Határozza meg az alábbi adatokat négyzetesen legjobban illesztő egyenes egyenletét!

t_i	0	1	1	2
f_i	$1/2$	1	$3/2$	$5/2$

$m = 4$ (ennyi adatunk van)

$$\sum_{i=1}^{m} t_i = 4 \qquad \sum_{i=1}^{m} t_i^2 = 6$$

$$\sum_{i=1}^{m} f_i = \frac{1}{2} + \frac{2}{2} + \frac{3}{2} + \frac{5}{2} = \frac{11}{2}$$

$$\sum_{i=1}^{m} f_i \cdot t_i = 0 \cdot \frac{1}{2} + 1 \cdot \frac{2}{2} + 1 \cdot \frac{3}{2} + 2 \cdot \frac{5}{2} = \frac{2}{2} + \frac{3}{2} + \frac{10}{2} = \frac{15}{2}$$

$$\begin{pmatrix} m & \Sigma t_i \\ \Sigma t_i & \Sigma t_i^2 \end{pmatrix} \cdot \begin{pmatrix} a \\ b \end{pmatrix} = \begin{pmatrix} \Sigma f_i \\ \Sigma f_i \cdot t_i \end{pmatrix}$$

$$\underbrace{\begin{pmatrix} 4 & 4 \\ 4 & 6 \end{pmatrix}}_{A} \cdot \begin{pmatrix} a \\ b \end{pmatrix} = \begin{pmatrix} 11/2 \\ 15/2 \end{pmatrix}$$

$$\det(A) = 4 \cdot 6 - 4 \cdot 4 = 24 - 16 = 8$$

$$\frac{1}{\det(A)} \cdot \begin{pmatrix} a_4 & -a_2 \\ -a_3 & a_1 \end{pmatrix} \cdot \begin{pmatrix} \Sigma f_i \\ \Sigma f_i \cdot t_i \end{pmatrix} = \begin{pmatrix} a \\ b \end{pmatrix}$$

$$\frac{1}{8} \cdot \begin{pmatrix} 6 & -4 \\ -4 & 4 \end{pmatrix} \cdot \begin{pmatrix} 11/2 \\ 15/2 \end{pmatrix} = \begin{pmatrix} a \\ b \end{pmatrix}$$

$$a = \frac{6 \cdot \frac{11}{2} - 4 \cdot \frac{15}{2}}{8} = \frac{33 - 30}{8} = \frac{3}{8}$$

$$b = \frac{-4 \cdot \frac{11}{2} + 4 \cdot \frac{15}{2}}{8} = \frac{-22 + 30}{8} = \frac{8}{8} = 1$$

$$F(t) = a + b \cdot t = \frac{3}{8} + t$$