LISTS PART 2: MANIPULATION

What if you wanted to buy something say oil, you wanted to buy oil, definitely oil is not even a single drop of oil is there in your house and you need to buy oil for sure even if coffee is not available sugar is not available you are ok with it but you definitely want oil so you want oil to be pushed to the first part of the list so how would you do that? There is a method available for that as well that is called as insert method that is you insert at the given position, you can specify at position you need to insert the item so let me say bread is needed for me then i want oil so and please note that an indexing starts from here this is what called as indexing so i will demonstrate that first then let us go into this thing of inserting the items at some specific positions ok so if i would say shopping of one this is what you called as an index at this list shopping at index one what is the element present? So index is something like a position holder something like this so by saying one what do you expect do you expect bread would be printed? Right? Let us see what happens, see coffee is taken that is the second item i had asked one its printing second item instead of the first item so let me try zero, shopping of zero let me try see it is now showing the first item so what do you understand from this? Computers count in a different way exactly computers count in a different way the counting starts from zero, human start counting from one we will say one two three four, four items are present the computers will count it as zero one two three. What is the third item? If we ask the human he will say one two three third item sugar, but computer will say zero one two three third item curd so i guess you understand the difference between the computers counting and the humans counting it differs by one so if you need the second item you should say two minus one, at the index one so indexing, so this is what you call as indexing, index is nothing like a position holder so this is position zero, position one, position two position three according to the computer so this is how the individual elements can be accessed, individual element can be accessed using indexes indices index using that you can access this elements ok so is there we had printed it using some way already using the for loop so using this indexing mechanism can be printed using our range function which we are used in numbers where is that is another way of printing the elements of a list slightly around about way compare to the simpler way we had done earlier but this is a recap for your range functionality of previous weeks as well so let us see this way of printing each element in the list let us see it for i in range how many elements are there in our list one two there four for computer it is zero one two three range functionality starts counting from zero we want to count till three so what should be the number given inside it should be four because this particular number is when it reach four it will stop counting so it will not consider four so till three only it will consider, that what we too wanted so we will set for i in range four print i will say shopping of i please observe the square bracket are being used here shopping of i ok, see same thing bread coffee sugar and curd this is printed so this is slightly roundabout way simpler way is for item in sorry i have to give the space here it's very there is a change in colour which is not visible for item in the list name is shopping, shopping print item see we got the same thing so this are two different ways by which you can print the items of the list one after the other just like how we write in a piece of paper, for one we just by using a

variable inside a list other was using the indices index so when will the index will be highly useful is if you want to extract only just few elements in that case indexes will be highly useful for example i had given you another instance like students information eight in the beginning i have given you an example of students information in that case let us assume that every student has role number or id number whatever you can say so they have arranged in that order based on their id number data has been arranged and stored so in that case if you want to extract the details, if you want to extract the name of the student whose id number is twenty you can use these thing like students of twenty so in our we have four items i want to extract the second item so for second i should say i should say two minus one so index is one shopping of one this extracts the second item so in our in that case i felt student of id minus one or id in case if you start counting if you say in zero position you have something like that name let us say heading name has been that's how we generally write so let me say name then you start writing student one student two and so on so this is generally write right? So let us assume in this way only our list has stored items so at zero index we will have this thing name which sort of a header so s1 student whose id number is one will be at index one, student at id number two will be at index two this is one way by which you can manage the difference between a computer and a human spouting. Just an idea i have given you can try implementing this student information list in any way as you wish so in that cases when you want this particular specific caleman to be accessed in that case the indexing will come highly handy let me say as i now given that i have said about indexing i will come back to the thing that i had said already inserting your items at random position that is at a given specified position see for example i remember that i need oil definitely bread definitely i need next priority is for me is oil coffee may go in a lower priority that is even as coffee is not available i will not be that sad but oil is definitely needed something like that let us assume this is the scenario so i want bread oil coffee sugar curd in this order i want my list to be so append as i had shown you already if you would see i had used terminology i have used append so i have used the up arrows as we have said already up arrow is used for history look up in case you want to go down you can use the down arrows as well up arrow is for going to the precious command if you want to move one down just assume that it is like a history look up is nothing but like a ladder you can climb up and down the ladder to see what you have done in the past ok so i had appended one item let me say i wanted shampoo, i append shampoo so i have appended it because of it i want to print the shopping item let me print it see shampoo got added at the end so is this the only way by which we can do, can we change the ordering i want it as bread oil coffee and so on i wanted to be like this so how will i insert it for that we have a command called insert let us see it, what this command specifically does this? If you give position and say insert the item it will insert the item into that position so it will shift the other items automatically see how flexible it is, if you are if you had realised something if you are using a variables like i1 i2 i3 for different items and if you want to change the priority just assume how much of work you have to do, i1 i2 you had made coffee and you wanted i2 to be oil and i3 to be coffee if you make i3 equals to coffee then sugar value will be lost so you have to move it to the next next next so how much of shifting you have to do man all this is neatly handed by python data structure mainly the list. So let us see inserting the specified position let me insert shopping.insert is the functionality insert you need to give the see some help was given index and object is says so its nothing

but object is nothing but a position as i said so position and whole depth not position exactly as per humans position that is one less you need to give and then the object whatever you want to insert into your list object is the general terminology python users items object items anything you can say so this is the method by which you do you have to give the position first so i wanted it to be the second position as per humans so it must be index two minus one that is one, one i need to insert item i say oil i want to insert oil in this basket so i had given it, it could have got inserted and let us check that as well so see it got inserted correct oil coffee sugar curd shampoo so this as per my priorities see how handy python lists are there is much more functionalities that are available in this let us see them as and when the need comes also we will give you a hint on whole things that we may be using frequently and as and when the need comes you can check out our video we will explain also you can check out the python documentation there are a lot of functionalities available in this list let us see something which may use frequently so this list specifically has stink items see bread oil coffee all this are distinct items but sometimes some lists may have repetitions' for example consider census data something like that you have list of all ages of people living in a city something like that so there will be definitely repetitions right? you cannot say that if a person is thirty years old is living in the city no other person of thirty years old should live in that city definitely there will be repetitions so in that case you may be interested in finding how many number of people of specified age group is present in that city for that we have a functionality called count let us create that data set from random data set we say ages if the name of our list let me just say twelve, twenty three, thirty four, forty two, fifteen, eighty seven, twelve, sixteen, twenty five, twenty three, eighty two, fifty seven, seven, three, two, three, one, twenty ok. just assume that this is the list of ages of different people so we had created a list we have a data so in this definitely there are few repetitions as you could see twelve, twelve here somewhere else could also be same so in that case i want to see how many people of age twenty five live in this city? So how will i do that? I have a functionality called count that is been provided by python lists it is use that ages is the name of the list dot count is the function inside it you need to give what is the value? What is the object? What is the item for which you want to see, i said the age is twenty five this what i want to check so i will say twenty five see it says one so basically in this list just one time the number twenty five occurs that is one person of age twenty five is there in our list. If i say ages of count of twelve let me say see it shows two because we have twelve here as well as here see we have twice what if we given age which is not present in our list for example let me say seventy i don't think there is a seventy year old person in this list, see it says zero so it will return zero which is the element which you want to check in the list, if you use this functionality it will take this element check prove then this how many number of times this element is present in the list and it will return that answer, if it is not present it will return zero see how neat it is this functionality will be useful in one of our upcoming exercises that is why i have taken the data set where there will be repetitions see how many elements are there in this list? I want to know this. Can you manually count it? One two three four five six oh i am getting very tired shhh its seems too long it's looking like Nile river something like that i don't feel like i want to count it is there a way i can ask python to count and tell me, off course yes! There is the way that's why you could see my tone was not very sorrow full something like that i am joyful because there is a way by which i can count how many number of items are there in

this list? This list is very handy especially in case when we have a lot of data items for example let us say the student data i said list of students in our online course see there are thousands and thousands of students so manually counting over each name and then saying that these many students are present is really difficult checking in our shopping list i have created a really small shopping list just with five items so it was easier to count but see even ages data the sample just i said just it is a city but this is would probably be in a street, this data could probably belong to a street only. If you take a people of all ages in a city it will be really much longer than this even this we cannot manage manually though real world data may be grow really really big in that case we have to make use of some functionalities of python to make our life simpler so once such functionality helps us find the length of the that is what it called as length the terminology uses length that is how many number of elements are present in this list? We can check that the way is you have to say Len that is the functionality length of the name of the list see ages it says eighteen there are eighteen elements in this items and let us just if you are sort of is it really a eighteen i need to count it, let us test with the something that we know shopping list, shopping list has five items as i have said six oh! Did i had another yeah i added oil yeah fine there are six items see it counts properly even i made a mistakes humans can make a mistake but computer will not make mistakes so this is the functionality that come handy in many situations so please make a note of it this is how you find the length of the lists so in that way where we can use the range functionality and indexing facility and print the elements in a list for example let us see ok so i will look up the history see that time i had just four items in my list, i had just four items in my list ok, see it is printing just four, now i say print shopping, if i just change it here i will not look up further print shopping if i would say print shopping see there are more than five items so if you manually want to give an number it is difficult so in this case you ant python to intelligently alter the number as and when your list grows or shrinks so let us use the length function here so length of shopping, shopping i need to close it ok, see now you got all the items so what it does? It will find the length and it will iterate that many number of times so it will go that many number of steps so this is the list the length is six so it will go and take this element, this element this element and every element will be covered so by using this length functionality and loops you can iterate ever each item in the list this is one way further simpler way is as i said is for item in shopping this is really a simpler way because you may not even think about the range, length and all these things so for each item in shopping as long as there are items in this list keep printing just as how you give the instruction in English with some modification you can do it in python really an easy way ok.