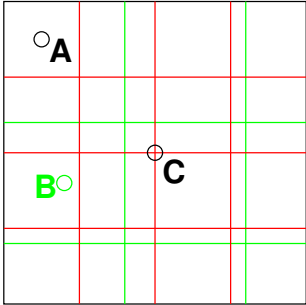


# Rescaling of images and coordinates with pixel centric coordinate system

## Model A: Invariant image boundaries



**Original Image: Size 4 by 4**

Resizing with factor: 1.6

**New Image: Size 2.5 by 2.5**

Image boundaries are invariant!!!

Coordinate transfer:  $\text{old} = (\text{new} + 0.5) * \text{factor} - 0.5$

$\text{new} = (\text{old} + 0.5) / \text{factor} - 0.5$

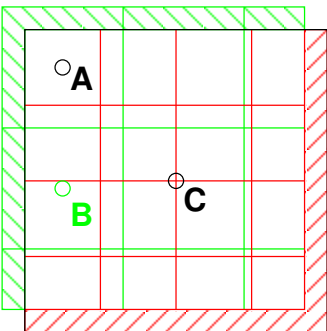
Examples:

A:  $\text{old} = (0, 0)$        $\text{new} = (-0.1875, -0.1875)$

C:  $\text{old} = (1.5, 1.5)$     $\text{new} = (0.75, 0.75)$

B:  $\text{old} = (0.3, 1.9)$     $\text{new} = (0, 1)$

## Model B: Simple coordinate transfer



**Original Image: Size 4 by 4**

Resizing with factor: 1.6

**New Image: Size 2.5 by 2.5**

Origin is invariant!

Coordinate transfer:  $\text{old} = \text{new} * \text{factor}$

$\text{new} = \text{old} / \text{factor}$

Examples:

A:  $\text{old} = (0, 0)$        $\text{new} = (0, 0)$

C:  $\text{old} = (1.5, 1.5)$     $\text{new} = (0.9375, 0.9375)$

B:  $\text{old} = (0, 1.6)$        $\text{new} = (0, 1)$

**Problem: Physical images do not overlap!!**