

Homework-3 Solutions

Question 1

	$x = 0$	$x = 1$	$x = 2$	$x = 3$	$x = 4$	$x = 5$	$x = 6$	$x = 7$
$y = 0$	10	20	30	40	50	0	70	80
$y = 1$	40	50	60	30	50	0	60	70
$y = 2$	70	80	90	20	50	0	50	60
$y = 3$	100	110	120	10	50	0	40	50
$y = 4$	130	140	150	0	50	0	30	40
$y = 5$	160	170	180	0	50	0	20	30
$y = 6$	190	200	210	0	50	0	10	20

The above picture is transformed by a geometric transformation. The (forward) description of this transformation is:

The pixel at coordinate (x, y) in the original picture moves to the location $(6 - 3y, 6 - 2x)$ in the new picture.

A.

Compute the transformed image using Nearest-Neighbor interpolation over the 2×2 window specified below:

	$x = 0$	$x = 1$
$y = 0$	20	20
$y = 1$	20	20

This result is obtained with $\text{round}(2.5) = 3$.

B.

Compute the transformed image using Bilinear interpolation over the 2×2 window specified below:

Answer:

	$x = 0$	$x = 1$
$y = 0$	20	23
$y = 1$	55	52