# Congratulations! You passed!

**Grade received** 100%
**Latest Submission Grade** 100%
**To pass** 80% or higher

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**1.** A car repair shop receives a car with reports of strange noises coming from the engine. The shop knows 90% of the cars that come in for "noises" have a loose fan belt while the other 10% have a loose muffler. A common description, 95%, of cars having loose mufflers are reported as a rattle. Less commonly, 8%, fan belt issues can also sound like a rattle. The car owner is describing the strange noise as a rattle. What is the probability the car has a loose muffler? **1 / 1 point**

- 0.95
- 0.78
- 0.57 (selected)

**Correct**
Yes! Bayes gives us a way to update our prior probabilities given new data.

**2.** It is estimated that 80% of emails are spam. You have developed a new algorithm to detect spam. Your spam software can detect 99% of spam emails but has a false positive rate of 5%. Your company receives 1000 emails in a day, how many emails will be incorrectly marked as spam? **1 / 1 point**

- 50
- 5
- 20

- (●) 10
- ( ) 200

✓ **Correct**
Yes! Bayes tells us how to update probabilities.

**3.** You have developed a new algorithm for detecting fraud. It has a sensitivity of 90% with a specificity of 95%. Choose the correct statement: **1 / 1 point**

- ( ) true positive rate = 90%, true negative rate = 5%
- (●) true positive rate = 90%, true negative rate = 95%

✓ **Correct**
Correct!

**4.** Cost functions are measures of fit. **1 / 1 point**

- ( ) false
- (●) true

✓ **Correct**
Correct! The score is an indication of how well the model fits the data.

**5.** Cost functions are only useful in categorical decision settings. **1 / 1 point**

- (●) false
- ( ) true

✓ **Correct**
Correct. Cost functions are definable for both discrete and continuous problems.

**6.** The following is a valid example of a cost function: **1 / 1 point**

(A)

$$L(\theta, a) = \begin{cases} 0, \text{for (predict disease, actual disease),(predict no disease, actual no disease)} \\ 1, \text{for predict no disease, actual no disease} \\ 100, \text{for predict disease, actual no disease} \end{cases}$$

(B)

$$L(\theta, a) = \begin{cases} 0, \text{for (predict disease, actual disease),(predict no disease, actual no disease)} \\ 1, \text{for predict no disease, actual disease} \\ 100, \text{for predict disease, actual no disease} \end{cases}$$

- ○ A
- ◉ B

✓ **Correct**
Correct! Each possible outcome is assigned a cost in the loss function.

**7.** In a recent study, you created a cost function for classification of 4 classes. Following training, you obtained the following resuls. What are the predictions for the samples in terms of thier class? **1 / 1 point**

```
predictions = np.array([[0.25,0.25,0.20,0.30],
                        [0.25,0.30,0.20,0.25],
                        [0.10,0.25,0.25,0.40],
                        [0.45,0.10,0.20,0.25],
                        [0.01,0.01,0.01,0.96]])
```

- ○ A,B,C,B
- ◉ D,B,D,A,D
- ○ D,B,C,E

**Correct**