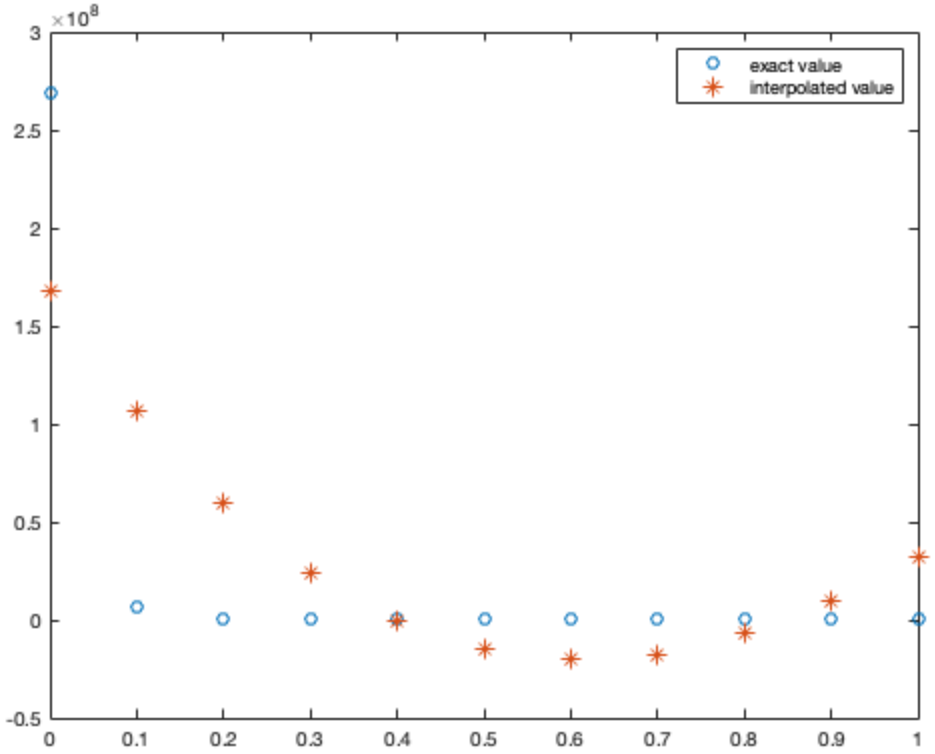
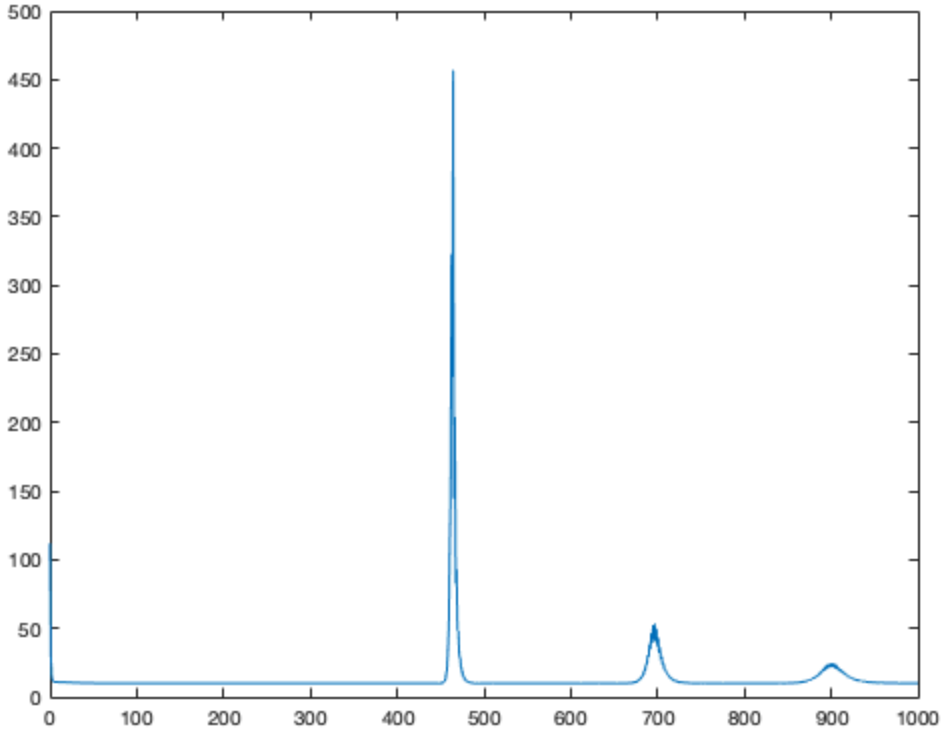
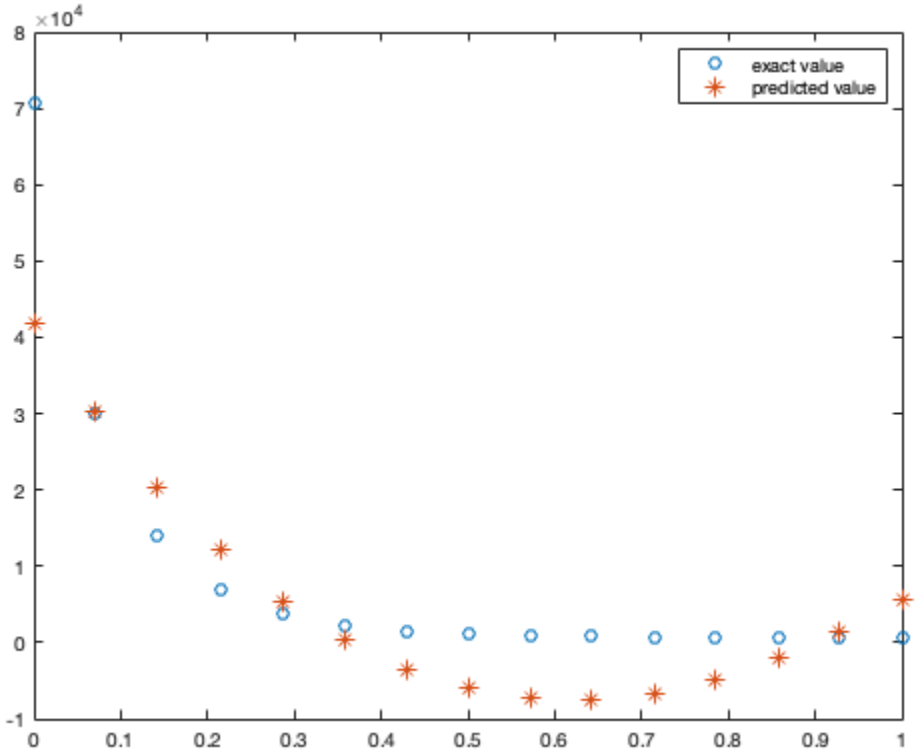
```
%close previous workspace and clean c.w. and w.s. again
close all
clc
clear all
format long e

p = [ 0.003, 0.00275, 0.0025, 0.00225, 0.002, 0.00175, 0.0015,
 0.00125, 0.001, 0.00075, 0.0005 ]
nsim = 100; %times simulation is run
period = 60; %total length of period of analysis consided

% social distancing cost
c = @(p) (0.003./p).^9 - 1;
y_c = c(p); %social distancing cost for all probabilities

% A=10;
% B=100;
% %nsim=5000;
% l=2;
% C=0.1;
% t=0.5;

S(1)=999
I(1)=1
sp = 11;

%[avg_cost_p] = reed_model_simulation(p, 999, 1, y_c, nsim, period)
%other version of rf version2
[avg_cost_p]=reed_model_simulation(p, nsim);

tol=1.0e-7;
%x_tr=x-2*ones(1,11);%normalising the input with a traslation
%new normalization using gosavi pag 56
x_tr=(p-min(p))/(max(p)-min(p));
%x_tr = x;
y = avg_cost_p; %avg_cost_p is our y

%applying the back_prop_NN.m to the test function
[W,v,b,ki,o,SSE_new]=back_propagation_NN(x_tr,y,tol);

%constructing a training set
p2=linspace(0.003,0.00125,15);
y_c2 = c(p2); %social distancing cost for all probabilities

%period2 = 60; %total length of period of analysis consided

[avg_cost_NN] = reed_model_simulation(p2, nsim)

avg_cost_NN;

%p2_tr=p2-2*ones(1,15); negative square matrix
```

```
%gosavi method to normalize to values from (0,1)
p2_tr=(p2-min(p2))/(max(p2)-min(p2));
[y_out,SSE]=NN_predict(p2_tr,avg_cost_NN,W,ki,b); %avg_cost_NN our
 y_training

%plotting the result on the training set
figure('name','prediction on a training set')
plot(p2_tr,avg_cost_NN,'o',p2_tr,y_out','*'); %showing comparisons
 between real and trained one
xlabel('')
legend('exact value', 'predicted value')

x_sp=spallMethod();


p =

  Columns 1 through 3

    3.000000000000000e-03    2.750000000000000e-03
 2.500000000000000e-03

  Columns 4 through 6

    2.250000000000000e-03    2.000000000000000e-03
 1.750000000000000e-03

  Columns 7 through 9

    1.500000000000000e-03    1.250000000000000e-03
 1.000000000000000e-03

  Columns 10 through 11

    7.500000000000000e-04    5.000000000000000e-04


S =

   999


I =

     1


avg_cost_NN =

  Columns 1 through 3

    6.954337853445511e+02    6.978482144081132e+02
 6.988643707239929e+02
```

```
  Columns 4 through 6

    7.192818769766001e+02     7.303012373182623e+02
7.792658682885054e+02

  Columns 7 through 9

    8.812235210901391e+02     1.094797259622889e+03
1.461667805972119e+03

  Columns 10 through 12

    2.258650567424259e+03     3.784025432910355e+03
6.952165923001766e+03

  Columns 13 through 15

    1.388022723680271e+04     3.006593660916619e+04
7.059506426539485e+04


x_sp =

    1.093306647649424e-02
```




500
450
400
350
300
250
200
150
100
50
0
0
100
200
300
400
500
600
700
800
900
1000


×10^4
8
7
6
5
4
3
2
1
0
-1
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
exact value
predicted value

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