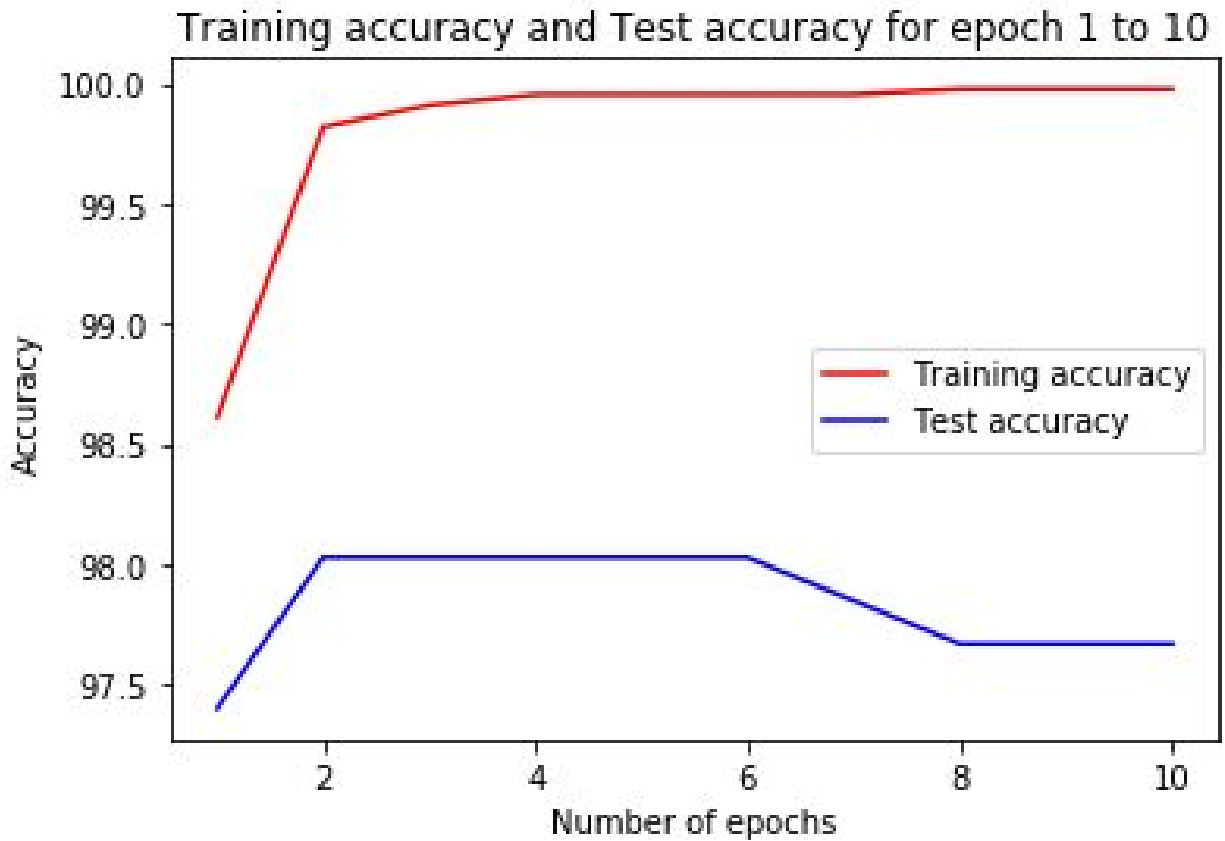


ASSIGNMENT 4: NEURAL NETWORKS

PART 1



Number of epochs----->Training Set accuracy:

1----->9.860955371159452909e+01
2----->9.982058757568961482e+01
3----->9.991029378784480741e+01
4----->9.995514689392240371e+01
5----->9.995514689392240371e+01
6----->9.995514689392240371e+01
7----->9.995514689392240371e+01
8----->9.997757344696120185e+01
9----->9.997757344696120185e+01
10----->9.997757344696120185e+01

Number of epochs----->Test Set accuracy:

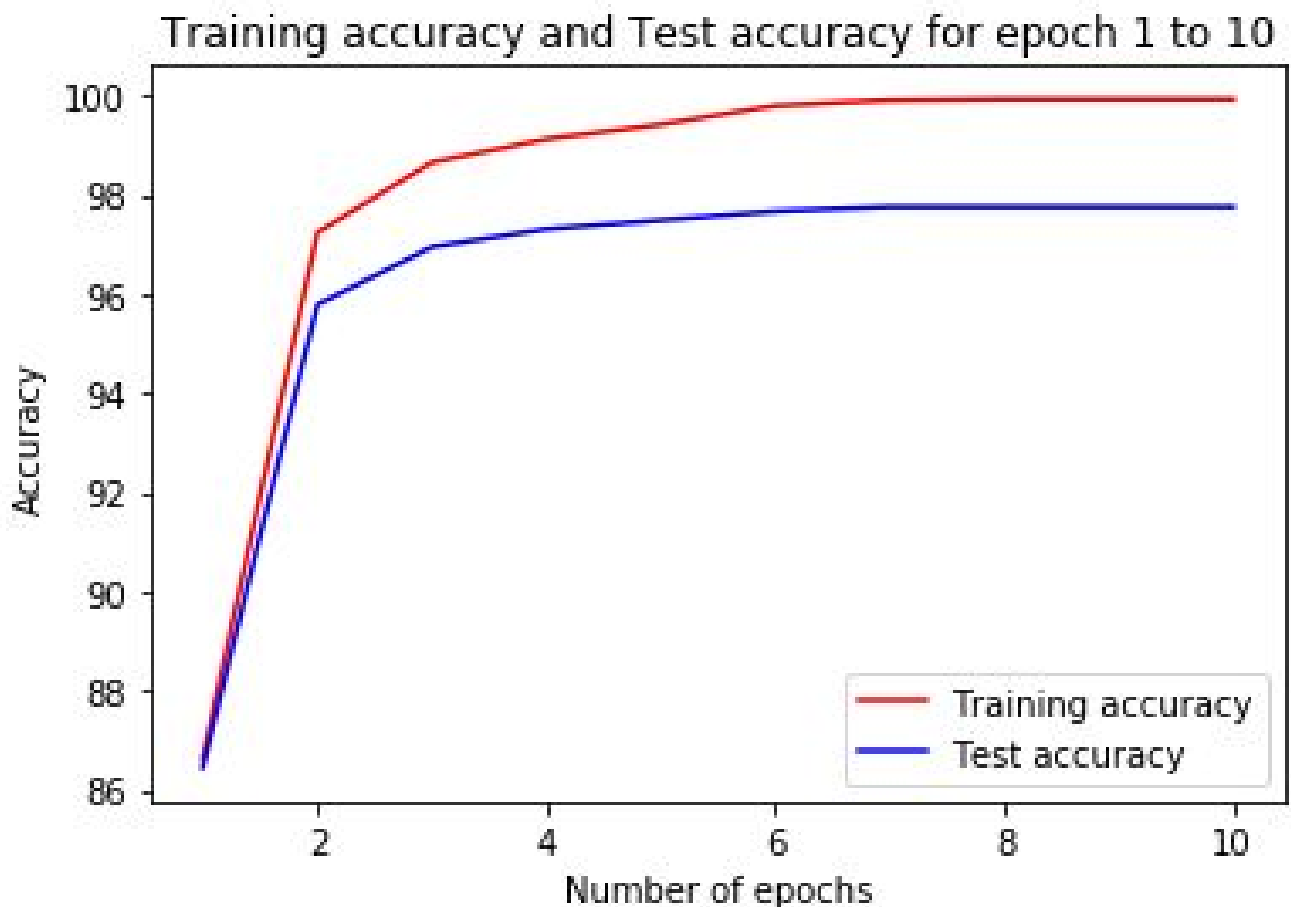
1----->9.739910313901344807e+01
2----->9.802690582959641574e+01
3----->9.802690582959641574e+01
4----->9.802690582959641574e+01
5----->9.802690582959641574e+01
6----->9.802690582959641574e+01
7----->9.784753363228699641e+01
8----->9.766816143497757707e+01
9----->9.766816143497757707e+01
10----->9.766816143497757707e+01

For number of epochs = 10

TRAINING ERROR = 0.001168898011394 (categorical cross entropy loss function averaged)

TEST ERROR = 0.132818533001 (categorical cross entropy loss function averaged)

PART 2



This is for command line inputs:
50 neurons for Hidden Layer 1
25 neurons for Hidden Layer 2

Number of epochs----->Training Set accuracy:

1----->8.663377438887643223e+01
2----->9.724153397622785633e+01
3----->9.865440681767212538e+01
4----->9.912536443148688647e+01
5----->9.941690962099126239e+01
6----->9.979816102265081668e+01
7----->9.991029378784480741e+01
8----->9.993272034088360556e+01
9----->9.993272034088360556e+01
10----->9.993272034088360556e+01

Number of epochs----->Test Set accuracy:

1----->8.645739910313901078e+01
2----->9.578475336322870248e+01
3----->9.695067264573991395e+01
4----->9.730941704035875262e+01
5----->9.748878923766815774e+01
6----->9.766816143497757707e+01
7----->9.775784753363228674e+01
8----->9.775784753363228674e+01
9----->9.775784753363228674e+01
10----->9.775784753363228674e+01

For number of epochs = 10

TRAINING ERROR = 0.00507734662337 (categorical cross entropy loss function averaged)

TEST ERROR = 0.139730710968 (categorical cross entropy loss function averaged)

C)

FINAL TEST SET ACCURACY:

PART 1 ---> 98.03% (Number of epochs required = 2)

PART 2 ---> 97.76% (Number of epochs required = 7)