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Assembly of  $A$  &  $b \Rightarrow A\mathbf{q} = b$

Solution of system of equation  $\rightarrow \mathbf{q} = (q_j)$

Which gives  $U(x) = \sum_{j=1}^n q_j \phi_j(x)$

Solution of  $A\mathbf{q} = b$  by :

- (1) Direct methods
- (2) Iterative methods

For large systems (2) is the only option.

Compare with Puffin where FEM  
in 2D is implemented for DE  
in variational form :

[www.fenics.org/puffin](http://www.fenics.org/puffin)

Puffin is used for the Computer  
Projects  $A+B$ .