Math of fillMatrix(

$$\sum \begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 1 & h & h^2 & h^3 \\ 0 & 1 & 2h & 3h^2 \end{pmatrix} \begin{pmatrix} 1 \\ x \\ x^2 \\ x^3 \end{pmatrix} = \varphi(j)$$

for coefficent u

$$A_{i,i} = \int_0^h \left(\frac{d^2\varphi(1)}{d\varphi(1)^2}\right)^2 dx + \int_0^h \left(\frac{d^2\varphi(3)}{d\varphi(3)}\right)^2 dx$$

$$A_{i,i-1} = \int_0^h \varphi(1)'' \varphi(3)'' dx$$

for coefficent du

$$A_{i,i} = \int_0^h \left(\varphi(2)''\right)^2 dx + \int_0^h \left(\varphi(4)''\right)^2 dx$$

$$A_{i,i-1} = \int_0^h \varphi(2)'' \varphi(4)'' dx$$

for coefficents involving u + du

$$A_{i,i} = \int_0^h \varphi(3)'' \varphi(4)'' dx + \int_0^h \varphi(1)'' \varphi(2)'' dx$$

$$A_{i,i-1} = \int_0^h \varphi(2)'' \varphi(3)'' dx$$