

# Do You See What I See? Post-Quiz **Answer Key**

Complete the following essay questions:

1. Describe the software design process and how you used it in this lesson.

*Example answer:* The software design process is a cyclical process that organizes your work and enables viable solutions to be created. In this lesson, we applied the first two steps of the design process. First, when our team did research and learned about OCR, we were identifying the problem and the constraints that shape it. Next, we applied the second part of the design process when we created an algorithm as our solution to the challenge. Creating this algorithm was the design phase of the process.

2. What is OCR and explain the technique(s) that your algorithm utilized.

*Example answer:* OCR is the act of turning an image of text (or in our case, a number) into text that a computer can understand. As an image, text is only pixels of color, and the goal of OCR is to turn that unreadable data into text and numbers.

*Image pre-processing:* We modify the images from full-color versions into black and white images in order to more starkly contrast the “data” that we care about from the background portions of the image.

*Image de-skewing:* Often, images are captured from an angle, not straight-on, making it more difficult to identify them. We use techniques to adjust the pixels to make the images appear as though they were taken from more direct angles.

*Focusing of the window on the relevant data:* In an initialization phase, we will have users define a specific window that will always contain the important information.

*Seven-segment specific testing:* By only looking for seven-segment digits, it simplifies our algorithm because we do not need to identify every conceivable letter.

3. Why is a design process important to developing good solutions to problems?

*Example answer:* A design process gives structure to solving problems. That structure—consisting of requirement analysis, design, implementation, testing and evolution—provides building blocks that engineers use to create or improve design solutions. Since the process is cyclical, it is ongoing. As you “finish” one cycle, you begin another that forces you to continue to think and improve. Or, as you run into problems, you go back in the cycle and begin again with an altered approach.