

C++ code 9.4.14: Sub-problem (9-4.c): function `getA_full()` → [GitLab](#)

```
2  Eigen::SparseMatrix<double> getA_full(unsigned int N, double c, double h) {
3      std::vector<Eigen::Triplet<double>> triplets;
4      triplets.reserve(3 * (N + 1) - 2); // that many triplets needed
5      const double scale = c * c / h;
6      // store first row separately
7      triplets.push_back(Eigen::Triplet<double>(0, 0, scale));
8      triplets.push_back(Eigen::Triplet<double>(0, 1, -scale));
9      // loop over interior rows
10     for (unsigned i = 1; i < N; ++i) {
11         triplets.push_back(Eigen::Triplet<double>(i, i - 1, -scale));
12         triplets.push_back(Eigen::Triplet<double>(i, i, 2.0 * scale));
13         triplets.push_back(Eigen::Triplet<double>(i, i + 1, -scale));
14     }
15     // store last row separately
16     triplets.push_back(Eigen::Triplet<double>(N, N - 1, -scale));
17     triplets.push_back(Eigen::Triplet<double>(N, N, scale));
18     // Creat (N+1)x(N+1) sparse matrix in CRS format
19     Eigen::SparseMatrix<double> A(N + 1, N + 1);
20     A.setFromTriplets(triplets.begin(), triplets.end());
21     return A;
22 }
```