

```

1  /*****
2  File name: CGM.cpp
3  Description: Conjugate Gradient Method
4  *****/
5
6  #include "CGM.h"
7  #include <stdio.h>
8
9  Matrix CGM(Matrix x0, Matrix Q, Matrix b){
10
11      Matrix s0(b - Q * x0);
12      Matrix p0(s0);
13
14      double err = 1;
15      while(err > 1e-10)
16      {
17          double a = (s0.Trans() * s0 ).get(0,0) / ( p0.Trans() * Q * p0 ).get(0,0);
18          x0 = (x0 + p0 * a) ;
19          err = (s0.Trans() * s0 ).get(0,0);
20          s0 = (s0 - Q * p0 * a) ;
21          double b = ( s0.Trans() * s0 ).get(0,0) / err;
22          p0 = (s0 + p0 * b) ;
23      }
24      return x0;
25  }
26

```