1. You are training a classification model with logistic regression. Which of the following statements are true? Check all that apply.

1 point

- [ ] Introducing regularization 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.
- [x] Adding many new features to the model helps prevent overfitting on the training set.
- [ ] Adding a new feature to the model always results in equal or better performance on the training set.

2. Suppose you ran logistic regression twice, once with $\lambda = 0$, and once with $\lambda = 1$. One of the times, you got parameters $\theta = \begin{bmatrix} 23.4 \\ 37.9 \end{bmatrix}$, and the other time you got $\theta = \begin{bmatrix} 1.03 \\ 0.28 \end{bmatrix}$. However, you forgot which value of λ corresponds to which value of θ. Which one do you think corresponds to $\lambda = 1$?

1 point

- ( ) $\theta = \begin{bmatrix} 23.4 \\ 37.9 \end{bmatrix}$
- (•) $\theta = \begin{bmatrix} 1.03 \\ 0.28 \end{bmatrix}$

3. Which of the following statements about regularization are true? Check all that apply.

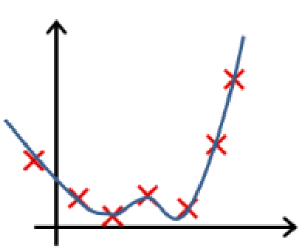
1 point

- [x] Using too large a value of λ can cause your hypothesis to underfit the data.
- [ ] 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.
- [ ] Because regularization causes $J(\theta)$ to no longer be convex, gradient descent may not always converge to the global minimum (when $\lambda > 0$, and when using an appropriate learning rate α).
- [ ] 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.

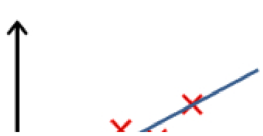
4. In which one of the following figures do you think the hypothesis has overfit the training set?

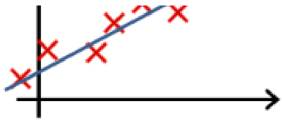
1 point

(•) Figure:

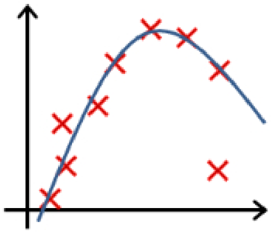


( ) Figure:

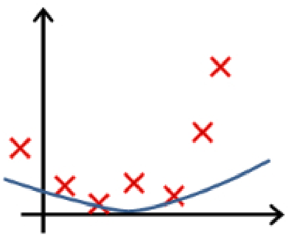




○ Figure:



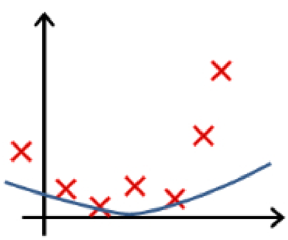
○ Figure:



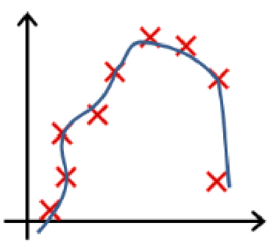
5. In which one of the following figures do you think the hypothesis has underfit the training set?

1 point

◉ Figure:



○ Figure:



○ Figure:

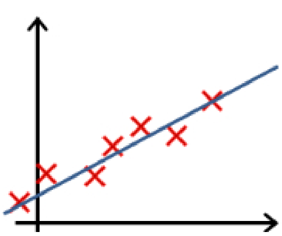
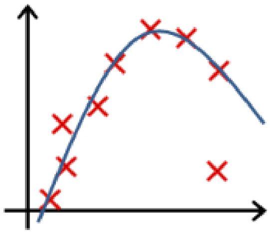


Figure:



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