

(2)

The final result of KNN classifier is the classification output for Y (qualitative), where as the output for a KNN regression predicts the quantitative value for $f(X)$.

(4)

(a) I would expect the polynomial regression to have a lower training RSS than the linear regression because it could make a tighter fit against data that matched with a wider irreducible error ($\text{Var}(\epsilon)$).

(b) I would expect the polynomial regression to have a higher test RSS as the overfit from training would have more error than the linear regression.

(c) Polynomial regression has lower train RSS than the linear fit because of higher flexibility: no matter what the underlying true relationship is the more flexible model will closer follow points and reduce train RSS.

(d) It depends on the relationship between X and Y . If it is closer to linear than cubic, the linear regression test RSS could be lower than the cubic regression test RSS. Or, if it is closer to cubic than linear, the cubic regression test RSS could be lower than the linear regression test RSS.

(5)

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