

```
% diffusion on a grid
```

```
% creat a vector of numbers
```

```
N = 1000; % number of objects
```

```
X = zeros(N,1);
```

```
lambda = 0.1; % Probability of movement
```

```
M = 100; % number of time steps
```

```
c = [lambda, 2*lambda, 1];
```

```
xm(1) = 1;
```

```
xm(2) = -1;
```

```
xm(3) = 0;
```

```
for j = 1:M
```

```
    R = rand(N,1);
```

```
    for k = 1:N
```

```
        ndx= min(find(R(k)<=c));
```

```
        X(k) = X(k) + xm(ndx);
```

```
    end
```

```
    hist(X, [-20:20])
```

```
xlabel(' x(n)', 'FontSize', 18)
```

```
ylabel(' Counts', 'FontSize', 18)
```

```
    pause(0.1)
```

```
end
```

```
name=sprintf('Locations of %d Particles after %d steps', N, M)
```

```
title(name, 'FontSize', 18)
```