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COSE474 01
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Project #2: CNN Architecture Implementation

The discussion of the code:

Question 1: Implementation of the “bottleneck building block”:

- Downsample is set to False. The 1st block after the “if statement” is only executed if downsample is true, therefore the convolution layers would have stride = 2.
- For the “else” block, the convolution layers would have stride = 1.
- After the layers are applied, the size of the images needs to equal the size of the output image (8*8 for the first case), so the padding for the conv3x3 is 1 and for the other layers, it is 0.

Question 2 : Implementation of the "class, ResNet50_layer4" part

- Cifar-10 dataset has 10 classes.
- For the nn.Sequential layers, I filled them up based on the table in the project description page 14.
- For the paddings, we solve the equation:

output = (input - kernel_size + 2 Paddings) / Stride +1

- The in_features of the fc layer is the output from the final convolutional layer, which is flattened and then fed into the fully connected layer, and the out_features is equal to the number of classes.

Results:

```
(base) nadalaabid@Nadas-MacBook-Pro Project2-2 % Python main.py
Files already downloaded and verified
Epoch [1/1], Step [100/500] Loss: 0.6585
Epoch [1/1], Step [200/500] Loss: 0.5749
Epoch [1/1], Step [300/500] Loss: 0.5431
Epoch [1/1], Step [400/500] Loss: 0.5242
Epoch [1/1], Step [500/500] Loss: 0.5091
Accuracy of the model on the test images: 78.4 %
```

The accuracy of the model is 78.4%