

# Anomaly Detection

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1.

For which of the following problems would anomaly detection be a suitable algorithm?



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2.

Suppose you have trained an anomaly detection system that flags anomalies when  $p(x)$  is less than  $\epsilon$ , and you find on the cross-validation set that it has too many false positives (flagging too many things as anomalies). What should you do?



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3.

Suppose you are developing an anomaly detection system to catch manufacturing defects in airplane engines. Your model uses

$$p(x) = \prod_{j=1}^n p(x_j; \mu_j, \sigma_j^2).$$

You have two features  $x_1$  = vibration intensity, and  $x_2$  = heat generated. Both  $x_1$  and  $x_2$  take on values between 0 and 1 (and are strictly greater than 0), and for most "normal" engines you expect that  $x_1 \approx x_2$ . One of the suspected anomalies is that a flawed engine may vibrate very intensely even without generating much heat (large  $x_1$ , small  $x_2$ ), even though the particular values of  $x_1$  and  $x_2$  may not fall outside their typical ranges of values. What additional feature  $x_3$  should you create to capture these types of anomalies:

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4.

Which of the following are true? Check all that apply.

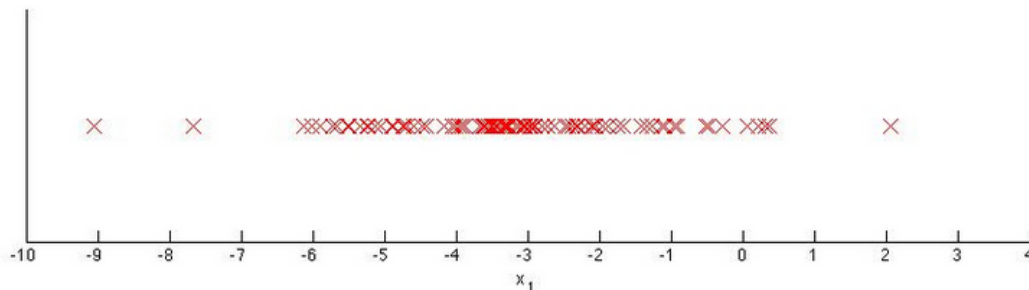
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5.

You have a 1-D dataset  $\{x^{(1)}, \dots, x^{(m)}\}$  and you want to detect outliers in the dataset. You first plot the dataset and it looks like this:



Suppose you fit the gaussian distribution parameters  $\mu_1$  and  $\sigma_1^2$  to this dataset. Which of the following values for  $\mu_1$  and  $\sigma_1^2$  might you get?

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