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CS 478
sec 1

k-Nearest Hw

New point (0.5, 0.2)

	X	Y	Target		
1	0.3	0.8	A	$\lvert(0.5-0.3)\rvert + \lvert(0.2-0.8)\rvert = 0.8$ ✓	A
2	-0.3	1.6	B	$\lvert(0.5+0.3)\rvert + \lvert(0.2-1.6)\rvert = 2.2$	B
3	0.9	0	B	$\lvert(0.5-0.9)\rvert + \lvert(0.2-0)\rvert = 0.6$ ✓	B
4	1	1	A	$\lvert(0.5-1)\rvert + \lvert(0.2-1)\rvert = 1.3$ ✓	A

vote

No Distance Weighting A: 1, 4 B: 3 → Output: A

Squared Inverse Distance weighting

$1/0.8^2 = 1.5625$ ✓ A

$1/2.2^2 = 0.2066$

$1/0.6^2 = 2.7778$ ✓ B

$1/1.3^2 = 0.5917$ ✓ A

$1.5625 + 0.5917 = 2.1542$

vote

A = 2.1542

B = 2.7778

Output: B

Regression, squared inverse distance weighting

	X	Y	Regression	Distance
1	0.3	0.8	0.6	0.8
2	-0.3	1.6	-0.3	2.2
3	0.9	0	0.8	0.6
4	1	1	1.2	1

$(0.8/0.6^2 + 0.6/0.8^2 + 1.2/1.3^2) / (1/0.6^2 + 1/0.8^2 + 1/1.3^2)$

$3.8698 / 4.932$

Regression value = 0.7846