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import numpy as np
import matplotlib.pyplot as plt

#Q1. RK4 for  $dy/dx = x + y$ ,  $y(0)=1$ 

def f(x,y):
    return x+y

h = 0.1
x = 0.0
y = 1.0
N = int(0.8 / h)

for i in range(N):
    k1 = f(x,y)
    k2 = f(x + 0.5*h, y + 0.5*h*k1)
    k3 = f(x + 0.5*h, y + 0.5*h*k2)
    k4 = f(x + h, y + h*k3)
    y = y + (h/6)*(k1 + 2*k2 + 2*k3 + k4)
    x = x + h

print("y(0.8) using 4th-order Runge-Kutta method =", y)

```

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y(0.8) using 4th-order Runge-Kutta method = 2.6510791265846305

```

