```
N = 10;
S = 1000; % kg/h
W = 2000; % kg/h
Xin = 0.05;
Yin = 0;
K = 10;

A = zeros(N);
B = zeros([N,1]);

% Fisrt stage
A(1, 1) = -(1+K*S/W);
A(1, 2) = K*S/W;
B(1, 1) = -Xin;
A_entering = Xin * W;

% Middle Stages
for i=2:N-1
    A(i, i-1) = 1;
    A(i, i) = -(1+K*S/W);
    A(i, i+1) = K*S/W;
end

% Last stage
A(N, N-1) = 1;
A(N, N) = -(1+K*S/W);
B(N, 1) = -(S/W)*Yin;

x = A\B;
y = K.*x;
A_recovered = y(1) * S;

fprintf('Percent of A recovered = %3.10f', A_recovered / A_entering * 100)

Percent of A recovered = 99.9999918080
```

```
% all have units of 1/s
kab = 0.1;
kba = 0.02;
kbc = 0.5;
kcb = 0.1;
kcd = 0.01;
kdc = 0.1;
kda = 0.05;
kad = 0.2;
kbd = 0.3;
kdb = 0.1;

A = [-kab-kad, kba, 0, kda;...
     kab, -kba-kbc-kbd, kcb, kdb;...
     0, kbc, -kcb-kcd, kdc;...
     kad, kbd, kcd, -kda-kdc-kdb;...
     1, 1, 1, 1];

B = [0; 0; 0; 0; 1];


x = A\B;

fprintf('Species Concentrations (gmol/Liter) \n')
fprintf('A: %f \n', x(1))
fprintf('B: %f \n', x(2))
fprintf('C: %f \n', x(3))
fprintf('D: %f \n', x(4))
```

```
Species Concentrations (gmol/Liter)
A: 0.038559
B: 0.108696
C: 0.664868
D: 0.187877
```