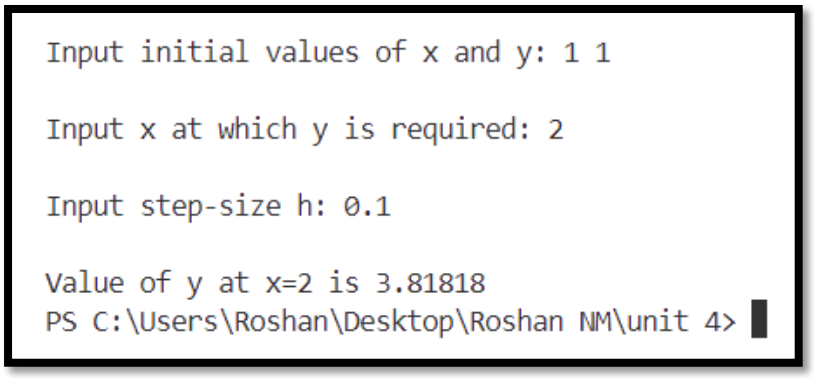
Input:

$\frac{dy}{dx} = \frac{2y}{x}$

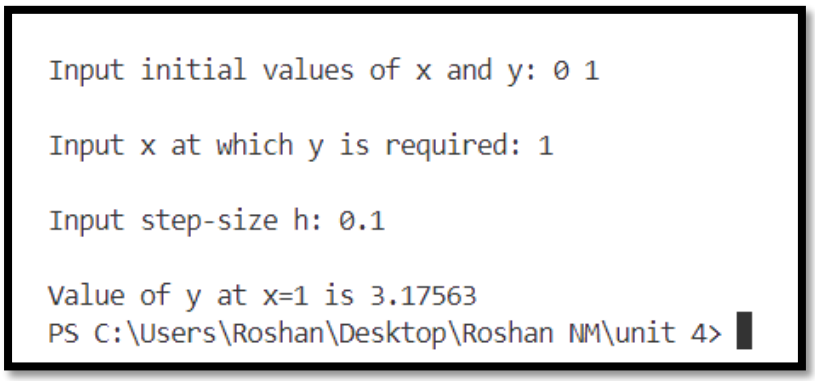
Output:



Input:

$\frac{dy}{dx} = 3x + \frac{y}{2}$

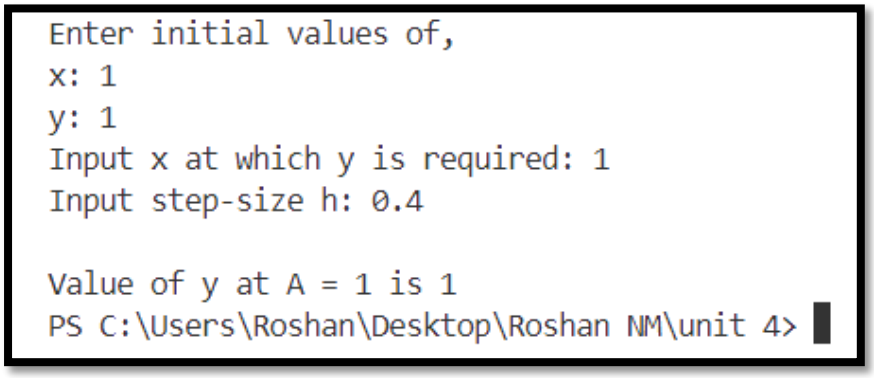
Output:



Input:

$\frac{dy}{dx} = \frac{2y}{x}$

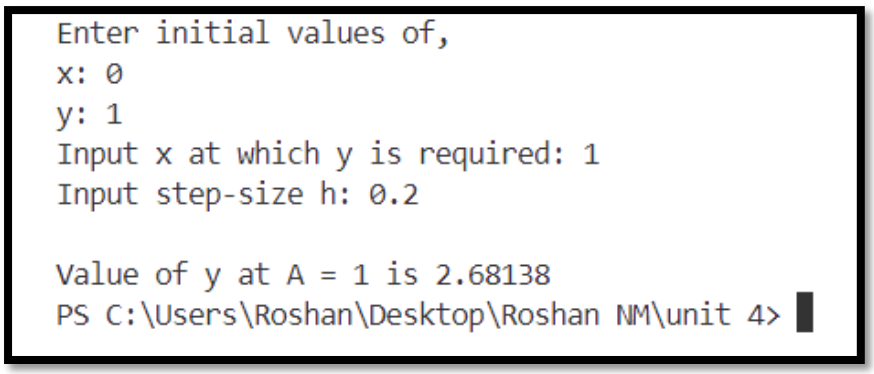
Output:



Input:

$\frac{dy}{dx}$ = 2xy

Output:



Input:

y′ = $ycos$

Output:

```
Input initial values of x and y: 0 1

Input x at which y is required: 0.5

Input step-size h: 0.25

1       0.25 1.28069
2       0.5 1.61513
Value of y at x = 0.5 is 1.61513
PS C:\Users\Roshan\Desktop\Roshan NM\unit 4>
```

Input:

$y' = x+y$

Output:

```
Input initial values of x and y: 0 1

Input x at which y is required: 0.5

Input step-size h: 0.25

1       0.25 1.31803
2       0.5 1.7974
Value of y at x = 0.5 is 1.7974
PS C:\Users\Roshan\Desktop\Roshan NM\unit 4>
```

Input:

$\frac{dy1}{dx}$ =x+$y1$+$y2$, $\frac{dy2}{dx}$ =1+$y1$+$y2$

Output:

```
Enter the initial point x: 0

Enter the value of y1(x): 1

Enter the value of y2(x): -1

Enter the step length(h): 0.1


Enter the point x at which y(x) is required: 0.2


Calculation of y1(0.2) and y2(0.2):

x               y1(x)           y2(x)
0               1               -1
0.1             1.01            -0.895
0.2             1.04315         -0.77685

Do you want to approximate at another point?(y/n): n
PS C:\Users\Roshan\Desktop\Roshan NM\unit 4>
```

Input:

$\frac{dy1}{dx}$ = $y1y2 + x^2$ +1, $\frac{dy2}{dx}$ =$y2$+ $xy1$ + $y1$

Output:

```
Enter the initial point x: 0

Enter the value of y1(x): 0

Enter the value of y2(x): 0

Enter the step length(h): 0.1


Enter the point x at which y(x) is required: 0.2


Calculation of y1(0.2) and y2(0.2):

x               y1(x)           y2(x)
0               0               0
0.1             0.105           0.0055
0.2             0.222208                0.025393

Do you want to approximate at another point?(y/n): n
PS C:\Users\Roshan\Desktop\Roshan NM\unit 4>
```

Input:

$\frac{d^2y}{dx^2}$ + 2 $\frac{dy}{dx}$ - 3y = 6x

Output:

```
Enter the initial point x: 0

Enter the value of y(x): 0

Enter the value of y'(x): 1

Enter the step length (h): 0.1


Enter the point x at which y(x) is required: 0.2

The approximate value of y(0.2) is 0.1722.

Do you want to approximate at another point? (y/n): n
PS C:\Users\Roshan\Desktop\Roshan NM\unit 4>
```

Input:

$\frac{d^2y}{dx^2}$ + 4 $\frac{dy}{dx}$ + 5y = 8x

Output:

```
Enter the initial point x: 0

Enter the value of y(x): 0

Enter the value of y'(x): 1

Enter the step length (h): 0.1


Enter the point x at which y(x) is required: 0.4

The approximate value of y(0.4) is 0.228393.

Do you want to approximate at another point? (y/n): n
PS C:\Users\Roshan\Desktop\Roshan NM\unit 4>
```

Input:

$\frac{d^2y}{dx^2} = 2x^2y + 1$

Output:

```
Enter the first boundary conditions x and y(x): 0 1

Enter the second boundary conditions x and y(x): 1 1

Enter the step length: 0.5

Enter the first guess of y'(0): 1.3


Enter the second guess of y'(0): 1.8


Enter the point x at which y(x) is required: 1

The approximate value of y(1) is 0.445312.
PS C:\Users\Roshan\Desktop\Roshan NM\unit 4>
```

Input:

$\frac{d^2y}{dx^2} = 4x^3y + 2$

Output:

```
Enter the first boundary conditions x and y(x): 0 1

Enter the second boundary conditions x and y(x): 1 1

Enter the step length: 0.5

Enter the first guess of y'(0): 1


Enter the second guess of y'(0): 0


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

The approximate value of y(0.5) is 0.25.
PS C:\Users\Roshan\Desktop\Roshan NM\unit 4>
```