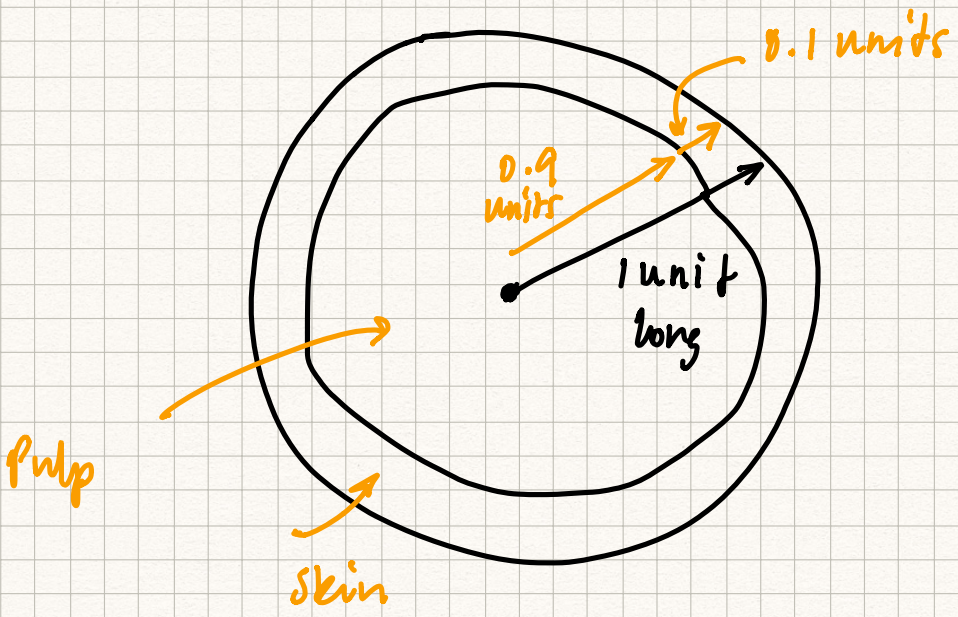
THE CURSE OF DIMENSIONALITY

An Orange



In 3 dimensions, the volume of pulp to the total volume of the orange is

$$\frac{\pi \times (0.9)^3}{\pi \times (1)^3} = 0.729 \cong 73\%$$

In 4 dimensions, the volume of pulp in the 4 dimensional hypersphere is

$$\frac{\pi(0.9)^4}{\pi(1)^4} = 0.656 \cong 66\%$$

$$\vdots$$

In 40 dimensions, the volume becomes

$$\frac{\pi(0.9)^{40}}{\pi(1)^{40}} = 0.01478 \simeq 1.5\%$$