**Introduction:**

In this homework, I will load opensource database CIFAR-10, and use popular popular architecture ResNet and analyst the test the set. The CIFAR-10 consists of 60000 32x32 colour images in 10 classes, with 6000 images per class. There are 50000 training images and 10000 test images.

**Methodology:**

Residual Network (ResNet) is a Convolutional Neural Network (CNN) architecture which can support hundreds or more convolutional layers. ResNet can add many layers with strong performance, while previous architectures had a drop off in the effectiveness with each additional layer.

The following pictures are from original paper about how the Resnet is built up.

图表, 图示

描述已自动生成

**Result:**

Due to time and hardware limitation, the program is running on Google Colab(free tires) with a few epochs. The source code and running output are stored in the separated file and the following table is the result collected from output.

|  |  |  |
| --- | --- | --- |
| Epoch | Accuracy | Time (s) |
| 3 | 69.11 % | 865 |
| 5 | 72.49 % | 1454 |
| 7 | 72.11 % | 2100 |
| 9 | 80.52 % | 2908 |
| 11 | 81.53 % | 3315 |

The epoch time have some limitation, but it is obviously, running time is in direct proportion to the amount of epoch value, and accuracy is also increased as the epoch increased.