Simplex.java

```java
package simplex;

/**
 *
 * @author tadaki
 */
public class Simplex {

    private final int n;
    private final int m;
    private final double a[][];
    private final double b[];
    private String format = "%5.2f";
    private final String nl = System.getProperty("line.separator");

    public Simplex(int n, int m, double[][] a, double b[], double c[]) {
        this.n = n;
        this.m = m;
        this.a = new double[m + 1][n + m];
        this.b = new double[m + 1];

        for (int i = 0; i < m; i++) {
            for (int j = 0; j < n; j++) {
                this.a[i][j] = a[i][j];
            }
            for (int j = n; j < n + m; j++) {
                if (j == i + n) {
                    this.a[i][j] = 1;
                }
            }
        }
        for (int j = 0; j < n; j++) {
            this.a[m][j] = -c[j];
        }

        for (int i = 0; i < m; i++) {
            this.b[i] = b[i];
        }
    }

    public double doExec(boolean debug){
        if(debug)System.out.println(showState());
        boolean end=false;
        while(!end){
            end=oneStep();
            if(debug)System.out.println(showState());
```

```
        }
        return b[m];
    }

    public boolean oneStep() {
        //評価式の最小係数の場所を求める
        int k = findMin();
        double q = a[m][k];
        if (q >= 0) {//終了
            return true;
        }
        //pivot
        int pk = findPivot(k, q);
        double p = a[pk][k];
        for (int j = 0; j < n + m; j++) {
            a[pk][j] /= p;
        }
        b[pk] /= p;
        for (int i = 0; i < m + 1; i++) {
            if (i != pk) {
                double r = a[i][k]/a[pk][k];
                for (int j = 0; j < n + m; j++) {
                    a[i][j] -= r*a[pk][j];
                }
                b[i] -=r*b[pk];
            }
        }
        return false;
    }

    private int findPivot(int kk, double q) {
        double theta[] = new double[m];
        for (int i = 0; i < m; i++) {
            theta[i] = b[i] / a[i][kk];
        }
        double p = theta[0];
        int k = 0;
        for (int i = 0; i < m; i++) {
            if (theta[i] < p) {
                p = theta[i];
                k = i;
            }
        }
        return k;
    }
```

```java
    /**
     * 評価式の最小係数の場所を求める
     *
     * @return
     */
    private int findMin() {
        int k = 0;
        double q = a[m][0];
        for (int j = 1; j < n + m; j++) {
            if (a[m][j] < q) {
                q = a[m][j];
                k = j;
            }
        }
        return k;
    }

    public void setFormat(String format) {
        this.format = format;
    }

    public String showState() {
        StringBuilder sb = new StringBuilder();
        for (int i = 0; i < m + 1; i++) {
            for (int j = 0; j < n + m; j++) {
                sb.append(String.format(format, a[i][j])).append(" ");
            }
            sb.append("| ").append(String.format(format, b[i])).append(nl);
        }
        return sb.toString();
    }
}
```

SimplexMain.java

```java
import simplex.Simplex;

/**
 *
 * @author tadaki
 */
public class SimplexMain {

    /**
     * @param args the command line arguments
     */
    public static void main(String[] args) {
        int n = 2;
        int m = 3;
        double a[][] = {{0.8,0.6},{0.2,0.8},{0.3,0.4}};
        double b[] = {8.8,6.4,4.};
        double c[]={1.,2.};
        Simplex simplex = new Simplex(n,m,a,b,c);
        double x = simplex.doExec(true);
        System.out.println("result = "+String.valueOf(x));
    }

}
```