```
import numpy as np
import matplotlib.pyplot as plt

# RC Circuit parameters
R = 1000    # Resistance in ohms
C = 1e-6    # Capacitance in farads
V_source = 10  # DC voltage in volts

# Time setup
t0 = 0
t_final = 0.01  # 10 ms
h = 0.0001  # Step size
n_steps = int((t_final - t0) / h)

# Initial condition
Vc = 0  # Initial capacitor voltage
time = [t0]
vc_values = [Vc]

# Define the differential equation: dVc/dt = (V - Vc) / (RC)
def dVcdt(t, Vc):
    return (V_source - Vc) / (R * C)

# Modified Euler's Method
t = t0
for _ in range(n_steps):
```

```
    predictor = Vc + h * dVcdt(t, Vc)
    corrector = Vc + (h / 2) * (dVcdt(t, Vc) + dVcdt(t + h, predictor))
    Vc = corrector
    t += h
    time.append(t)
    vc_values.append(Vc)  # Ensure every step's value is appended

# Plotting the capacitor voltage over time
plt.plot(time, vc_values, label="Modified Euler Method")
plt.xlabel("Time (s)")
plt.ylabel("Capacitor Voltage Vc (V)")
plt.title("RC Circuit Response to DC Input (Modified Euler)")
plt.grid(True)
plt.legend()
plt.show()
```