

C++ code 9.11.7: Utility function `initAbig()` → [GitLab](#)

```
2  If :: assemble :: COOMatrix<double> initAbig(  
3      std :: shared_ptr<const If :: uscalfe :: FeSpaceLagrangeO1<double>> fe_space) {  
4      const If :: assemble :: DofHandler &dofh = fe_space->LocGlobMap();  
5      // Diffusion coefficient =1, reaction coefficient = 0  
6      If :: mesh :: utils :: MeshFunctionConstant alpha(1.0), gamma(0.0);  
7      If :: uscalfe :: ReactionDiffusionElementMatrixProvider entity_matrix_provider(  
8          fe_space, alpha, gamma);  
9      // Compute Galerkin matrix for -Laplacian on full FE space  
10     If :: assemble :: COOMatrix<double> A =  
11         If :: assemble :: AssembleMatrixLocally<If :: assemble :: COOMatrix<double>,  
12             decltype(entity_matrix_provider)>(  
13             0, dofh, entity_matrix_provider);  
14     // Find mesh nodes on the boundary  
15     const If :: mesh :: utils :: CodimMeshDataSet<bool> bd_flags =  
16         If :: mesh :: utils :: flagEntitiesOnBoundary(fe_space->Mesh(), 2);  
17     // Predicate for selecting matrix rows induced by test functions associated  
18     // with nodes on the boundary  
19     auto pred = [&bd_flags, &dofh](int i, int j) {  
20         return bd_flags(dofh.Entity(i));  
21     };  
22     // Set the corresponding triplets to zero using LehrFEM++ helper function  
23     A.setZero(pred);  
24     // Set "boundary block" to the identity matrix  
25     for (int i = 0; i < dofh.NumDofs(); ++i) {  
26         if (bd_flags(dofh.Entity(i))) A.AddToEntry(i, i, 1.0);  
27     }  
28  
29     return A;  
30 }
```