Calculul unui determinant prin *metoda lui Gauss*

Exemplu:

$$\Delta = \begin{vmatrix} 1 & 2 & 3 & 4 \\ 2 & 4 & 1 & 3 \\ -1 & 0 & 1 & 3 \\ 0 & -4 & 2 & 1 \end{vmatrix} \overset{\substack{L2 \leftarrow L2-2\times L1; \\ L3 \leftarrow L3+L1}}{=\!=\!=\!=\!=} \begin{vmatrix} 1 & 2 & 3 & 4 \\ 0 & 0 & -5 & -5 \\ 0 & 2 & 4 & 7 \\ 0 & -4 & 2 & 1 \end{vmatrix} \overset{L2 \leftrightarrow L3}{=\!=\!=} - \begin{vmatrix} 1 & 2 & 3 & 4 \\ 0 & 2 & 4 & 7 \\ 0 & 0 & -5 & -5 \\ 0 & -4 & 2 & 1 \end{vmatrix}$$

$$\overset{L4 \leftarrow L4+2\times L2}{=\!=\!=\!=\!=} - \begin{vmatrix} 1 & 2 & 3 & 4 \\ 0 & 2 & 4 & 7 \\ 0 & 0 & -5 & -5 \\ 0 & 0 & 10 & 15 \end{vmatrix} \overset{L4 \leftarrow L4+2\times L3}{=\!=\!=\!=\!=} - \begin{vmatrix} 1 & 2 & 3 & 4 \\ 0 & 2 & 4 & 7 \\ 0 & 0 & -5 & -5 \\ 0 & 0 & 0 & 5 \end{vmatrix}$$

$$= -1 \times 2 \times (-5) \times 5 = 50$$

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...
double det(double A[nmax][nmax], int n)
{ int i,j,k;
  double d=1,aux; // d=det(A)
  for(i=1;i<=n-1;i++)  // A[i][i]=pivot
  {  if  (A[i][i]==0)  // cautam k>i: A[k][i]<>0
     {     k=i+1;
           while((A[k][i]==0)&&(k<=n)) k++;
           if (k<=n)    // exista k, interschimbam liniile i si k
           {     d=-d;
                 for(j=i;j<=n;j++)
                 {  aux=A[i][j]; A[i][j]=A[k][j]; A[k][j]=aux;
                 }
           }
           else  // nu exista k, det=0
           {  d=0; return d;
           }
     }
      if (d!=0)  // A[i][i]<>0, transformam in 0 elementele de sub
                 // pivotul A[i][i]
     {     for(k=i+1;k<=n;k++) // din linia k scadem
                                 // (A[k][i]/A[i][i])X(linia i)
           {     double x=A[k][i]/A[i][i];
                 for(j=i;j<=n;j++) A[k][j]=A[k][j]-x*A[i][j];
           }
           d=d*A[i][i]; // inmultim elementul diagonal A[i][i] la det(A)
     }
  }
  d=d*A[n][n]; // inmultim si elementul diagonal A[n][n] la det(A)
  return d;
}
```