Approach Report

4. Describe the approach taken for finding a solution and getting the validation set accuracy to be at least 0.93. Include in the discussion the results on the training, validation and test sets and where in the code these were calculated. Your approach may have been an iterative process, in which case, outline the steps you took to get to the final solution and why you chose those steps. Perhaps your solution involved an already well known implementation or architecture. In this case, discuss why you think the architecture is suitable for the current problem.

Following approaches were used to achieve required accuracy:
a. Model architecture select standard LeNet-5 with two dropout layers. Optimizer select Stochastic Gradient Descent optimizer.

Layer	Description
Input	32x32x3 RGB image
Convolution 5x5	1x1 stride, valid padding, outputs 28x28x6
RELU	
Max pooling	2x2 stride, outputs 14x14x6
Convolution 5x5	1x1 stride, valid padding, outputs 10x10x16
RELU	
Max pooling	2x2 stride, outputs 5x5x16
Flatten	Input = 5x5x16. Output = 400
Fully connected	Input = 400. Output = 120
RELU	
Dropout	Training:0.5 Evaluaiton:1.
Fully connected	Input = 120. Output = 84
RELU	
Dropout	Training:0.5 Evaluaiton:1.
Fully connected	Input = 84. Output = 43

During training phase dropout is used with parameter 0.5 During evaluation and test phase dropout is not used with parameter setting 1.

The dropout is selected to help solve overfitting problem. Because I found overfitting problem if dropout is not used.

b. regarding batch size, use example value 128. This gives a good result according to test results.

c. Regarding the learning rate and epochs combination: I try 4 parameters combinations: rate-0.001 & epochs 10, rate-0.005 & epochs 40, rate-0.002 & epochs 40 and rate-0.002 & epochs 10.
According to test results, the last combination gives best result.

Finally, My final model results were:
* Training set accuracy of 0.987
* Validation set accuracy of 0.948
* Test set accuracy of 0.929