Regularization

Quiz, 5 questions

1 point

1.

You are training a classification model with logistic

regression. Which of the following statements are true? Check

all that apply.

- [ ] Adding a new feature to the model always results in equal or better performance on the training set.
- [ ] Introducing regularization to the model always results in equal or better performance on examples not in the training set.
- [ ] Adding many new features to the model helps prevent overfitting on the training set.
- [ ] Introducing regularization to the model always results in equal or better performance on the training set.

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1 point

2.

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Suppose you ran logistic regression twice, once with $\lambda = 0$, and once with $\lambda = 1$. One of the times, you got

parameters $\theta = \begin{bmatrix} 81.47 \\ 12.69 \end{bmatrix}$, and the other time you got

$\theta = \begin{bmatrix} 13.01 \\ 0.91 \end{bmatrix}$. However, you forgot which value of

λ corresponds to which value of θ. Which one do you

think corresponds to $\lambda = 1$?

- $\theta = \begin{bmatrix} 81.47 \\ 12.69 \end{bmatrix}$
- $\theta = \begin{bmatrix} 13.01 \\ 0.91 \end{bmatrix}$

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1 point

3.
Which of the following statements about regularization are

true? Check all that apply.

- Using a very large value of λ cannot hurt the performance of your hypothesis; the only reason we do not set λ to be too large is to avoid numerical problems.
- Because logistic regression outputs values $0 \leq h_\theta(x) \leq 1$, its range of output values can only be "shrunk" slightly by regularization anyway, so regularization is generally not helpful for it.
- Consider a classification problem. Adding regularization may cause your classifier to incorrectly classify some training examples (which it had correctly classified when not using regularization, i.e. when $\lambda = 0$).
- Using too large a value of λ can cause your hypothesis to overfit the data; this can be avoided by reducing λ.

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4.

In which one of the following figures do you think the hypothesis has overfit the training set?

Figure:

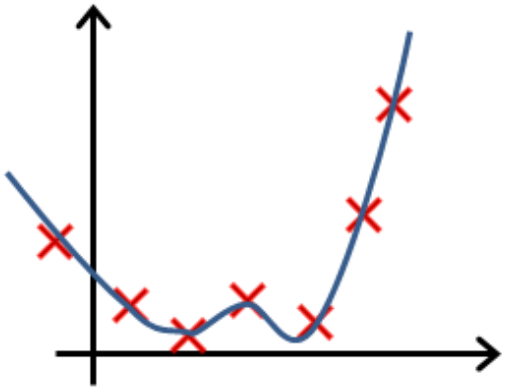

Figure:

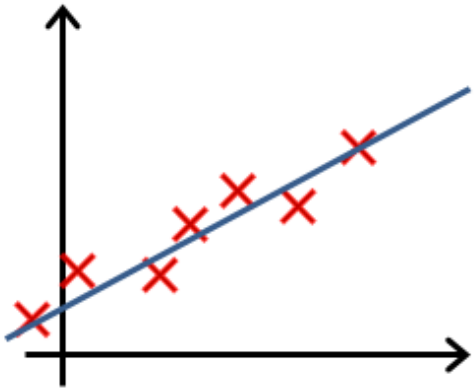

Figure:

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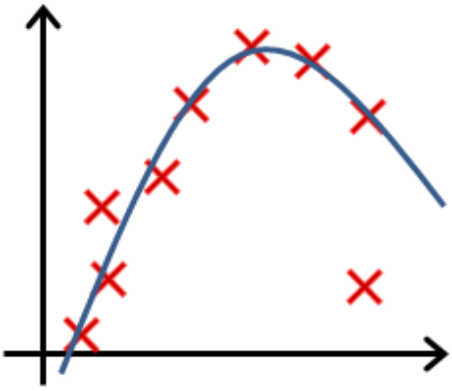
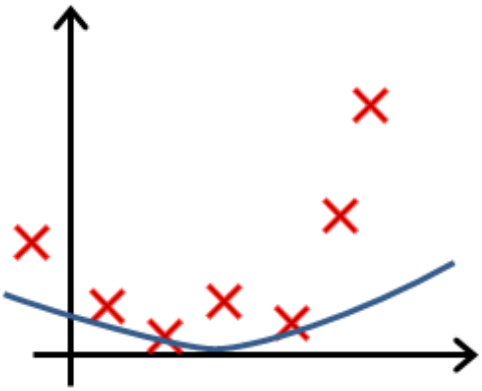


Figure:



1 point

5.

In which one of the following figures do you think the hypothesis has underfit the training set?

Figure:

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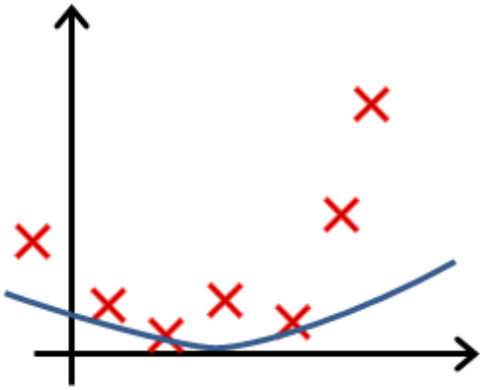

Figure:

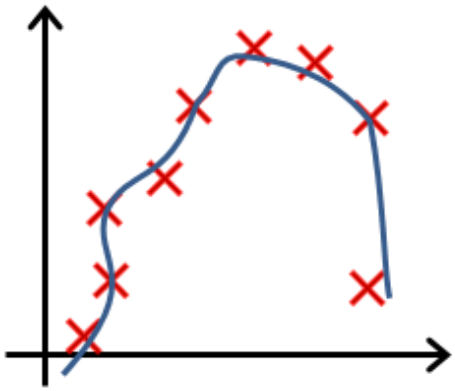

Figure:

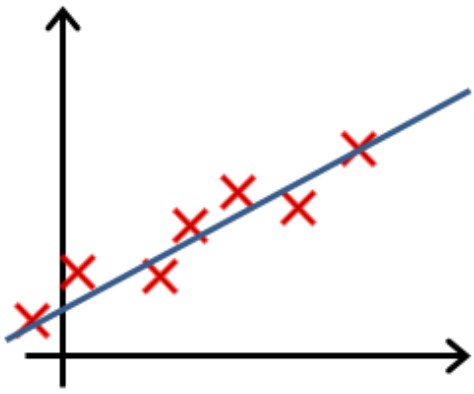

Figure: