Output:

```
C:\csit\third sem Jonash\NM\
        ->Compiled by Jonash Chataut<-
        ->Cholesky_Decomposition
Enter the order of matrix (i.e. n x n): 3
Enter the elements of the matrix (row-wise):
1       4       7
4       80      44
7       44      89
Lower triangular matrix L (Cholesky factor):
  1.0000   0.0000   0.0000
  4.0000   8.0000   0.0000
  7.0000   2.0000   6.0000

--------------------------------
Process exited after 22.93 seconds with return value 0
Press any key to continue . . .
```

Output:

```
C:\csit\third sem Jonash\NM\
        ->Compiled by Jonash Chataut<-
        ->Gauss_elimination
Enter number of equations: 3
Enter the augmented matrix(i.e [A|B]):
1       -3      1       4
2       -8      8       -2
-6      3       -15     9

Solution:
x[1] = 3.000
x[2] = -1.000
x[3] = -2.000

--------------------------------
Process exited after 38.75 seconds with return value 0
Press any key to continue . . .
```

Output:

```
C:\csit\third sem Jonash\NM\

        ->Compiled by Jonash Chataut<-
        ->Gauss_Jordan
Enter the number of variables: 3
Enter the augmented matrix (i.e [A|B])
2       -1      4       15
2       3       -2      1
3       2       -4      -4

Initial Augmented Matrix:
  2.0000  -1.0000   4.0000  15.0000
  2.0000   3.0000  -2.0000   1.0000
  3.0000   2.0000  -4.0000  -4.0000

Step 1:
  1.0000  -0.5000   2.0000   7.5000
  0.0000   4.0000  -6.0000 -14.0000
  0.0000   3.5000 -10.0000 -26.5000

Step 2:
  1.0000   0.0000   1.2500   5.7500
  0.0000   1.0000  -1.5000  -3.5000
  0.0000   0.0000  -4.7500 -14.2500

Step 3:
  1.0000   0.0000   0.0000   2.0000
  0.0000   1.0000   0.0000   1.0000
 -0.0000  -0.0000   1.0000   3.0000

The solution is:
x1 = 2.0000
x2 = 1.0000
x3 = 3.0000

--------------------------------
Process exited after 28.93 seconds with return value 0
Press any key to continue . . .
```

Output: Gauss Partial Pivoting

```
C:\csit\third sem Jonash\NM\
        ->Compiled by Jonash Chataut<-
Enter the number of equations: 3
Enter the coefficients of the matrix A (3x3):
2       1       1
4       -6      0
-2      7       2
Enter the constants vector b (3 values):
5
-2
9

Solution Vector x:
x[0] = 1.0000
x[1] = 1.0000
x[2] = 2.0000

--------------------------------
Process exited after 24.94 seconds with return value 0
Press any key to continue . . .
```

Output:

```
C:\csit\third sem Jonash\NM\
        ->Compiled by Jonash Chataut<-
        ->Jacobi Iteration
Enter the number of equations: 3
Enter the augmented matrix [A|B]
5       -2      3       -1
-3      9       1       2
2       -1      -7      3
Enter initial guess values:
x[1]: 0
x[2]: 0
x[3]: 0

Iter    x[1]            x[2]            x[3]
1       -0.200000       0.222222        -0.428571
2       0.146032        0.203175        -0.517460
3       0.191746        0.328395        -0.415873
4       0.180882        0.332346        -0.420700
5       0.185359        0.329261        -0.424369
6       0.186326        0.331160        -0.422649
7       0.186054        0.331292        -0.422644

Solution:
x[1] = 0.186054
x[2] = 0.331292
x[3] = -0.422644

--------------------------------
Process exited after 52.59 seconds with return value 0
Press any key to continue . . .
```

Output:

```
C:\csit\third sem Jonash\NM\
        ->Compiled by Jonash Chataut<-
        ->Eulers method for function f(x,y)=2x+y

Input initial values of x and y:0       1

Input x at which y is required:0.4

Input step-size h:0.1

Value of y at x=0.400000 is 1.592300

--------------------------------
Process exited after 5.663 seconds with return value 0
Press any key to continue . . .
```

Output:

```
C:\csit\third sem Jonash\NM\
        ->Compiled by Jonash Chataut<-
        ->Heun's method [f(x,y) = x^2+y]

Input initial values of x and y: 0      1

Input x at which y is required: 0.2

Input step-size h: 0.05

Value of y at A = 0.200000 is 1.224184
--------------------------------
Process exited after 19.45 seconds with return value 0
Press any key to continue . . .
```

Output:

```
C:\csit\third sem Jonash\NM\
        ->Compiled by Jonash Chataut<-
        ->Taylor Series [f(x, y) = x + y]
Enter initial value of x (x0): 1
Enter initial value of y (y0): 1
Enter step size (h): 0.5
Enter number of steps: 4

Step-by-step values:
x                y
1.5000  2.375000
2.0000  4.921875
2.5000  9.373047
3.0000  16.918701

--------------------------------
Process exited after 8.149 seconds with return value 0
Press any key to continue . . .
```

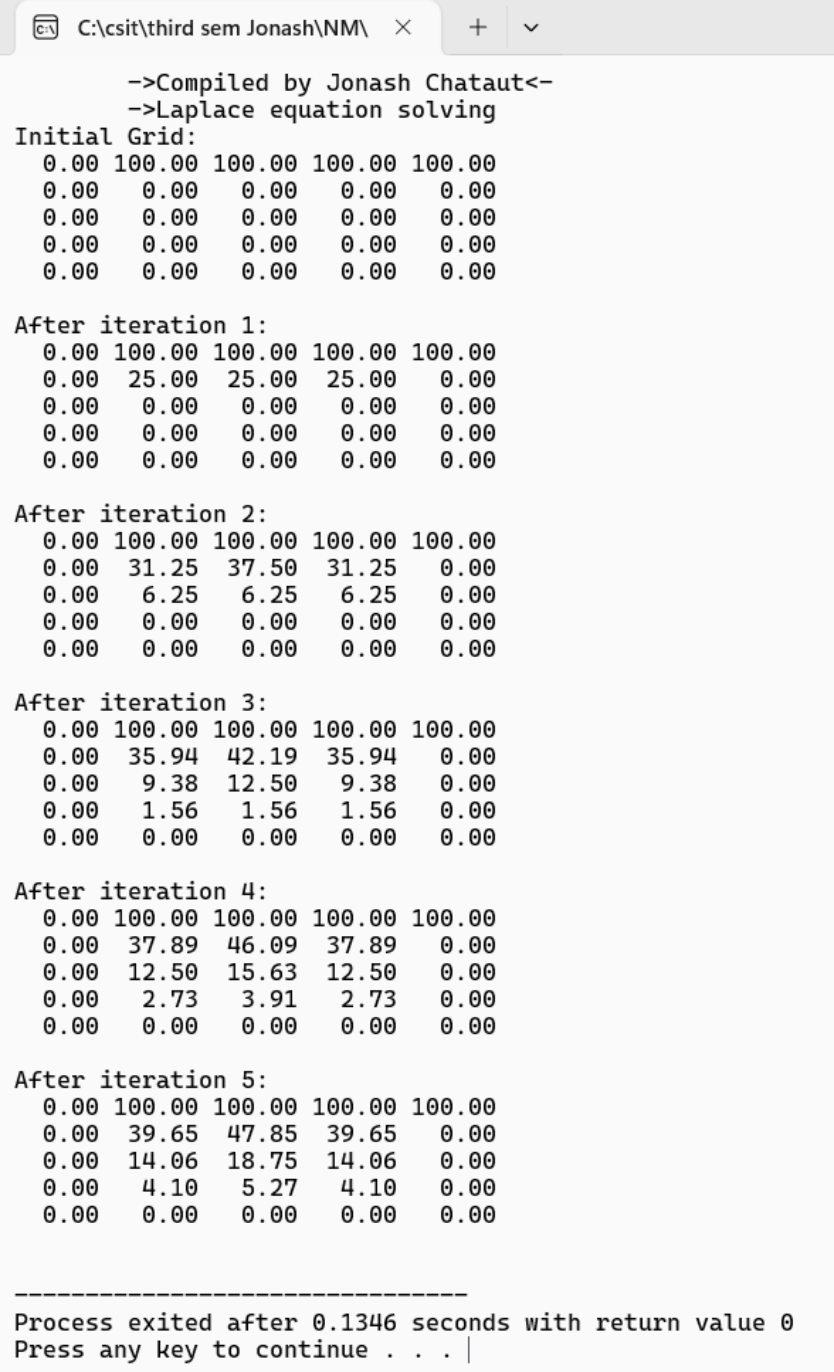
Output:

```
C:\csit\third sem Jonash\NM\

        ->Compiled by Jonash Chataut<-
        ->Runge Kutta Method [f(x,y) = x^2 + y^2]

Input initial values of x and y: 0      0

Input x at which y is required: 0.4

Input step-size h: 0.2

Value of y at x= 0.400000 is 0.021360

--------------------------------
Process exited after 19.36 seconds with return value 0
Press any key to continue . . .
```

Output:

```
C:\csit\third sem Jonash\NM\

        ->Compiled by Jonash Chataut<-
        ->Solving System of Differential equation

 Enter the initial point x: 0

 Enter the value of y_1(x): 1

 Enter the value of y_2(x): 1

 Enter the step length: 0.1


 Enter the point x at which y(x) is required: 0.5


Calculation of y_1(0.500000) and y_2(0.500000):

 x               y_1(x)                  y _2(x)
 0.000000       1.000000        1.000000
 0.100000       1.226000        1.222500
 0.200000       1.517211        1.509198
 0.300000       1.896075        1.900606
 0.400000       2.396132        2.469704
 0.500000       3.069613        3.359306

 Do you want to approximate at another point?(y/n): n

--------------------------------
Process exited after 34.7 seconds with return value 0
Press any key to continue . . .
```

Output:



Output: