**Practical : 13**

**Code:**

#include<stdio.h>

#include<stdlib.h>

#include<math.h>

main()

{

int n,i,j,k;

float A1[100][100],coeff[100],A2[100][100],A3[100][100],A4[100][100],A[100][100],I[100][100];

printf("Enter the order of the Square Matrix A : ");

scanf("%d",&n);

printf("Enter the elements of the Square Matrix A : ");

for(i=0;i<n;i++)

{

for(j=0;j<n;j++)

{

scanf("%f",&A1[i][j]);

}

}

printf("\nThe Square Matrix A is given by : \n");

for(i=0;i<n;i++)

{

for(j=0;j<n;j++)

{

printf("%0.0f\t",A1[i][j]);

}

printf("\n");

}

printf("\nEnter the coefficients of the Charecteristc Polynomial of the square matrix A : ");

for(i=0;i<=n;i++)

{

printf("\nEnter the coefficient of %d power : ",i);

scanf("%f",&coeff[i]);

}

for(i=0;i<=n;i++)

{

for(j=0;j<n;j++)

{

A2[i][j]=0.0;

for(k=0;k<n;k++)

{

A2[i][j]+=A1[i][k]\*A1[k][j];

}

}

}

for(i=0;i<=n;i++)

{

for(j=0;j<n;j++)

{

A3[i][j]=0.0;

for(k=0;k<n;k++)

{

A3[i][j]+=A2[i][k]\*A1[k][j];

}

}

}

for(i=0;i<=n;i++)

{

for(j=0;j<n;j++)

{

A4[i][j]=0.0;

for(k=0;k<n;k++)

{

A4[i][j]+=A2[i][k]\*A2[k][j];

}

}

}

for(i=0;i<=n;i++)

{

for(j=0;j<n;j++)

{

if(i==j)

{

I[i][j]=1.0;

}

else

{

I[i][j]=0.0;

}

}

}

for(i=0;i<=n;i++)

{

for(j=0;j<n;j++)

{

A[i][j]=coeff[4]\*A4[i][j]+coeff[3]\*A3[i][j]+coeff[2]\*A2[i][j]+coeff[1]\*A1[i][j]+coeff[0]\*I[i][j];

}

}

printf("\nThe charecteristic equation of this matrix is as follows : ");

printf("A^4-8A^3+21A^2-20A+5I = 0\n");

printf("\nThe resultant Matrix is given by : \n");

for(i=1;i<=n;i++)

{

for(j=1;j<=n;j++)

{

printf("%0.0f\t",A[i][j]);

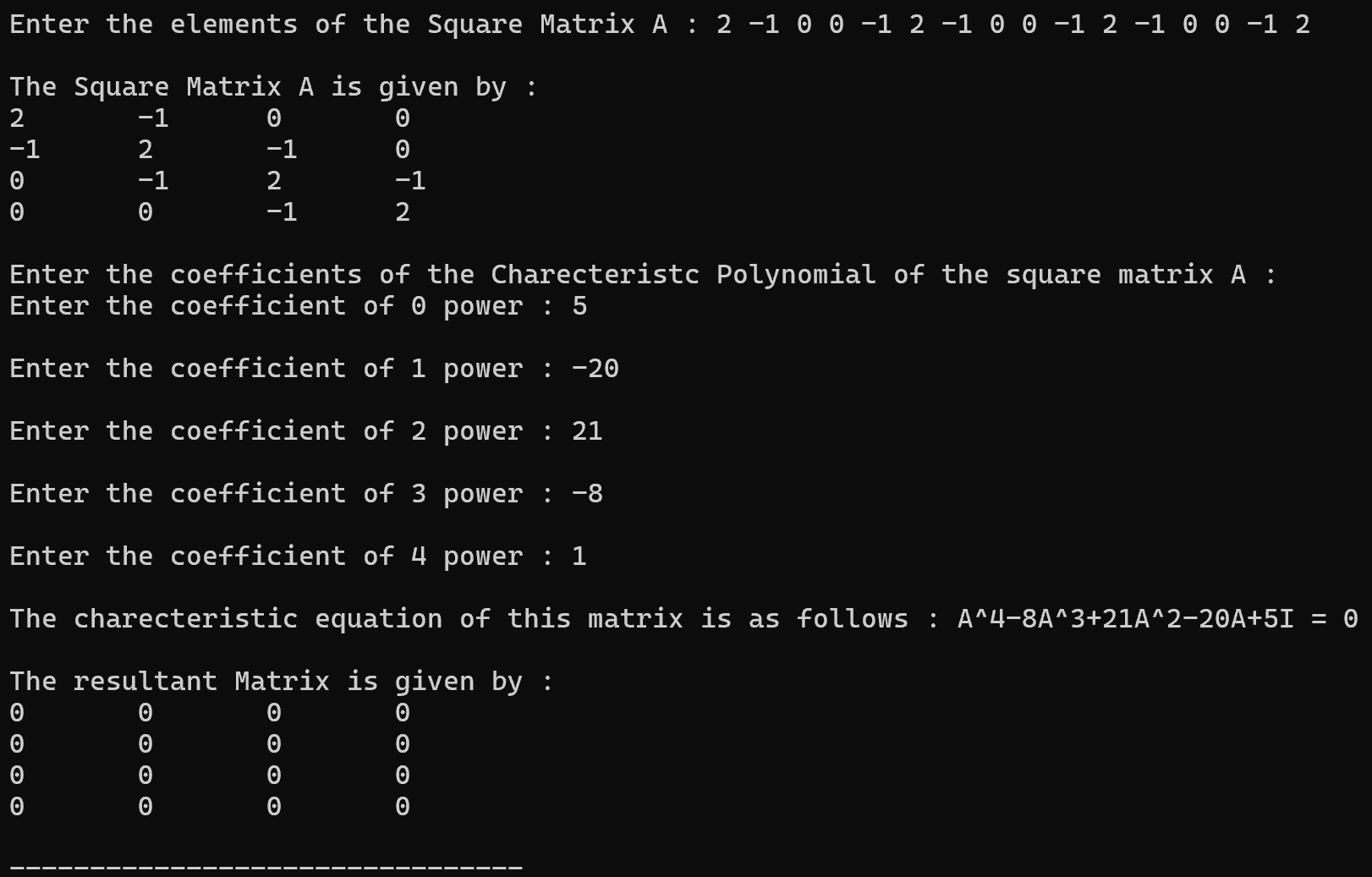
}

printf("\n");

}

}

**Output :**

****