# VIVEKANANDA COLLEGE
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# KOLKATA-700063

NAAC ACCREDITED 'A' GRADE

Topic: Inverse of a matrix

Course Title: Computer Practical

Paper: PHY 425

Unit: N.A.

Semester: M.Sc. Second Semester

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Name of the Department: Physics

# Inverse of a matrix

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c      Inverse of a Matrix using Subroutine
       Dimension a(10,10), b(10,10)
       Write(*,*)"Enter the order of matrix"
       Read(*,*)n
       Write (*,*)"Enter the matrix"
       Do i = 1,n
       Read(*,*)(a(i,j), j = 1,n)
       End do
        Do i = 1,n
       Do j = 1,n
        b(i,j)=0.0
        End do
        b(i,i)=1.0
        End do
        Call Matrix(n,a,b)
        Write(*,*)"Inverse matrix is"
        Do i = 1,n
       write(*,*)(b(i,j), j = 1,n)
       end do
       Stop
       End

       Subroutine Matrix(n,a,b)
       Dimension a(10,10), b(10,10)
       Do k = 1,n
       do i = 1,n
        If(i.ne.k)then
       ratio = a(i,k)/a(k,k)
       do j = 1,n
       a(i,j)= a(i,j)-ratio*a(k,j)  !To calculate determinant
       b(i,j)= b(i,j)-ratio*b(k,j)    !To obtain adjoint matrix
       end do
       end if
       end do
       end do
       do i =1,n
        do j = 1,n
        b(i,j)=b(i,j)/a(i,i)
        end do
       end do
       Return
       End
```

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Try some examples:

1. $\begin{pmatrix} 1 & 2 & -3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{pmatrix}$ Ans: $\begin{pmatrix} -0.166 & -2.333 & 1.5 \\ 0.333 & 1.666 & -1.0 \\ -0.166 & 0.333 & -0.166 \end{pmatrix}$

2. $\begin{pmatrix} 1 & 1 & 1 & 1 \\ 1 & 2 & 3 & 4 \\ 1 & 4 & 9 & 16 \\ 1 & 8 & 27 & 64 \end{pmatrix}$ Ans: $\begin{pmatrix} 4.0 & -4.333 & 1.5 & -0.166 \\ -6.0 & 9.5 & -4.0 & 0.5 \\ 4.0 & -7.0 & 3.5 & -0.5 \\ -1.0 & 1.833 & -1.0 & 0.166 \end{pmatrix}$

**You can use format to write the output**