```
clear
n=100;                          % number of subintervals
dt = 0.5;                       % length (time) of each subinterval
v(1) = 100;                     % initial velocity
t(1) = 0;                       % initial time

for i = 2:n+1                  % n subintervals, n+1 points to calculate
   d =  0.001*v(i-1)^2;        % calculate the magnitude of the drag acceleration

   if (v(i - 1) <= 0)          % is ball falling or have 0 velocity?
      a = -10 + d;             % yes drag is upward
   else
      a = -10 - d;             % no, ball is rising, drag is downward
   endif

   v(i) = v(i - 1) + dt*a;     % velocity at start of subinterval i
   t(i) = t(i - 1) + dt;       % time at start of subinterval i
end
plot(t, v)
grid
```