Weight = 2, 4, 5, 3, 6, 5, 7

Price = 35, 60, 20, 50, 50, 55, 60

Task 1

Compute slope (M)

$$M = \frac{\bar{x}\bar{Y} - \overline{xY}}{(\bar{x})^2 - \bar{x^2}}$$

$\bar{x} = (2+4+5+3+6+5+7)/7 = 4.57$

$\bar{Y} = (35+60+20+50+50+55+60)/7 = 47.14$

$\bar{xy} = (70+240+100+150+300+275+420)/7 = 222.14$

$(\bar{x})^2 = (4.57)^2 = 20.88$

$\bar{x^2} = (4+16+25+9+36+25+49)/7 = 23.43$

$\bar{x}\bar{y} = 4.57 \times 47.14 = 215.43$

$$M = \frac{215.43 - 222.14}{20.88 - 23.43} = \frac{-6.71}{-2.55} = 2.63$$

Compute intercept (C)

$$C = \bar{y} - (M \times \bar{x})$$

$$= 47.14 - (2.63 \times 4.57)$$

$$= 35.12$$

When vegetable weight is 6,

$$\text{pred\_w6} = M \times 6 + C = 2.63 \times 6 + 35.12$$

$$= 50.9$$

Task 2 Residuals

x	y	$\hat{y}$	$\lvert y-\hat{y}\rvert$
2	35	40.4	5.4
4	60	45.66	14.34
5	20	48.29	28.29
3	50	43.03	6.97
6	50	50.9	0.9
5	55	48.29	6.71
7	60	53.55	6.45

Residuals $= |y-\hat{y}|$

Task 3

$$MSE = \frac{1}{n}\sum_{i=1}^{n}(y_i-\hat{y}_i)^2$$

$$= (29.16+205.64+800+32+48.58+0.81+45.02+41.60)/7$$

$$= 1171.13/7 \approx 167.30$$

$$MAE = \frac{1}{n}\sum_{i=1}^{n}|y_i-\hat{y}_i|$$

$$= (5.4+14.34+28.29+6.97+0.9+6.71+6.45)/7$$

$$= 69.06/7 = 9.86$$