Algorithm 4: Power and inverse power method

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| Method introduction: |
| The power method computes the largest eigenvalue and the eigenvector,first,we compute eigenvalue and eigenvector of a n\*n matrix A,  Choose a initial vector x0,  X0,x1=Ax0,x2=Ax1,….,xn=Ax(n-1) |
| Algorithm Design |
| The limit of above digit series is the abs largest eigenvalue and eigenvector. |
| Matlab code |
| function [lamda,uk]=powerz(A,u0,err)  % u0ÊÇ³õÊ¼ÏòÁ¿  %·µ»ØÖµ£ºlamdaÎªÖ÷ÌØÕ÷Öµ£¬ukÎªlamda¶ÔÓ¦µÄÌØÕ÷ÏòÁ¿  [m,n]=size(A);  if(m~=n)  error('ÇëÊäÈëÒ»¸ö·½Õó£¡')  end  count=0 %¼ÇÂ¼µü´ú´ÎÊý  u1=A\*u0;    lamda0=0;  while 1  [m,p]=max(abs(u1));  if m==0  error('¸÷·ÖÁ¿ÒÑÈ«Îª0')  end  uk=A\*u1;  count=count+1;  lamda=uk(p)/u1(p);  if abs(lamda-lamda0)<err  break  end  lamda0=lamda;  u1=uk/uk(p);  end  uk=uk/uk(p);  % fprintf('/n µü´ú´ÎÊýÎª%d/n',count)    A=[6 -12 6;-21 -3 24;-12 -12 51];u0=[1;0;0];err=10^(-6);  [lamda,uk]=powerz(A,u0,err) |
| Examples and Result |
| lamda =  45.0000  uk =  -0.0000  0.5000  1.0000  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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