**Algorithm 1: Gaussian Elimination**

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| Method introduction: |
| 简单叙述这个方法的计算思想，计算公式，适用对象，优缺点等内容。这部分属于偏数学的东西。  （英文书写不要超过1页）  To solve the equation :Ax=b  The compute ideas is transform the coefficient matrix into a triangular matrix. Then we can solve the equation with the back substitution method.  The compute formula is :subtracting a multiple of row i from row j and making this the new row j; interchanging rows I and j; and multiplying a row by a nonzero scalar;  This method suitable object is that the main diagonal isn’t zeros;  The advantage of this method is easy to operate. This method may be occurred error because the main diagonal is closed to the zeros, |
| Algorithm Design |
| 算法设计和实施部分，这部分叙述计算机编程，怎么去实现。  可以是流程图，也可以伪代码，也可以用  step 1  step 2  step 3…  叙述，要求做到别人看了这部分也能编程实现。  需要说清楚输入变量，输出变量含义。  （英文书写最多不要超过2页）  Step 1:if one of the main diagonal of matrix is the zeros ,we can’t go on the Gaussian Elimination.  Step2: input: A,b;  compute the m:  m = A(i, k)/A(k, k);  k=1 2……n-1,  i=k+1……n.  compute updated elements :  A(i, j) = A(i, j) - m\*A(k, j);  j=k,k+1……n.  compute the b:  b(i) = b(i) - m\*b(k);  Step3: output:x;  Backward substitution :  x(n) = b(n) / A(n,n);  b(i) = b(i) - A(i, j)\*x(j);  x(i) = b(i)/A(i, i); |
| Matlab code |
| 此处是程序，直接从函数窗口拷贝过来  需要是function格式，关键部分最好有注释  此处长短不限，但代码最好优化一下，条例清楚  考虑到学生是初学代码，尽量不要用高级命令  function [x] = MyGauss(A, b)  % This is the code for Gaussian Elimination without Pivoting.  % Input:  % A n by p coefficient matrix  % b n by 1 right-hand-side matrix  % Output:  % x p by 1 solution matrix    % Get size of input  [n, p] = size(A);    % Check for zero diagonal elements  if any(diag(A) == 0)  error('Division by zero will occur.')  end    % Gaussian elemination process.  for k = 1 : n-1  for i = k+1 : n  m = A(i, k)/A(k, k);  for j = k : n  A(i, j) = A(i, j) - m\*A(k, j);  end  b(i) = b(i) - m\*b(k);  end  end    % Backward substitution  x(n) = b(n) / A(n,n);    for i = n-1 : -1 : 1  for j = i+1 : n  b(i) = b(i) - A(i, j)\*x(j);  end  x(i) = b(i)/A(i, i);  end |
| Examples and Result |
| 此处需要展示你的程序对课本中的例题习题的计算结果  最好是书上的例题，这样结果正确能保证程序正确，也可以和其它的算法进行结果比较。  要求：迭代列出初值，前5次结果和最后3次结果，中间用省略号。一个方法可以展示一个例子，最多展示3个同类例子。  A=[1 2 2;4 4 12;4 8 12];  >> b=[1 12 8]';  >> [x]=MyGauss(A,b)  x =  1 -1 1  Remarks |
| 此处写该方法程序设计的一些注意事项，也可以空白 |
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