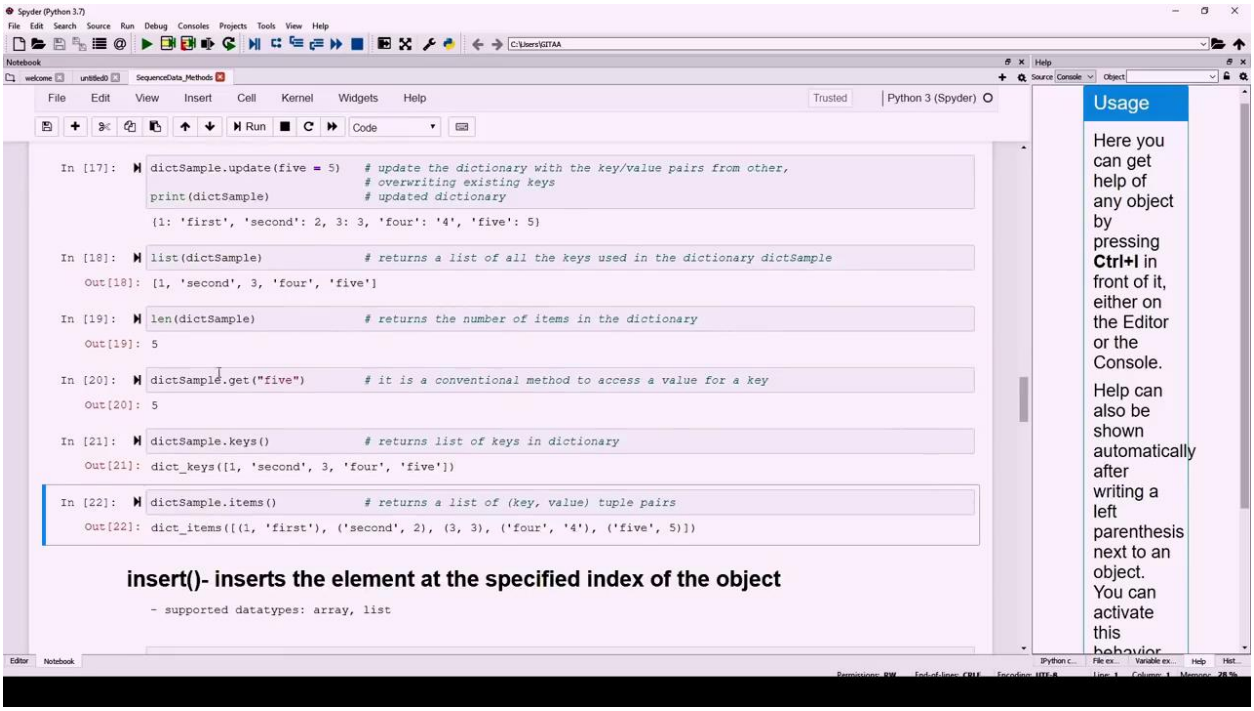

So the next thing that we are going to see here is some of the method that can be applied on a dictionary because as we know dictionary is a container that can hold a non sequential data. We cannot perform the same methods on the similar way but can we apply but in a different way. So began to look at the seperately like what are the methods that we can use on a dictionary and how we can apply that.

So let just print what we have it under the sample dictionary that is this. We have few keys and we also have few values associated with each keys. And the if you want to create a new set of key-value pair, for example, I am just creating a new key that a stick sample of 5. That is 5 is going to be created as a new key and I am just updating the value of square so that a new value will be associated with the key 5.

So, this is how we update key value pair to the existing dictionary. So, now the dictionary gets updated with the latest key value pair that is 5 in string as well as to the corresponding value 5. And you can perform that using the update method and the argument should be passed an and argument should be passed as a dictionary like how we have done it in set or you can as well give the set of values as list set dictionary.

So, now I am giving the values as dictionary because I am updating a key-value pair on a dictionary. So we are updating the dictionary with the key value pairs that is 5 is equal to 5. So, it is just going to do the same thing but two different ways. Here I have just you have just created a new key value pair by just using the equal to operator and by creating a new key using square braces and here I am just using a method to do the same.

But once you created the dictionary you will be interested in seeing the list of keys that are used in your dictionary or list of keys that are present in the current dictionary. So if you use the list it is going to give you all the keys from your dictionary. And if you want to basically know the number of items in your dictionary, then you can just use the same len function which we were already used. Basically, we have 5 items in your in our dictionary.

And there is also a conventional method to access a value for a given key. So, for example, if you know a particular key then if you just want to access the particular and you just want to access the corresponding value of a then you get that using the method called get and have to just given the key of interest. So the value corresponding to the 5 key is the value of 5 and if you want to return all the keys in a dictionary, then you can also use the keys method which is going to give you dict keys where it just list all the keys available in your dictionary which is as similar to what we got from the list function as well.

And basically if you want to get the list of key value to tuple pairs and then you can get that from items method where is going to give you each key value pair as tuple and going to list on all the key value pairs and this is how we can call some of the methods on a dictionary.

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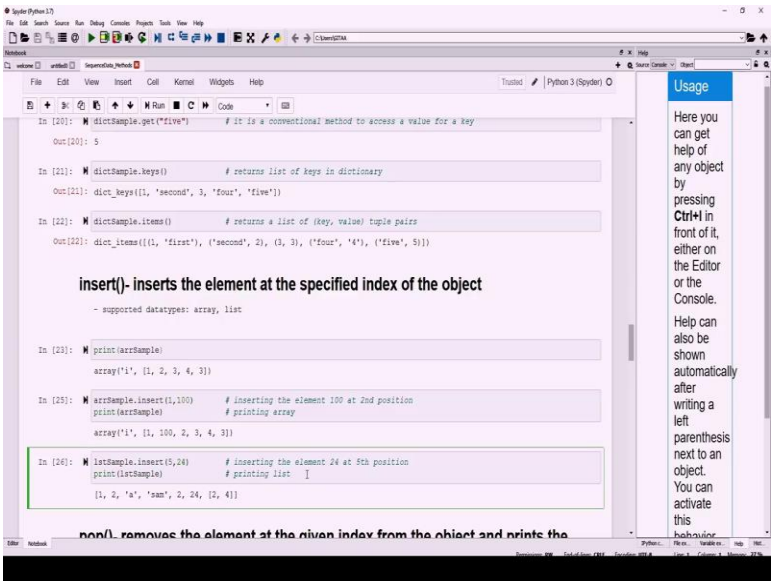

Next thing we are going to see here is the insert method which would be very helpful when we want to add or when we want to insert the element at the specific index of the object and it can be supported in the following data types array and the lists. And so I am just going to use one example on array. So I am just printing what is there and updated array that we have now it has 1, 2, 3, 4 and 3. So, to basically insert the element at the specified index of an object then you can use the index method.

And the inside that you just need to given two arguments. The first argument should be the position to which you want to add a new element and second argument should be the element that should be added. So I am inserting an element 100 at the second position to an array to an existing are that is array, sample and I am also printing array sample. So this was the original array 1, 2, 3, 4, 3. But now an element 100 has been added at the second position since the index this one and now other values remains the same.

So this is how we can add the element at the given index, I am also doing the same thing on a list just to see how the insert method works on a list. So, if you can see here, I am inserting the element 24 at the fifth position. Inserting 24 elements at the fifth position so fifth position is just before the value 2, 4. So this how we called insert method on a list where we can basically specify the index to which we want to add the element. So now we have seen how to insert an element at the given position.

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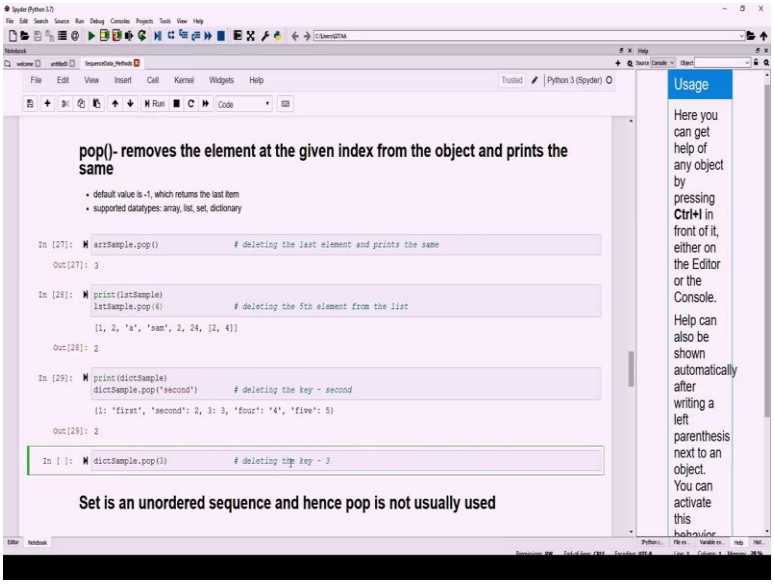

So, in that case we should know how to remove the element at the given index. So on that note pop method is being used to remove the elements at the given index from the object and as well as it prints the same. So you can use the pop method if you want to remove a particular element from your object and then if you want to just cross verify whether whatever element other removing from the object is actually correct or not.

So in that case we can use scope and if you do not give anything inside the pop method when you are calling that on any object then it is automatically going to remove the last element from the object that is the default value is -1 which returns the last element. And it is supported across array, list, set and dictionary sequential data. And it was and it is supported across array, list, set and dictionary containers.

I am just using the pop method on the array sample which is going to delete the last element is going to print the same. If you can recall the array sample has the as the set of values where the last value is 3 and when I use the pop function on it, it just returns a value 3 because the value 3 got removed from the array sample but whereas if you want to remove a particular elements, then you can give that inside the pop method.

So this is the original I have an if I call the pop method on the list and if you specify the position

4 that is this going to remove the fifth element which corresponds to the fourth index which is nothing but the element 2. So you will be sure that for the given index what is the value that gets removed. So that is one advantage of using the pop method. First thing is I am trying to remove key called second from the dictionary sample.

So, before removing that I have printed what is there under the dictionary sample. So I have key called second. So I am going to use that as the argument inside the pop method. So that it is going to remove the value to corresponding to the key second. Similarly you can give the key 3 that the value corresponding to the key 3 will also get removed. This can be useful whenever you are basically dealing with any data cleaning.

And if you are very particular about what is integer then in that case you can use the pop method. But one thing to note here is the pop method is not usually used on a set because we know that set is an unordered sequence and hence it is not going to remove any elements or any items from the set or with any given index. So we cannot perform that on a set.

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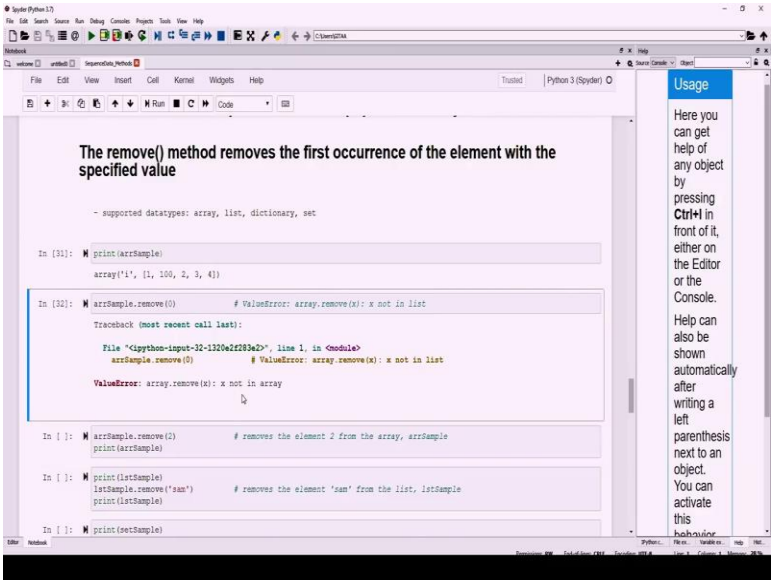

And there is one more way you can remove the elements or remove the items from the given object that is using remove method. And remove method remove the first occurrence of the element with the specified value. So, if you have multiple accounts of the particular element then it is going to remove only the first occurrence of it. So it can be supported across the data type

called array, list, dictionary and set.

So the first example is on a dictionary. So the sample has 100, 2, 3, 4 as value and I am going to use the remove method on the array and given the value 3 it says value error because I have given a value which is not in the range at all because it does not have the value called zero so it is going to give me a value error. But if you give a value which is already there in the array, then it is going to remove that particular element from the existing array now the value to get removed from array sample.

Similarly you can as well perform that on a list to this was the original list that we had a printed it before and then I am removing sam from the existing list lstsample. So and then I just printing the lstsample and if you can see the output the sam element has been removed from the existing list. Let just I am trying to remove a value called 57 from the setsample and it gives the 3 and gives an error saying key error 57.

So the 57 is not one of the values of the setsample. It is giving the error saying key error 57. But if you want to remove a particular element, but if you are not sure whether that is contained in the set or not. I just want to remove it then you can use the discard method where the set remains unchanged if the element pass to discard method does not exist. For example, the setsample does not contain any element called 57.

But I am using discard function here. It is not going to give me a key error saying it is not part of the setsample it is just going to remain as it is deleting nothing removing nothing from this existing sample. This is how we can remove an element or an item from the object using the remove method.

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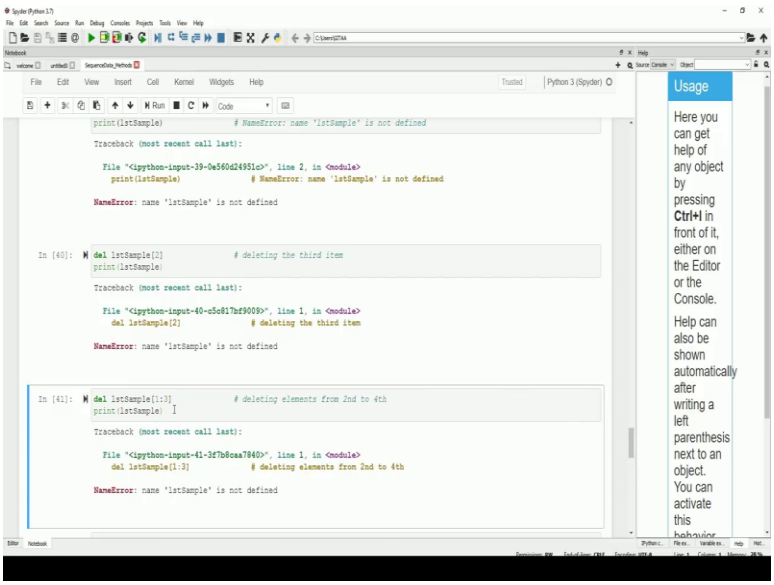

For example, if you want to delete the entire object of any data type then you can use the del method and the syntax to be used this del and followed by the objects name. So here I am just deleting the setsample using the del key word when you print it is going to give you an error saying nameerror name setsample is not defined because I have already deleted the object entire object from the setsample so that if I am getting this.

This can be applied on any data I am just applying on an array. Similarly on a list but you can as well delete a particular element from the list by giving the index. Since I have already deleted all the values it is just going to give me an error saying it is not defined. And you can I still perform or you can delete the sequence of elements by giving the sequence of index. Here I am trying to remove the element that corresponds to the index 1 to 3.

This is how we give but if you want to remove all the elements from the list then as well as like you can do that like how we access all the elements from the list that is using the colon operator inside the square bracket. If you do this all the elements from your list will get deleted and this is an example on how to delete the object dictionary.

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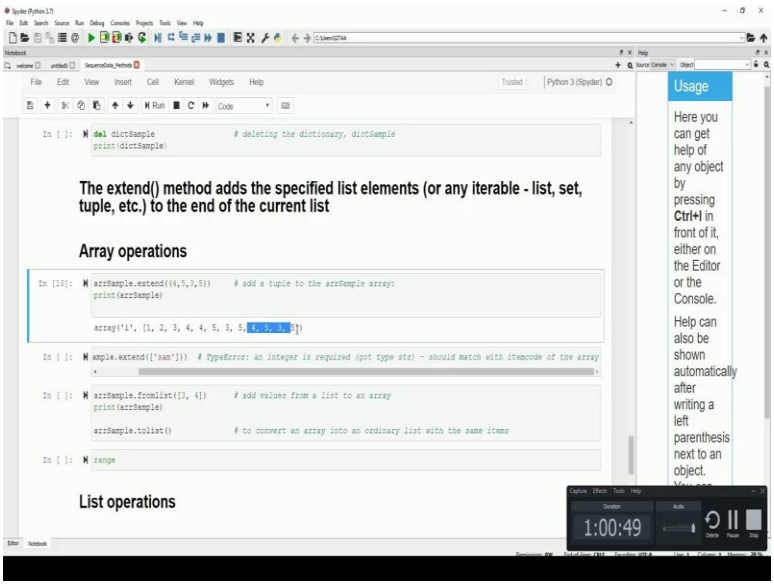

So this is how we perform del operator on any object. So we are going to look at another method call extend which is a method that adds a specified list elements. It need not be of only list elements. It can be any attribute. For example it can be set, tuple and etcetera and it is going to add the specified list of elements at the end of the current list. For example I am just going to use a extend method only on an array sample I am going to pass the value as the tuple.

Why I am saying that you because I am resting enclosing all the values inside the parenthesis so it just trying to add a new tuple to the existing array. The existing array was only till 5. 1, 2, 3, 4, 4, 5, 3, 5 and the set of values are tuple have been added at the end of the current array. If you are trying to give string value it is going to throw you an error saying type error because an integer is required and it should match with the item code of the array.

So here I am just going to add values from list to an array. So I have a method call from list so that you can just give a sequence of values 3, 4 and if you are calling that on an array, then you are going to add the values from the list to an existing array. And this will be the output so you have added 3, 4 as one of the elements of the array. So array sample is of type array and if you want to convert an array into an ordinary list this with the same items that is already there in array.

Then you can use the two list method on the array, this converts the array to list. So if you see

here the output was includes inside array function, but now all the values are enclosed inside a array function now all function are enclosed inside a square brackets.

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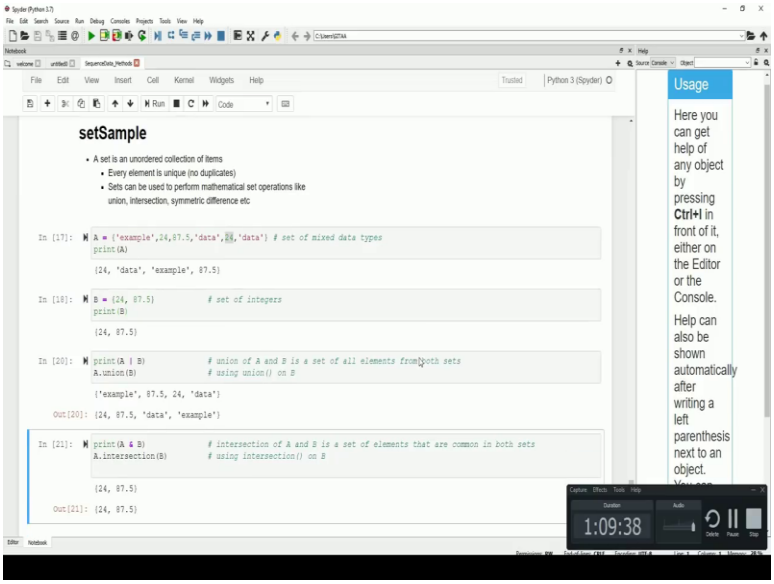

Next we are going to look at some of the operations that can be performed on set. And as we know that a set is an unordered collection of items. So every element is unique inside a set that we can create a set if you want to have or if you want to store values which are of only unique or we can just convert any object to a set. If you want to fetch or if you want to have only the unique elements inside it and set can be used to perform some of the mathematical set operations like union, intersection, symmetric difference etcetera.

Let me just take you through an example on each of these. So, I have a set called A which have some values example 24, 87.5, data, 24, data as the previous set which we have already have sam we renamed as A. And you can say have two, 24 here but it has only one 24 when I printed out so it is going to give you the unique values, but it can contain a set of mixed data type. You have another set called B which was like a subset from A.

So I have 2 sets now A and B so let me speak through an example how you can perform the union operation using this tool set. I am just using A or B operation. So which is to check the union of A and B, and it is going to return a set of all elements from both the sets and you can either perform it using the union operation as well. We can just use A dot union of B that is also

going to written all the elements from both the sets.

So, if you can see here, it has all the values from A as well as B but it is going to written only once even if it is repeating in A and B. The next thing is checking the intersection of A and B which is going to written a set of elements that are common in both the sets and you can perform that by placing the and operator inside 2 sets or you can use the operation intersection and A dot intersection B and that written only the common elements across both sets A and B.

So, these are some of the mathematical set operations that we can perform on sets that we have created. So now we come to the end of the script. In this lecture we have seen some of the method that we can call on a sequential data as well as a non sequential data. And he was the same few examples on how it works on each sequential data and also seen how it works on sequential data as well. Thank you.