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import java.io.BufferedReader;
import java.io.File;
import java.io.FileReader;
import java.io.IOException;
import java.util.ArrayList;
import java.util.Random;

import org.uncommons.maths.random.GaussianGenerator;

public class MCMC {
    final int n = 5000;
    final int nParam = 4;
    final String filename = "data2.csv";
    private Random rand;
    // 学習データ

    private double[][] x;
    private int[] y;
    // 推定過程における現在のパラメータ値

    private double[] param;
    // パラメータサンプル

    private ArrayList<double[]> params;
    // MCMCの各種設定

    final int burnin = 1000;
    final int interval = 100;
    final double sigma = 0.01;
    // ハイパーパラメータ

    final double[] prior = {0.0, 1.0};

    MCMC() throws IOException{
        init();
        FileReader(filename);
        runMCMC();
        double[] eap = getEap();
        printResult(eap);
    }
    // 各変数の初期化
    void init(){
        rand = new Random();
        x = new double[n][nParam-1];
        y = new int[n];
        param = new double[nParam];
        params = new ArrayList<double[]>();
    }
    // データファイルの読み込み
    void FileReader(String fileName) throws IOException {
        BufferedReader br = new BufferedReader(new
FileReader(new File(fileName)));
        br.readLine();
        for(int l=0;l<n;l++){
            String line = br.readLine();
            if(line == null) break;
            String[] d = line.split(",");

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        for(int i=0;i<nParam-1;i++){
            x[l][i] = Double.valueOf(d[i]);
        }
        y[l] = Integer.valueOf(d[nParam-1]);
    }
    br.close();
}

void runMCMC(){
    /*
    *
    *
    * MCMCでパラメータをサンプルしてparamsに格納
    *
    *
    *
    */
}

// 対数尤度の計算
double getLogLikelihood(){
    double LL = 0;
    /*
    *
    * 対数尤度を計算
    *
    */
    return LL;
}

// 正規分布に基づく確率値の対数を取得（各パラメータの事前分布の計算）
double getLogGaussian(double m, double s, double v) {
    double ee = - Math.pow(v - m, 2) / (2 * s * s);
    return Math.log(Math.exp(ee) / (Math.sqrt(2 *
Math.PI) * s));
}

// EAP推定値を計算
double[] getEap(){
    /*
    *
    *
    * EAPを計算
    *
    *
    */
    return eap;
}

void printResult(double[] eap){
    System.out.println("EAP推定値:");
    System.out.println(" a = " + eap[0]);
    System.out.println(" b = " + eap[1]);
    System.out.println(" c = " + eap[2]);
}

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        System.out.println(" d = " + eap[3]);
    }
    public static void main(String args[]) throws IOException {
        new MCMC();
    }
}
```