CS325

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PROMGRAMMING ASSIGNMENT 3

LEAST SQUARES ISN'T GOOD ENOUGH FOR ME

LINEAR PROGRAM

Objective: Minimize…

$$\max_{1 \le i \le n} |ax_i + b - y_i|$$

Set of Constraints:

a = $\mathbb{R}$, b = $\mathbb{R}$, x = $\mathbb{R}$, y = $\mathbb{R}$ (all of variables are real numbers)

OPTIMAL/BEST SOLUTION

Problem: [Set of Points]

(1, 3), (2, 5), (3, 7), (5, 11), (7, 14), (8, 15), (10, 19)

Optimal/Best Solution:

y = 1.741x + 1.615

LINEAR PROGRAM SOLVER OUTPUT

// Result from program

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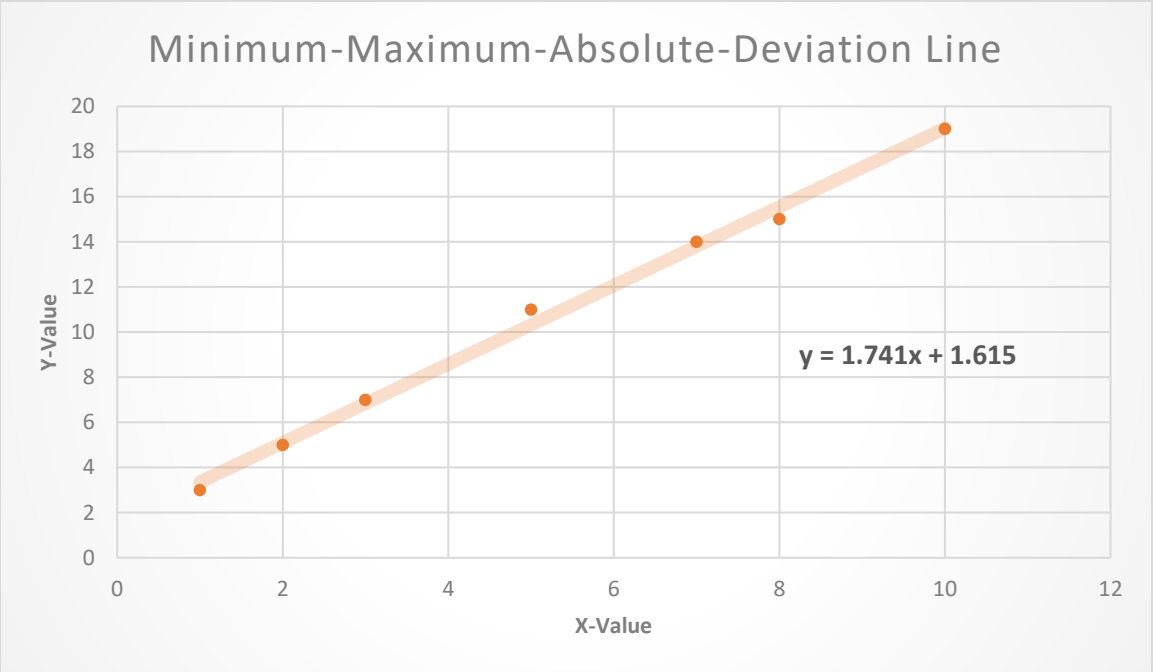
SOLUTION PLOT



LOCAL TEMPERATURE CHANGE

LINEAR PROGRAM

Objective: Minimize…

$$T(d) = \underbrace{x_0 + x_1 \cdot d}_{\text{linear trend}} + \underbrace{x_2 \cdot \cos\left(\frac{2\pi d}{365.25}\right) + x_3 \cdot \sin\left(\frac{2\pi d}{365.25}\right)}_{\text{seasonal pattern}} + \underbrace{x_4 \cdot \cos\left(\frac{2\pi d}{365.25 \times 10.7}\right) + x_5 \cdot \sin\left(\frac{2\pi d}{365.25 \times 10.7}\right)}_{\text{solar cycle}}$$

Set of Constraints:

x = $\mathbb{R}$ (real numbers)

d = W (whole numbers)

OPTIMAL SOLUTION

Values of Variables:

// From the program

Linear Program Solver Output:

// Result from program

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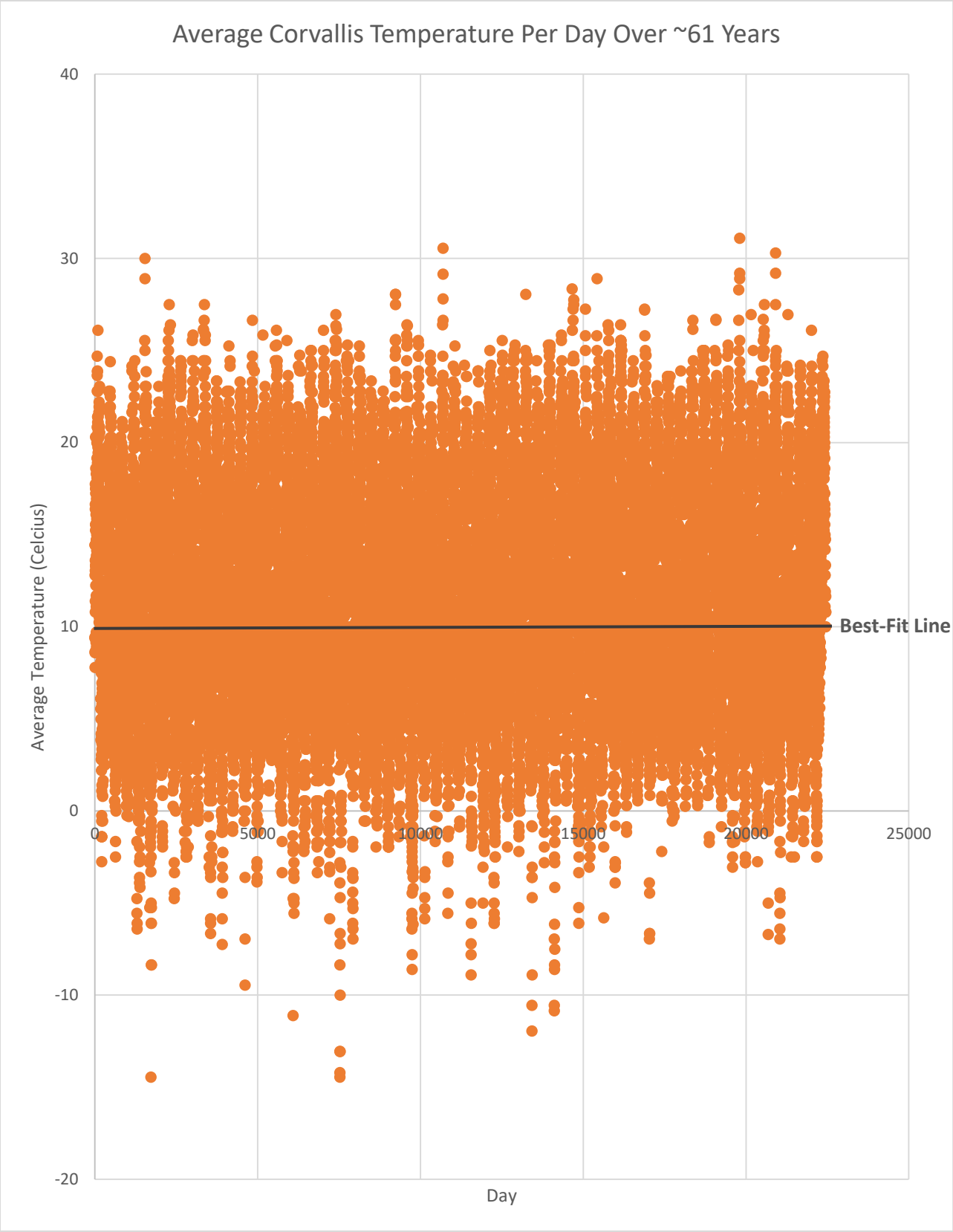
SOLUTION PLOT // Needs linear line calculated by program



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ANSWERS TO YOUR QUESTIONS

1) Based on the value x_1, how many degrees Celsius per century is Corvallis changing?

   Corvallis is changing at # degrees Celsius per century.

2) Is it a warming or cooling trend?

   The average temperature change of Corvallis is a warming/cooling trend.