// joi/2/linear/LinearEquation.java

/**
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 */

public class LinearEquation {
    private double m;      // The equation's slope
    private double b;      // The equation's y-intercept

    /**
     * Construct a LinearEquation from a slope and y-intercept.
     * @param m the slope.
     * @param b the y-intercept.
     */
    public LinearEquation( double m, double b ) {
        this.m = m;
        this.b = b;
    }

    /**
     * Construct a LinearEquation from two points.
     * @param x1 the x coordinate of the first point
     * @param y1 the y coordinate of the first point
     * @param x2 the x coordinate of the second point
     * @param y2 the y coordinate of the second point
     */
    public LinearEquation( double x1, double y1, double x2, double y2 ) {
        m = (y2 - y1) / (x2 - x1);
        b = y1 - x1 * m;
    }

    /**
     * Compute y, given x.
     * @param x the input value.
     * @return the corresponding value of y: mx+b.
     */
    public double compute( double x ) {
        return m*x + b;
    }

    /**
     * Compute the inverse of this linear equation.
     * @return the LinearEquation object you get by "solving for x".
     */
    public LinearEquation getInverse() {
        return new LinearEquation( 1.0/m, -b/m );
    }
}