```
clear all

t0  = 0;     %initial time
t1  = 100;    % final time
x0  = 10;     % initial cell population
y0  = 10;    % initial glucose concentration
z0  = 10;     % initial ammonium concentration
%
% initial state for use in DE solver.
%
S0  = [x0;y0;z0];

%
% rate constants and problem parameters
%

ep  = 25;
u   = 46;
q   = 0.03;
v   = 0.65;

% not sure which values to use for these parameters
yInf = 15.33;
zInf = 0.0034;
xInf = 1.227;
K   = 30;
L   = 2;
r   = q*(yInf+K)*(zInf+L)/(yInf*zInf);
F   = (q*zInf-q*v)/(xInf*q);
%
% rate constants into parameter vector
%
params(1) = q;
params(2) = u;
params(3) = r;
params(4) = K;
params(5) = ep;
params(6) = L;
params(7) = F;
params(8) = v;
%
% define function for fixed parameter values
%
AA_chemostat_2nutrient_dynamics = @(t,S)AA_chemostat_2nutrient_dynamics(t,S,params);

%
% call the matlab function to solve the DE for us.
%
[t,St] = ode45(AA_chemostat_2nutrient_dynamics,[t0 t1],S0);
%
% Plot the results.
%
plot(t,St,'LineWidth',3)
```

```
legend('cells','glucose','ammonium')
xlabel('time (hrs)')
ylabel('states(g)')
```