1.a Pixel size of 1^{st} Image - 0.5 x 0.5

Pixel size of 2^{nd} image - 0.25 x 0.25

we see that the pixels in the second image are proportionally smaller in both the dimensions by the same amount and thus we must try to scale the image I_1 about the origin by a factor of two to allow it to align with the ~~second~~ image resolution

so if we have the image I_1 as $I_1(v)$ we must multiply each pixel by the scaling matrix T given by

$$\begin{bmatrix} 2 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 0 \end{bmatrix}$$

- This is to just match the number of pixels in I_2 with that of I_1.

- Then we identify the control points in lower resolution image which is 0.5x0.5 and then compare it to the corresponding pixels in the ~~bigger~~ resolution image viz 0.25x0.25 and use affine transformation

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b. Pixel image of 2nd image - 0.25×0.5
Here we must see that pixels in the 1st dimension of 2nd image is smaller by a factor of 2. Thus we must scale ~~do~~ on the first image having 0.5×0.5 pixel size to match the no. of pixels in 0.25×0.5 pixel image size

we multiply in by matrix

$$T = \begin{bmatrix} 2 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 0 \end{bmatrix}$$

→ Then as we did in 1st part, we identify control points in both the images and use affine transformation