

ใบงานที่ 7

วัตถุประสงค์ เพื่อ ทดลองใช้ regression

```

static void LinearRegression() {
    // https://introc.cs.princeton.edu/java/97data/LinearRegression.java.html
    double[] x = x_RadioAds();
    double[] y = y_Revenue();
    // first pass : compute xbar and ybar
    // sumxsqr is for other statistic param
    double sumx = 0.0, sumy = 0.0, sumxsqr = 0.0;
    for (int i = 0; i < x.length; i++) {
        sumx += x[i];
        // sumxsqr += (x[i] * x[i]);
        sumy += y[i];
    }
    double xbar = sumx / x.length;
    double ybar = sumy / y.length;

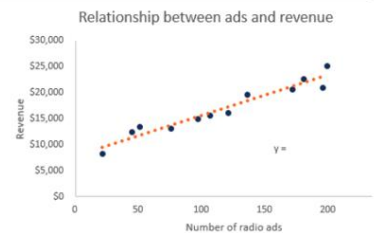
    // second pass : compute summary stat
    double xxbar, yybar, xybar; // yybar for R²
    xxbar = yybar = xybar = 0.0;
    for (int i = 0; i < x.length; i++) {
        xxbar += (x[i] - xbar) * (x[i] - xbar);
        yybar += (y[i] - ybar) * (y[i] - ybar);
        xybar += (x[i] - xbar) * (y[i] - ybar);
    }
    double beta1 = xybar / xxbar;
    double beta0 = ybar - beta1 * xbar;
    System.out.printf(" y = %.4f * x + %.4f\n", beta1, beta0);

    // third pass : R-squared determines the proportion of variance in the
    // dependent variable that can be explained by the independent variable.
    int df = x.length - 2;
    double rss = 0.0; // residual sum of squares
    double ssr = 0.0; // regression sum of squares

    for (int i = 0; i < x.length; i++) {
        double fit = beta1 * x[i] + beta0;
        rss += (fit - y[i]) * (fit - y[i]);
        ssr += (fit - ybar) * (fit - ybar);
    }
    double R2 = ssr / yybar;
    System.out.printf("R² = %.4f\n", R2);
    //more codes
}

```

Data	Radio ads	Revenue
Jan	21	\$8,350.0
Feb	180	\$22,755.0
Mar	50	\$13,455.0
Apr	195	\$21,100.0
May	96	\$15,000.0
Jun	44	\$12,500.0
Jul	171	\$20,700.0
Aug	135	\$19,722.0
Sep	120	\$16,115.0
Oct	75	\$13,100.0
Nov	106	\$15,670.0
Dec	198	\$25,300.0



Regression – “while there are shorter and taller people, only outliers are very tall or short, and most people cluster somewhere around (or “regress” to) the average” -

<https://www.investopedia.com/terms/r/regression.asp#toc-example-of-how-regression-analysis-is-used-in-finance>

คำสั่ง

$$y = 76.0753 * x + 7930.3547$$

กำหนดส่ง TBA