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Smt. Chandaben Mohanbhai Patel Institute of Computer Applications (CMPICA)

Faculty of Computer Science and Applications

Case Study

B.Sc. IT – Semester II

CA409: Computer Oriented Numerical Methods

Title of Case Study

Write C Program to solve system of linear equations Using Gauss Elimination Method

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Code of the C program:

```
/*This program is to solve the linear equations using gauss Jordan method*/


#include <stdio.h>


void gauss(void);


int main()
{
   gauss();
   return 0;
}


void gauss(void)
{
   int n, i, j, m;
   float a[25][25], b, c[20], sum;


   printf("Enter order of matrix(Enter number of rows in matrix): ");
   scanf("%d", &n);


   printf("Enter arugument matrix row wise: ");
   for (i = 1; i <= n; i++)
   {
```

```
        for (j = 1; j <= n + 1; j++)
        {
            printf("\nA[%d][%d]: ", i, j);
            scanf("%f", &a[i][j]);
        }
    }

    /* Forward Elimination */
    for (j = 1; j <= n - 1; j++)  // pivot column
    {
        if (a[j][j] == 0.0f)
        {
            printf("Zero pivot encountered. (Pivoting not implemented)
\n");
            return;
        }

        for (i = j + 1; i <= n; i++)  // only rows below the pivot
        {
            b = a[i][j] / a[j][j];   // factor

            for (m = j; m <= n + 1; m++)
            {
                a[i][m] = a[i][m] - b * a[j][m];
            }
```

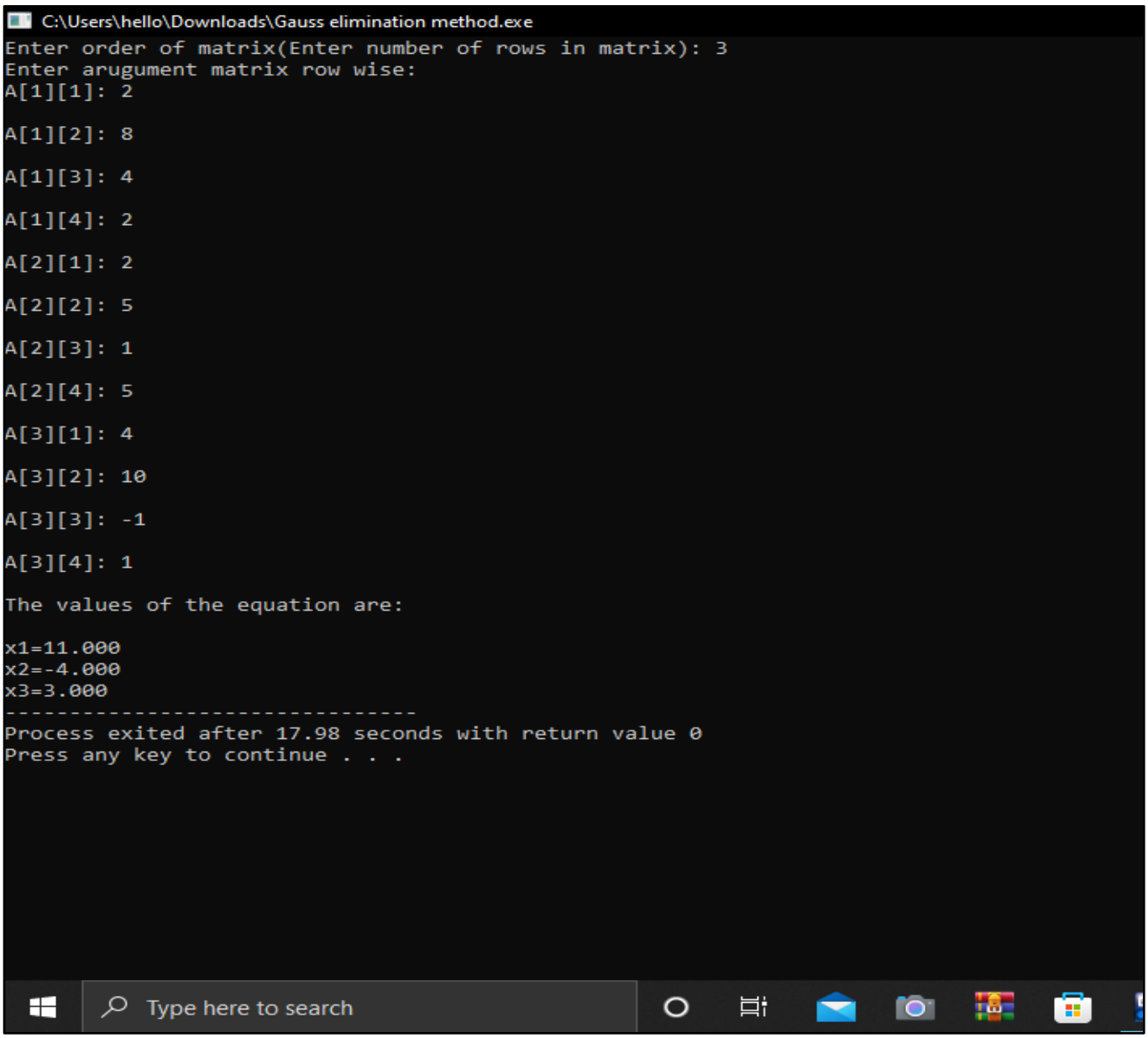
```
        }
    }

    /* Back Substitution */
    c[n] = a[n][n + 1] / a[n][n];

    for (i = n - 1; i >= 1; i--)
    {
        sum = 0.0f;
        for (j = i + 1; j <= n; j++)
        {
            sum = sum + (a[i][j] * c[j]);
        }
        c[i] = (a[i][n + 1] - sum) / a[i][i];
    }

    printf("\nThe values of the variables are:\n");
    for (i = 1; i <= n; i++)
    {
        printf("x%d = %.3f\n", i, c[i]);
    }
}
```

OUTPUT


C:\Users\hello\Downloads\Gauss elimination method.exe
Enter order of matrix(Enter number of rows in matrix): 3
Enter arugument matrix row wise:
A[1][1]: 2
A[1][2]: 8
A[1][3]: 4
A[1][4]: 2
A[2][1]: 2
A[2][2]: 5
A[2][3]: 1
A[2][4]: 5
A[3][1]: 4
A[3][2]: 10
A[3][3]: -1
A[3][4]: 1
The values of the equation are:
x1=11.000
x2=-4.000
x3=3.000
Process exited after 17.98 seconds with return value 0
Press any key to continue . . .
Type here to search