216	$\overline{Y} \leftarrow$

Лістинг

```
package com.company;

public class Lab1 {
    public static void main(String[] args) {
        int x1[] = new int[8];
        int x2[] = new int[8];
        int x3[] = new int[8];
        double var206[] = new double[8];
        double xn1[] = new double[8];
        double xn2[] = new double[8];
        double xn3[] = new double[8];
        int Y[] = new int[8];
        int a[] = {1 + (int) (Math.random() * 20), 1 + (int) (Math.random() * 20), 1 +
(int) (Math.random() * 20),
                1 + (int) (Math.random() * 20)};
        for (int i = 0; i < x1.length; i++) {
            x1[i] = 1 + (int) (Math.random() * 20);
            x2[i] = 1 + (int) (Math.random() * 20);
            x3[i] = 1 + (int) (Math.random() * 20);
            Y[i] = a[0] + a[1] * x1[i] + a[2] * x2[i] + a[3] * x3[i];
        }
        double max1 = 0;
        double max2 = 0;
        double max3 = 0;
        double min1 = x1[0];
        double min2 = x2[0];
        double min3 = x3[0];
        for (int i = 0; i < x1.length; i++) {
            if (x1[i] > max1) max1 = x1[i];
            else if (x1[i] < min1) min1 = x1[i];
            if (x2[i] > max2) max2 = x2[i];
            else if (x2[i] < min2) min2 = x2[i];
            if (x3[i] > max3) max3 = x3[i];
            else if (x3[i] < min3) min3 = x3[i];
        }
        double x01 = (max1 + min1) / 2;
        double x02 = (max2 + min2) / 2;
        double x03 = (max3 + min3) / 2;

        double xd1 = x01 - min1;
```

```
        double xd2 = x02 - min2;
        double xd3 = x03 - min3;

        for (int i = 0; i < xn1.length; i++) {
            xn1[i] = (x1[i] - x01) / xd1;
            xn2[i] = (x2[i] - x02) / xd2;
            xn3[i] = (x3[i] - x03) / xd3;
        }

        double Yet = a[0] + a[1] * x01 + a[2] * x02 + a[3] * x03;

        double minvar = Math.pow(Y[0] - Yet, 2);

        for (int i = 0; i < var206.length; i++) {
            var206[i] = Math.pow(Y[i] - Yet, 2);
            if (var206[i] < minvar) minvar = var206[i];
        }

        System.out.println("a[0] + x1[i] * a[1] + x2[i] * a[2] + x3[i] * a[3] = Y[i]");

        for (int i = 0; i < x1.length; i++) {
            System.out.println(a[0] + " + " + x1[i] + " * " + a[1] + " + " + x2[i] + " * "
+ a[2] + " + "
                    + x3[i] + " * " + a[3] + " = " + Y[i] + ";  Xn1 = " + xn1[i] + "; Xn2 = "
+ xn2[i] + "; Xn3 = " + xn3[i]);

        }

        double sumY = 0;
        for (int i = 0; i < Y.length; i++) {
            sumY += Y[i];
        }

        double Yaverage = sumY / Y.length;

        double var216 = Yaverage * 2;// задано таке значення для того щоб
пошук виконувався коректно а саме умова Y[i]<var216
        for (int i = 1; i < Y.length; i++) {
            if ((Y[i] > Yaverage) && (Y[i] < var216)) {
                var216 = Y[i];
            }
        }
        System.out.println("\nx01 = " + x01 + "; x02 = " + x02 + "; x03 = " + x03);
        System.out.println("\nxd1 = " + xd1 + "; xd2 = " + xd2 + "; xd3 = " + xd3);
        System.out.println("\na[0] + x01 * a[1] + x02 * a[2] + x03 * a[3] = Yet");
```

```
        System.out.println(a[0] + " + " + x01 + " * " + a[1] + " + " + x02 + " * " +
a[2] + " + " + x03 + " * " + a[3] + " = " + Yet);
        System.out.println("\nmin(Y[i]-Yet)^2 = " + minvar);
        System.out.println("\nAdditional task");
        System.out.println("\nYaverage = " + Yaverage);
        System.out.println("\nY ← " + var216);


    }
}
```

Результати роботи програми

```
C:\Users\Andrew\.jdks\openjdk-14.0.2-1\bin\java.exe "-javaagent:D:\IntelliJ IDEA 2020.1.2\lib\idea_rt.jar=64929:D:\IntelliJ
a[0] + x1[i] * a[1] + x2[i] * a[2] + x3[i] * a[3] = Y[i]
8 + 15 * 1 + 7 * 11 + 5 * 18 = 190;  Xn1 = 0.4444444444444444; Xn2 = -0.3333333333333333; Xn3 = -0.5294117647058824
8 + 20 * 1 + 7 * 11 + 1 * 18 = 123;  Xn1 = 1.0; Xn2 = -0.3333333333333333; Xn3 = -1.0
8 + 3 * 1 + 11 * 11 + 8 * 18 = 276;  Xn1 = -0.8888888888888888; Xn2 = 0.2; Xn3 = -0.17647058823529413
8 + 2 * 1 + 10 * 11 + 7 * 18 = 246;  Xn1 = -1.0; Xn2 = 0.06666666666666667; Xn3 = -0.29411764705882354
8 + 6 * 1 + 2 * 11 + 11 * 18 = 234;  Xn1 = -0.5555555555555556; Xn2 = -1.0; Xn3 = 0.17647058823529413
8 + 5 * 1 + 17 * 11 + 16 * 18 = 488;  Xn1 = -0.6666666666666666; Xn2 = 1.0; Xn3 = 0.7647058823529411
8 + 5 * 1 + 11 * 11 + 15 * 18 = 404;  Xn1 = -0.6666666666666666; Xn2 = 0.2; Xn3 = 0.6470588235294118
8 + 2 * 1 + 2 * 11 + 18 * 18 = 356;  Xn1 = -1.0; Xn2 = -1.0; Xn3 = 1.0

x01 = 11.0; x02 = 9.5; x03 = 9.5

xd1 = 9.0; xd2 = 7.5; xd3 = 8.5

a[0] + x01 * a[1] + x02 * a[2] + x03 * a[3] = Yet
8 + 11.0 * 1 + 9.5 * 11 + 9.5 * 18 = 294.5

min(Y[i]-Yet)^2 = 342.25

Additional task

Yaverage = 289.625

Y ← 356.0
```