

Code :-

```
1 mass = 68.1;
2 g = 9.8;
3 drag_coefficient = 0.25;
4 time_step = 0.1;
5 total_time = 12;
6
7 velocity = 0;
8 position = 0;
9
10 terminal_velocity = sqrt((mass * g) / drag_coefficient);
11
12 time_values = 0:time_step:total_time;
13 velocity_values = zeros(size(time_values));
14 position_values = zeros(size(time_values));
15
16 % Euler method
17 for i = 1:length(time_values)
18
19     drag_force = drag_coefficient * velocity^2;
20
21     acceleration = (mass * g - drag_force) / mass;
22
23     velocity = velocity + acceleration * time_step;
24     position = position + velocity * time_step;
25
26     velocity_values(i) = velocity;
27     position_values(i) = position;
28 end
29
30 figure;
31 subplot(2,1,1);
32 plot(time_values, velocity_values, 'b-', 'LineWidth', 1.5)
33 xlabel('Time (s)');
34 ylabel('Velocity (m/s)');
35 title('Velocity vs Time');
36
37 subplot(2,1,2);
38 plot(time_values, position_values, 'r-', 'LineWidth', 1.5);
39 xlabel('Time (s)');
40 ylabel('Position (m)');
41 title('Position vs Time');
42
43 disp(['Terminal Velocity: ' num2str(terminal_velocity) ' m/s']);
```

Result :-

```
>> LAB1
```

Terminal Velocity: 51.6674 m/s

