Sampling is the process of digitizing coordinates since a picture is continuous not only in its co-ordinates (x axis), but also in its amplitude (y axis). Quantization refers to the process of digitizing the amplitude.

Sampling.

Sampling has already been introduced in our tutorial of introduction to signals and system. But we are going to discuss here more.

Here what we have discussed of the sampling.

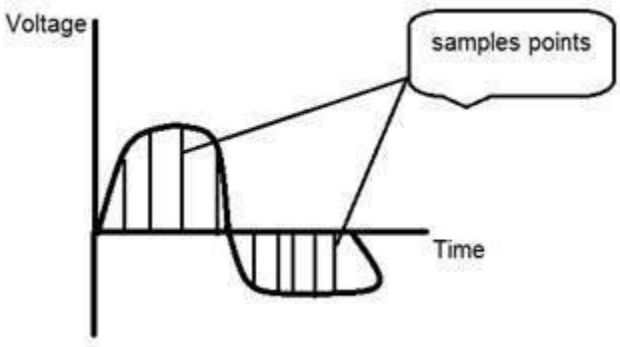
The term sampling refers to take samples

We digitize x axis in sampling

It is done on independent variable

In case of equation y = sin(x), it is done on x variable

It is further divided into two parts , up sampling and down sampling



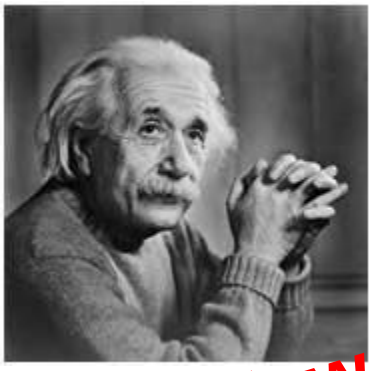
You can observe that the signal has some arbitrary changes if you look at the above figure. Noise is to blame for these differences. By obtaining samples during sampling, we can lower this noise. It seems to reason that as we take more samples, the image

In this tutorial we are going to introduce the concept of zooming, and the common techniques that are used to zoom an image.

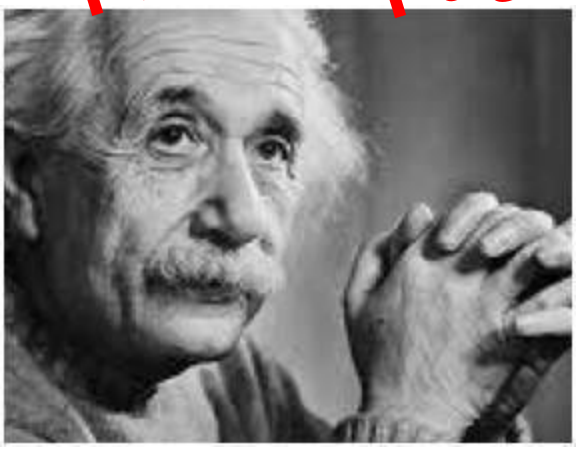
Zooming

Zooming simply means enlarging a picture in a sense that the details in the image became more visible and clear. Zooming an image has many wide applications ranging from zooming through a camera lens, to zoom an image on internet e.t.c.

For example



is zoomed into



You can zoom something at two different steps.

The first step includes zooming before taking an particular image. This is known as pre processing zoom. This zoom involves hardware and mechanical movement.

2	2	3
3	3	4

We take two adjacent column pixel values which are 1 and 3. We add them and got 4. 4 is then divided by 2 and we get 2 which is placed in between them. The same method is applied in all the columns.

New image size

As you can see that the dimensions of the new image are 3 x 3 where the original image dimensions are 2 x 2. So it means that the dimensions of the new image are based on the following formula

(2(number of rows) minus 1) X (2(number of columns) minus 1)

Advantages and disadvantage.

One of the advantage of this zooming technique , that it does not create as blurry picture as compare to the nearest neighbor interpolation method. But it also has a disadvantage that it can only run on the power of 2. It can be demonstrated here.

Reason behind twice zooming:

Consider the above image of 2 rows and 2 columns. If we have to zoom it 6 times, using zero order hold method , we can not do it. As the formula shows us this.

It could only zoom in the power of 2 2,4,8,16,32 and so on.

Even if you try to zoom it, you can not. Because at first when you will zoom it two times, and the result would be same as shown