HW4

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Problem 1

(a)

Hypothesis testing is valuable here because while the summary shows us that the estimate is non-zero, it doesn't mean that the predictor X_3 actually influences Y. It would be rare to see an estimate that is truly zero due to noise.

We can use hypothesis testing to determine if the estimate is a real signal or just random luck.

In the case of X_3, the estimate is non-zero, but the P-value is 0.334 which is much higher than the $\alpha = 0.05$ threshold, therefore, X_3 is not a good predictor of Y

(b)

I disagree with this claim. Even if we knew the true $f(X)$, there is still error (ϵ) that we cannot predict.

$Y = f(X) + \epsilon$

(c)

(d)

(e)

(f)

Problem 2

(a)

(b)

(c)

(d)

(e)

Problem 3

Problem 4

(a)

(b)

(c)

(d)

(e)

(f)

(g)

(h)

(i)