HW3

@ 111

Problem 1) $n=5$

$x_{Present} = [-71, -135, -96, -239]$

$y_{Present} = [124, -16, -214, 169]$

$x_{Missing} = 1$ $\quad y_{Missing} = 0$

$K = 114$

solution

$x_{Ord} = [-239, -135, -96, -71]$

$y_{Ord} = [-214, -16, 124, 169]$

for x 3 choices:

$x \leq -135 \rightarrow x_{Med} = -135$

$-135 < x < -96 \rightarrow x_{Med} = x$

$x \geq -96 \rightarrow x_{Med} = -96$

for y

$y \leq -16 \quad y_{Med} = -16$

$-16 < y < 124 \quad y_{Med} = y$

$y \geq 124 \quad y_{Med} = 124$

x 1) $x \leq -135 \quad x_M = -135 \quad |-135+16| \neq 114$

$y \leq -16 \quad y_M = -16$

x 2) $x \leq -135 \quad x_M = -135 \quad |-135-y| = 114$

$-135 - y = 114$

$y = -249$ x

$-16 < y < 124 \quad x_M = y \quad -135 - y = -114 \rightarrow y = -21$ x

x 3) $x \leq -135 \quad x_{Med} = -135 \quad |-135-124| \neq 114$

$y \geq 124 \quad y_M = 124$

$x = -130$ 4) $-135 < x < -96 \quad x_M = x \quad |x+16| = 114$

$x + 16 = 114$

$x = 98$ x

$y \leq -16 \quad y_M = -16 \quad x + 16 = -114 \rightarrow x = -130$

skip 5) $-135 < x < -96 \quad x_M = x \quad |x-y| = 114$

$-16 < y < 124 \quad y_M = y$

124
-114

$x - 124 = 114$
$x = 238$ ×

6) $-135 < x < -96$ $x_M = x$ $|x - 124| = 114$ ✓
$y \geq 124$ $y_M = 124$ $x - 124 = -114$ $x = 10$ ×

7) $x \geq -96$ $x_M = -96$ $|-96 + 16| \neq 114$
$y \leq -16$ $y_M = -16$

$-96 - y = 114$
$y = -210$ ×

114
-96
18

8) $x \geq -96$ $x_M = -96$ $|-96 - y| = 114$ ✓
$-16 < y < 124$ $y_M = y$ $-96 - y = -114 \rightarrow y = 18$
$y = 18$

9) $x \geq -96$ -96 $|-96 - 124| \neq 114$
$y \geq 124$ 124

L_∞ $[-71, \quad, -135, -96, -239]$
$-[\quad, 124, -16, -214, 169]$
$-71 - y, x - 124, -119, 118, -408$

$L_\infty = 408$

408
71
337

$x = -130$
$y = -479$

$x = -130 \rightarrow |-71 - y| = 408$ ✓
$y \leq -16$

$-71 - y = 408 \rightarrow y = -479$
$-71 - y = -408 \rightarrow y = 337$

$y = 18$
$x \geq -96$

$|x - 124| = 408$ ✓
$x - 124 = 408 \rightarrow x = 532$
$x - 124 = -408 \rightarrow x =$

$x = 532$
$y = 18$

$x = 532 \quad y = 18$ $L_\infty = 408$

Check

$x_{Median} = -96$ $|-96 - 18| = 114$ ✓
$y_{Median} = 18$