AREA CALCULATION: DONT MEASURE 03

So first of all let me give you brief idea of what images are, so an image consists of matrix of pixels. A pixel is basically a colour and a colour id defined by mainly three attributes. I repeat an image is basically a matrix it is a matrix of pixels and a pixel is basically a colour. A colour is defined by mainly three attributes. And the attributes are amount of red present in the colour, amount of blue present in the colour and amount of green present in the colour. Yes the RGB values they define a colour so whatever colour you choose they would be having some amount of red, green and blue in them. And that's what makes a new colour. I repeat every colour is defined by three attributes, amount of red, amount of green and amount of blue present in that particular colour there are only three primary colours and those are red blue and green and if you mix them in some particular quantities and that makes a new colour so this is what RGB values are all about and every colour is associated with some RGB values. So as you see there are some examples here RGB value of white is basically two fifty five, two fifty five, two fifty five. That means it have two fifty five amount of red, two fifty five amount of green and two fifty five amount of blue in it and RGB value of black is zero, zero, zero. So it has zero amount of red, zero amount of green and zero amount of blue in it. So now let us try to implement a program based on this so that you can get the clear cut idea of how to represent an image and how to assign unique RGB values to an image so let us do that. So first of all i will just show you how can you represent an image here so we will have numpy library here first i will do import numpy as np after that i should also import pil yes i should also import pil and hope that you are already aware of pil and you have seen the previous lectures on image processing so i will just write from pil import image, after that what should we do i will create an image of a particular RGB value i repeat i create an image of a particular RGB value to define the dimensions of the image i will take width and height of the image so i will just write width is equal to for example five and height is equal to four so next what do you have to do, as i said image is basically a matrix so we will take an array here so i will just write array is equal to np dot zeroes in bracket what should i write? I should write the particular dimensions i will write height comma width comma three and after that i will write one more argument here and that is dtype is equal to np dot uint eight so let me explain you what does this function do. So np dot zeros would make an array of the given size of the given dimensions so we have as the first dimension is height here and second dimension is width here and that is five and three and each pixel as you know contains three byte values for RGB so we will write three here so the first dimension is height, second dimension is width and three represent here the byte values for RGB as we know we have each by dedicated to each of the colour so we will have three byte values for RGB ok so one byte for red, one byte for green and one byte for blue. So that's why we wrote three here and then there another parameter here which is called dtype, what is dtype? Dtype basically represents the data type assigned here, the data type assigned here is uint that is unsigned int the data dtype represent the data type and what is the data type here? That is uint which is called unsigned int. So now we are done with the dimensions of the image and we have also made an array of the image so what now we have to do here is we have to make an image out of this array so i will just write a variable here for example img is equal to image image dot form array form array which should be under parameter that should be passed here would be

array. After that i should save this image, image dot save and i should give the name to the image for example will be test dot png ok so we are done with that. So now let me try to build this image and see what happens here so now as you know i will just run this file let us try to find out what kind of image has been formed here so i will just write image one dot py save it so there is some problem here let me check that. We have imported image here and capital i image is not being recognised here that is module pil dot image has no attribute form array sorry it shouldn't be form array it should be it should be from array please note the mistake here, it should be from array not form array so i will just run this again. So let me now test that image so it is test dot png as you can see there is black sort of square here so what can you infer from this image? Please note the fact that you only initialise the array with zeros, yes you only initialise the array with zeros and the colour corresponding to RGB values as zeros is black as i have already explained the RGB value of black is zero zero zero and you are only give and you are only given zero zero zero here so if i will make an image out of this array with only zeros that will only be consisting of black colour. So as you can see here according to the width and the height we have an image here and it only comprises of black colour. So as you see corresponding to give an RGB value we construct an image. Let me give you one more example of that i will take one more array for example i took array one and now i will take some other RGB values i will just write np dot zeros and i have here and i will also change and i will also change the width of this image width and height of this image i will just write hundred comma two hundred comma three and the data type would be same i will write dtype is equal to np dot uint that is unsigned int eight so that is done. So now i will assign some unique RGB values to this array so i will just write array one colon comma colon hundred i hope you are aware of this fact of list slicing in python we have already explained you in the previous videos so i will assign some unique RGB values as i said so i will assign two fifty five comma one twenty eight comma zero this is basically orange colour i will write here this is basically orange colour. And this is for the left side and for the right hand side i will write array one i will write colon comma hundred colon as we are talking about the right side so it should be hundred colon so i will write here zero zero comma two fifty five and this is basically blue colour so i will write blue colour here. And again what we will do here we will make an image out of this array so i will write img is equal to image dot from array form array from array now this time the array would be the array one and you should save this image image dot save and give another name to this image so i will just write test one dot png. So i think now our code is complete and now let us try to run this. Now let me check test one dot png so as you can see it as orange colour to the left hand side and blue colour to the right hand side so this is truly amazing we can construct images out of the RGB values so i will just repeat what we did here. First of all we need to import the numpy library as well as image library from pil package yes you have to import numpy image after doing that you need to construct an array, as i said image is basically a matrix so you need to construct a matrix, you need to construct an array here from that array you can construct an image here so i first of all i just took an array of zeros and i supplied dimensions here we supplied with an height here and three what is three denotes here? As we know each byte here would represent RGB values so there will be three bytes here so first byte will represent r second byte will g that is green and the third byte will represent the blue factor here and dtype what is dtype? Dtype is the data type which is unsigned here after that

we have constructed the array, now we need to construct an image out of this array so there is a direct function here in python and that is from array you will just write image dot from array and you need to supply the array as an parameter. So i supplied the array parameter here after that we need to save that image and as you know only zeros as RGB values corresponding on to black colour so we only had a black square here, small black square here because we gave the dimensions as a very less dimensions the width and height are very small that's why we had a very small square here small square here so after that what we did was we took another array, array one in array one we supplied some dimensions some new dimensions hundred two hundred and three which i have already explained and then we supplied the data type, data type is as usual unsigned after that what we did was after we change the values of this array for changing the values we use list slicing, in the left part of the array we had orange colour and on the right part of the array we had blue colour after that again we need to construct an image out of this array so we used the function from array so we used from array image dot from array and we supplied array one here after that we save the image and here in this particular image we had orange on the left hand side, blue at the right hand side i hope this programming screen cast is clear to you and if you have any doubts we are there to help you please post on discussion form. Thank you.