1. Figure Q1 depicts a block that consists of three convolutional layers. The input volume has a size of $256 \times 32 \times 32$ and the second layer has 32 convolution filters each with a size of $64 \times 3 \times 3$, stride = 1 and padding = 1.

   Provide the values of n_1, d_1, F_1, n_2, d_2, and F_2 to form a valid block. Explain your design.

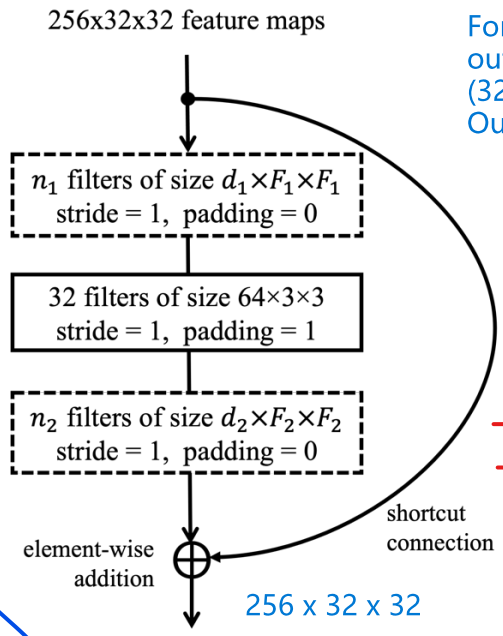

Figure Q1

Output size = (W - F1 + 1)
since stride=1 and padding=0

to match the output of the third layer, n2 = 256

to find F2, (32 - F2)/1 + 1 = 32
Thus, F2 is 1

Setting F1 = 1 is common i ResNet design

For W=32, set F1 to 1 so that the output size is still 32x32.
(32 - 1)/1 + 1
Output = (n1,32,32)

After second layer,
Output size = (32,32) due to padding, stride and input size
(32-3 +2(1))/1 +1

n1 = 64 to match second layer input depth =64

32 filters for second layer means input depth =32 for third layer

Output = (32,32,32)

2. Study and try the tutorial t7q2.ipynb on transfer learning. In particular,
   a. Understand how to data augmentation is performed
   b. Review the transfer learning steps
   c. Try the code to perform transfer learning on the classification of bees vs. ants

d1 = 256
d2 = 32

d1 and d2 are chosen to match the depth of their corresponding input.