



# Implementing ridge regression via gradient descent

8 questions

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1.

We run ridge regression to learn the weights of a simple model that has a single feature (`sqft_living`), once with `l2_penalty=0.0` and once with `l2_penalty=1e11`.

***What is the value of the coefficient for `sqft_living` that you learned with no regularization, rounded to 1 decimal place? Use American-style decimals (e.g. 30.5)***

263.0

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2.

This question refers to the same model as the previous question.

***What is the value of the coefficient for `sqft_living` that you learned with high regularization (`l2_penalty=1e11`)? Use American-style decimals (e.g. 30.5) and round your answer to 1 decimal place.***

124.6

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3.

This question refers to the same model as the previous question.

***Comparing the lines you fit with the with no regularization versus high regularization ( $l2\_penalty=1e11$ ), which one is steeper?***

- ☐ Line fit with no regularization ( $l2\_penalty=0$ )
- ☐ Line fit with high regularization ( $l2\_penalty=1e11$ )
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4.

This question refers to the same model as the previous question.

***Using the weights learned with high regularization ( $l2\_penalty=1e11$ ), make predictions for the TEST data. In which of the following ranges does the TEST error (RSS) fall?***

- ☐ Between  $8e13$  and  $2e14$
- ☐ Between  $2e14$  and  $5e14$
- ☐ Between  $5e14$  and  $8e14$
- ☐ Between  $8e14$  and  $1e15$
- ☐ Between  $1e15$  and  $3e15$
- 

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5.

We run ridge regression to learn the weights of a model that has two features (sqft\_living, sqft\_living15), once with  $l2\_penalty=0.0$  and once with  $l2\_penalty=1e11$ .

***What is the value of the coefficient for sqft\_living that you learned with no regularization, rounded to 1 decimal place? Use American-style decimals (e.g. 30.5).***

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6.

This question refers to the same model as the previous question.

***What is the value of the coefficient for sqft\_living that you learned with high regularization ( $l2\_penalty=1e11$ )? Use American-style decimals (e.g. 30.5) and round your answer to 1 decimal place.***

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7.

This question refers to the same model as the previous question.

***Using the weights learned with high regularization ( $l2\_penalty=1e11$ ), make predictions for the TEST data. In which of the following ranges does the TEST error (RSS) fall?***

- ☒ Between  $8e13$  and  $2e14$
- ☐ Between  $2e14$  and  $4e14$
- ☐ Between  $4e14$  and  $8e14$
- ☐ Between  $8e14$  and  $1e15$

☐ Between  $1e15$  and  $3e15$

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8.

This question refers to the same model as the previous question.

***Predict the price of the first house in the test set using the weights learned with no regularization. Do the same using the weights learned with high regularization. Which weights make better prediction for the first house in the test set?***

- ☐ The weights learned with no regularization ( $l2\_penalty=0$ )
- ☐ The weights learned with high regularization ( $l2\_penalty=1e11$ )
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