

## NNFL Lab 4 – ADALINE NETWORK:

```

//truth table
//x1 x2 b t
//1 1 1 1
//1 -1 1 1
//-1 1 1 1
//-1 -1 1 -1

clc ;
clear ;
disp("Reeha Parkar - 60001180046");
disp ('Adaline network for OR function Bipolar inputs and targets') ;

// inputs
x1 =[1 1 -1 -1];
x2 =[1 -1 1 -1];

// bias
x3 =[1 1 1 1];

// target
t =[1 1 1 -1];

// weights and bias
w1 =0.1;
w2 =0.1;
b =0.1;

//learning rate
alpha =0.1;

// error:
e =0;
e1=0;

delw1 =0; delw2 =0; delb =0;
epoch =1;

//1st epoch
for i =1:4
    nety(i) = w1*x1(i) + w2*x2(i) + b ;

    nt =[ nety(i) t(i)];
    delw1 = alpha*(t(i)-nety(i)) * x1(i) ;
    delw2 = alpha*(t(i)-nety(i)) * x2(i) ;
    delb = alpha*(t(i)-nety(i)) * x3(i) ;
    // weight changes
    wc =[ delw1 delw2 delb ]
    // update weights
    w1 = w1 + delw1 ;
    w2 = w2 + delw2 ;
    b = b + delb ;
    //new weights
    w =[ w1 w2 b ];
    // input current
    x =[ x1(i) x2(i) x3(i) ];

end

for i =1:4
    e = e + (t(i)-nety(i))^2;
end;

//Error prints:
disp("Error after first epoch:");
disp(e);

```

```

//2nd epoch
for i =1:4
    nety(i) = w1*x1(i) + w2*x2(i) + b ;

    nt =[ nety(i) t(i) ];
    delw1 = alpha*(t(i)-nety(i)) * x1(i) ;
    delw2 = alpha*(t(i)-nety(i)) * x2(i) ;
    delb = alpha*(t(i)-nety(i)) * x3(i) ;
    // weight changes
    wc =[ delw1 delw2 delb ]
    // updating of weights
    w1 = w1 + delw1 ;
    w2 = w2 + delw2 ;
    b = b + delb ;
    //new weights
    w =[ w1 w2 b ];
    // input pattern
    x =[ x1(i) x2(i) x3(i) ];

end

for i =1:4
    e1 = e1 + (t(i)-nety(i))^2;
end;

//Error prints:
disp("Error after second epoch:");
disp(e1);

disp("Error difference error2-error1");
disp(e-e1);

epoch = epoch + 1;

while(e - e1) > 0.1
    epoch = epoch +1;
    e = e1;
    e1 = 0;
    for i =1:4
        nety(i) = w1*x1(i) + w2*x2(i) + b ;

        nt =[nety(i) t(i)];
        delw1 = alpha*(t(i)-nety(i)) * x1(i);
        delw2 = alpha*(t(i)-nety(i)) * x2(i);
        delb = alpha*(t(i)-nety(i)) * x3(i);
        // weight changes
        wc =[ delw1 delw2 delb ]
        // update weights
        w1 = w1 + delw1 ;
        w2 = w2 + delw2 ;
        b = b + delb ;
        //weights
        w =[ w1 w2 b ];
        // input
        x =[ x1(i) x2(i) x3(i) ];
    end

    //printing the error difference
    for i =1:4
        e1 = e1 + (t(i)-nety(i))^2;
    end

    disp("Current epoch:");
    disp(epoch);
    disp("Current epoch error") ;
    disp(e1);
    disp("Error difference");

```

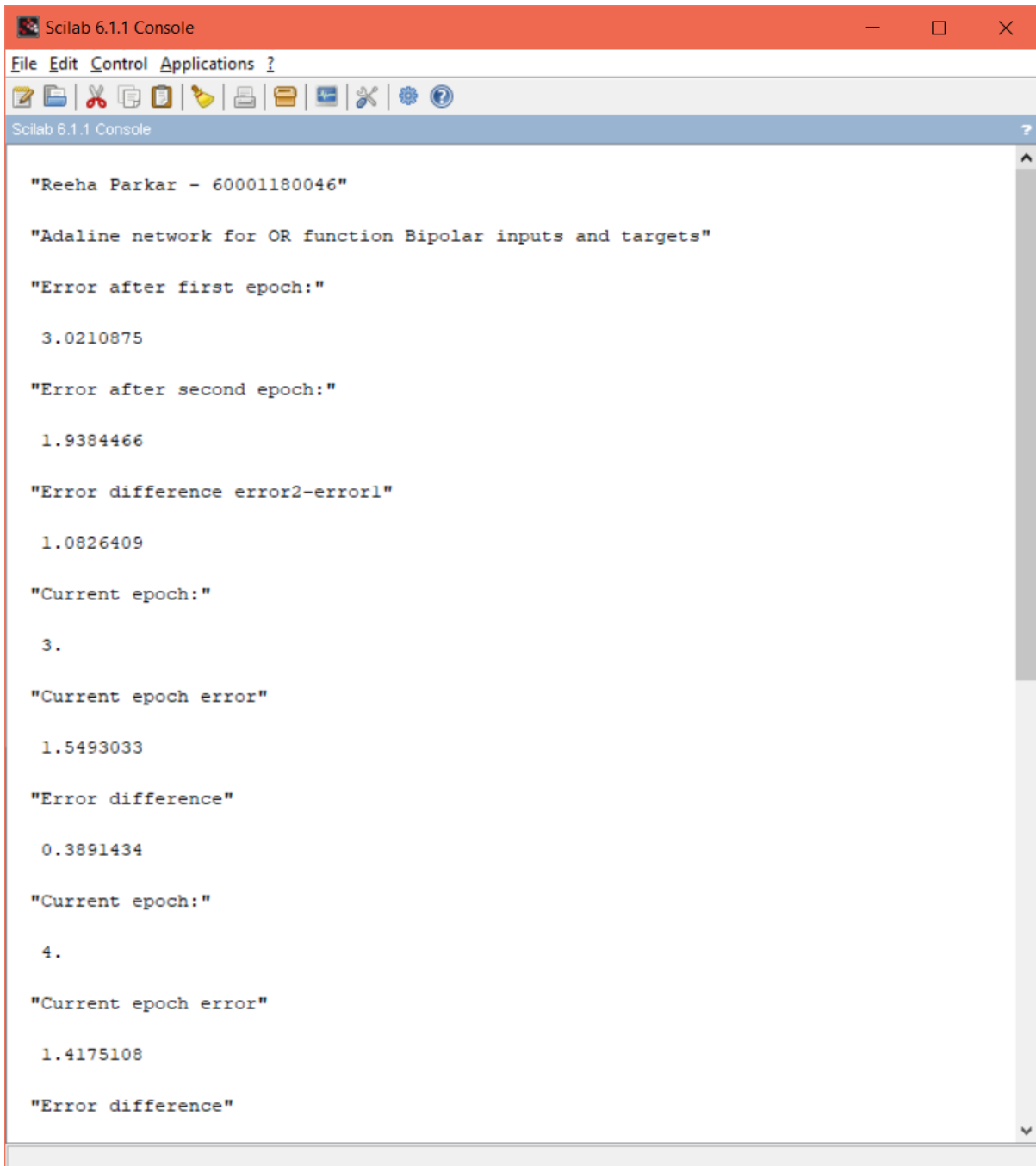
```

        disp(e-e1);
    end

    disp("Total Number of epochs ");
    disp(epoch);
    disp("The final bias is: ");
    disp(b);
    disp("The final weights are: ");
    disp("w1 =");
    disp(w1);
    disp("w2 =");
    disp(w2);

```

## OUTPUT:



```

"Reeha Parkar - 60001180046"

"Adaline network for OR function Bipolar inputs and targets"

"Error after first epoch:"

3.0210875

"Error after second epoch:"

1.9384466

"Error difference error2-error1"

1.0826409

"Current epoch:"

3.

"Current epoch error"

1.5493033

"Error difference"

0.3891434

"Current epoch:"

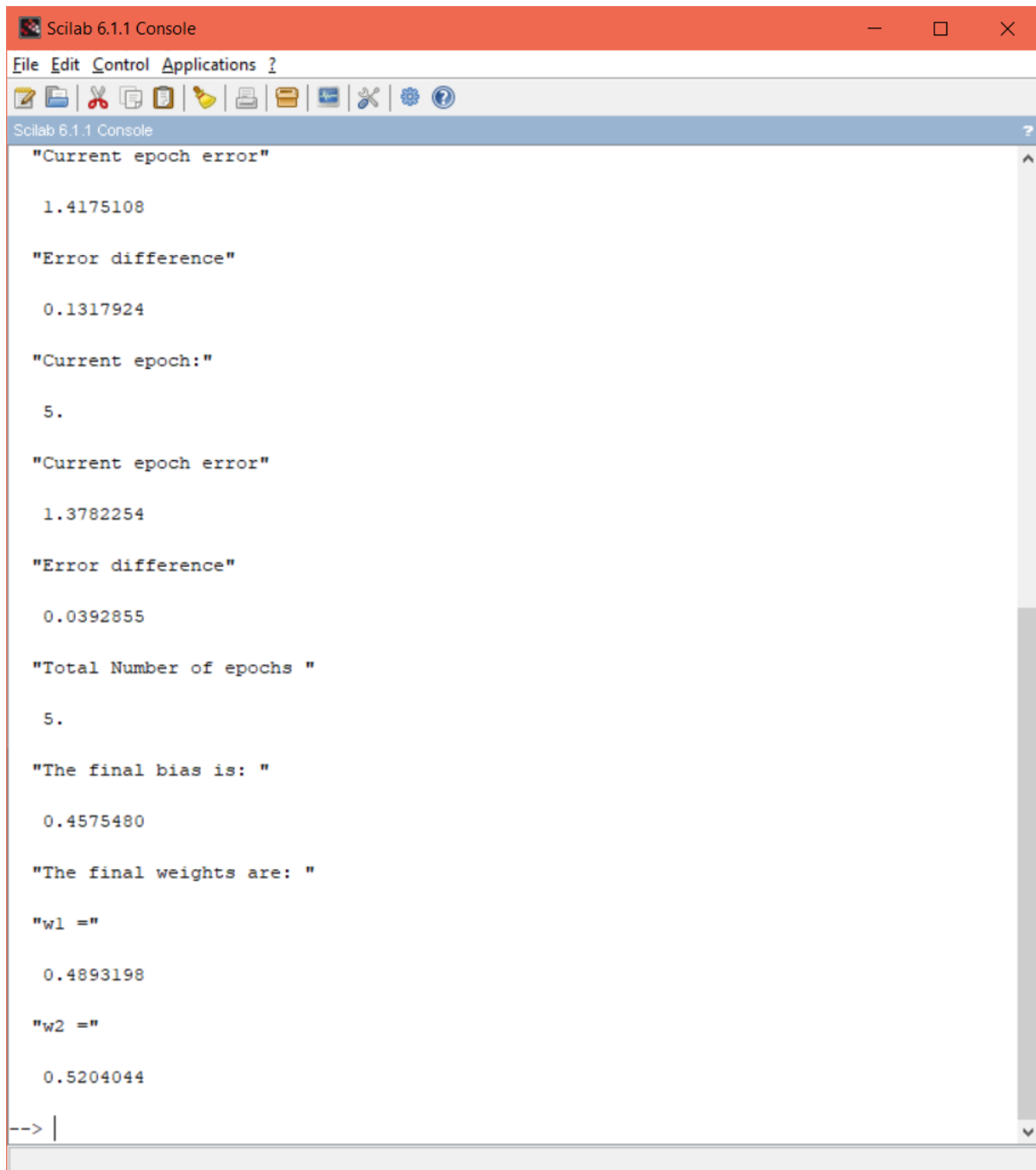
4.

"Current epoch error"

1.4175108

"Error difference"

```



The image shows a Scilab 6.1.1 Console window with a red title bar and standard window controls. The menu bar includes File, Edit, Control, and Applications. The toolbar contains icons for file operations, editing, and help. The console area displays the output of a script, showing the current epoch error, error difference, current epoch number, total number of epochs, final bias, and final weights. The output is as follows:

```
"Current epoch error"

1.4175108

"Error difference"

0.1317924

"Current epoch:"

5.

"Current epoch error"

1.3782254

"Error difference"

0.0392855

"Total Number of epochs "

5.

"The final bias is: "

0.4575480

"The final weights are: "

"w1 ="

0.4893198

"w2 ="

0.5204044

--> |
```