

Answer on Question #43969, Math, Algorithms | Quantitative Methods

Problem.

a sample of 6 students was selected and data about their anxiety in taking exams and tests for the spring exam 2014 and the data was recorded as shown in the table..

anxiety score test score after exam (%)

10 2

8 3

2 9

1 7

5 6

6 5

Remark. The question is missed in the problem statement. From the question topic and problem statement I suppose that the question is to find function which approximates the test score by anxiety score.

Solution. The polynomial that approximates this function by Lagrange's interpolation formula is equal to

$$\begin{aligned}
 P(x) &= 2 \frac{(x-8)(x-2)(x-1)(x-5)(x-6)}{(10-8)(10-2)(10-1)(10-5)(10-6)} \\
 &+ 3 \frac{(x-10)(x-2)(x-1)(x-5)(x-6)}{(8-10)(8-2)(8-1)(8-5)(8-6)} \\
 &+ 9 \frac{(x-10)(x-8)(x-1)(x-5)(x-6)}{(2-10)(2-8)(2-1)(2-5)(2-6)} \\
 &+ 7 \frac{(x-10)(x-8)(x-2)(x-5)(x-6)}{(1-10)(1-8)(1-2)(1-5)(1-6)} \\
 &+ 6 \frac{(x-10)(x-8)(x-2)(x-1)(x-6)}{(5-10)(5-8)(5-2)(5-1)(5-6)} \\
 &+ 5 \frac{(x-10)(x-8)(x-2)(x-1)(x-5)}{(6-10)(6-8)(6-2)(6-1)(6-5)} \\
 &= \frac{11x^5}{4032} - \frac{821x^4}{10080} + \frac{6269x^3}{6720} - \frac{12769x^2}{2520} + \frac{59513x}{5040} - \frac{25}{42}
 \end{aligned}$$