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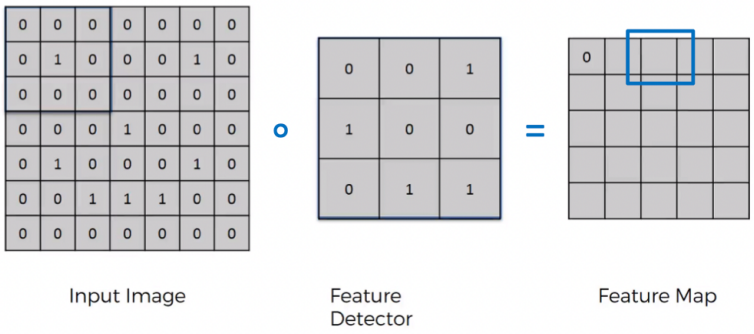
# In-Class Problem

1. What is the input (x) to the discriminator function D(x)?
2. What is the output of D(x)?
3. What is the input (z) to the generator function G(z)?
4. What is the output of G(z)?
5. What is the output of D(G(z))?
6. Calculate the value for the convolution cell outlined in blue below.
7. If [[5,6],[8,9]] represents a 2 X 2 segment of a CNN feature map.
   a) What is the max pooling value of segment?
   b) What is the average pooling value of the segment?
8. What is the ReLU function of each of the values -1.1, 0, and 6.4?




Generative Adversarial Network (GAN) David O. Johnson EECS 690 (Spring 2021) 47

1. What is the input (x) to the discriminator function D(x)?

   **X is either true or generated.**

2. What is the output of D(x)?

   **Output a scalar value between 0 and 1.**

3. What is the input (z) to the generator function G(z)?

**Z is the noise fed into the function**

4. What is the output of G(z)?

   **Output a matrix with dimensions similar to the dimensions of x, and by doing so generate an image x capable of fooling D.**

5. What is the output of D(G(z))?

   **Output a value between 0 and 1, where an output close to 1 would mean that D is fooled and an output close to 0 would mean that D realized the image to be fake.**

6. Calculate the value for the convolution cell outlined in blue below.

   **0*0 + 0*0 + 0*1 + 1*0 + 0*0 + 0*0 + 0*0 + 0*1 + 0*1 = 0**

7. If [[5,6], [8,9]] represents a 2 X 2 segment of a CNN feature map.
   1. What is the max pooling value of segment?

      **9**

   2. What is the average pooling value of the segment?

      **(5 + 6 + 8 + 9) / 4 = 7**

8. What is the ReLU function of each of the values -1.1, 0, and 6.4?

   max(-1.1, 0) = 0

   max(0, 0) = 0

   max(6.4, 0) = 6.4