Assignment 1

Machine Learning - CSE475

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#include<bits/stdc++.h>
using namespace std;
int m = 1,n = 3;
double x0[100],slope[100],w[100];
void gradient_descent(double x1[],double x2[],double x3[],double
x4[],double y[],double alpha)
{
    double predictedvalue,errorr;
    for(int j=1; j<=m; j++)
    {
        x0[j] = 1;
    }
    int iteration =5;
    while(iteration<=25)
    {
        for(int j=0; j<=n; j++)
        {
            slope[j] = 0;
        }
        for(int i=1; i<m; i++)
        {
            predictedvalue = w[0] + w[1]*x1[i] + w[2]*x2[i] +
w[3]*x3[i] + w[4]*x4[i];
            errorr = predictedvalue - y[i];
            for(int j=0; j<=n; j++)
            {
                if(j==0)
                {
                    slope[j] = slope[j] + errorr*x0[i];
                }
                if(j==1)
                {
                    slope[j] = slope[j] + errorr*x1[i];
                }
                if(j==2)
                {
                    slope[j] = slope[j] + errorr*x2[i];
                }
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                if(j==3)
                {
                    slope[j] = slope[j] + errorr*x3[i];
                }
                if(j==4)
                {
                    slope[j] = slope[j] + errorr*x4[i];
                }
            }
        }
        cout<<"iteration number : "<<iteration<<" ";
        for(int j=0; j<=n; j++)
        {

            w[j] = w[j] - alpha*slope[j];
            cout<<"w"<<j<<" = "<<w[j]<<" ";
        }
        cout<<endl;
        iteration+=5;
    }
}

int main()
{
    double array1[100],array2[100],array3[100],array4[100],arry[100];
    double alphaa = 0.001;
    ifstream inpobj("point.txt");
    while(inpobj>>array1[m])
    {
        inpobj>>array4[m];
        inpobj>>array3[m];
        inpobj>>array2[m];
        inpobj>>arry[m];
        cout<<array4[m]<<" "<<array3[m]<<" "<<array1[m]<<"
"<<array2[m]<<" "<<arry[m]<<"\n";
        m++;
    }
    cout<<endl;
    cout<<"Values of W are : ";
    for(int j=0; j<=n; j++)
    {
        w[j] = 0.5;
        cout<<w[0]<<" ";
    }
    cout<<endl;
```

```
    gradient_descent(array1,array2,array3,array4,arry,alphaa);
    cout<<"So the result is --> ";
    for(int j=0; j<=n; j++)
    {
        cout<<"w"<<j<<" = "<<w[j]<<" ";
    }
}
```

Regression Parameters:

Iteration number	W0	W1	W2	W3	W4
5	0.4835	0.4585	0.4333	0.4365	0.4242
10	0.4709	0.4292	0.3811	0.3882	0.3198
15	0.4613	0.4091	0.3409	0.3515	0.3198
20	0.4539	0.3959	0.3095	0.3236	0.2844
25	0.4483	0.3879	0.2848	0.3024	0.2567