

Project 2

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Below is the Matlab code used to generate the plots. Each plot has relevant values in the title.

```
%You will assume 1 trade (1 cluster) on each time step,  
%and you will use 10,000,000 time steps  
time_step = 10.0e6;  
  
%Need to generate a random number, p, between 0 and 1  
p = rand(time_step,1);  
t = 2.857;  
s = (p).^(-1/t); %s is the size of the trader-cluster  
  
r = rand(time_step,1);  
r2 = rand();  
phi = r<r2; % This generates a random binary array  
phi = 2*phi - 1; %This simple procedure produces a matrix with +1, and -1  
  
delta_P = s.*phi;%multiplies two vectros element by element  
mu = mean(delta_P);  
sigma = std(delta_P);  
  
x = (-200:.1:200);  
new = histc(delta_P,x);  
new1 = log10(new);  
  
HG = (time_step)*exp(-(1/2)*((x-mu)/(sigma)).^2)/(sigma*sqrt(2*pi));  
HG2 = log10(transpose(HG));  
new2 = HG2>0;  
HG2 = HG2.*new2;  
  
figure(2)  
plot(x,HG2,x,new1)  
title(['Histogram of 10e6 price changes,', '\mu =', num2str(mu), '\sigma =', num2str(sigma), '\tau =', num2str(t)])  
ylabel('Log_{10} H(\Delta P)')  
xlabel('\Delta P')  
legend('H(\Delta P`)', 'H(\Delta P)');  
%set(gca, 'Yscale', 'log')
```







