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a = 0.4

n = 0.01

g = 0.02

b = 0.07

s = 0.27

k_0 = 200

L_0 = 100

E_0 = 1

function Y =get_Y(K,L,a)

Y = 10*(K)^a*(E*L)^(1-a)

endfunction

function k_optimum = get_k_opt(n,g,b,s,a)

k_optimum = ((10*s)/(n+g+b))^(1/(1-a))

endfunction

function y =get_y(k_optimum,a)

y = 10*(k_optimum)^a

endfunction

k_optimum = get_k_opt(n,g,b,s,a) #k_opt=243

y_optimum =get_y(k_optimum,a) #y_opt = 90

#kE = K/LE

#yE = Y/LE

#del_k is k(t+1)-k(t)

vector_del_k = []

vector_kE = [k_0]

vector_yE = [get_y(k_0,a)]

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vector_k = [k_0*E_0]

vector_y = [get_y(k_0,a)*E_0]

vector_K = [k_0*E_0*L_0]

vector_Y = [get_y(k_0,a)*E_0*L_0]

vector_E = [E_0]

vector_L = [L_0]

for i=1:50

vector_del_k = [vector_del_k, s*get_y(vector_kE(i),a)-(n+g+b)*vector_kE(i)] # change k

vector_kE = [vector_kE, vector_kE(i) + vector_del_k(i)] # k=K/LE

vector_yE = [vector_yE, get_y(vector_kE(i+1),a)] # y=Y/LE

vector_E = [vector_E, (1+g)*vector_E(i)] # E=E*(1+g)

vector_L = [vector_L, (1+n)*vector_L(i)] # L=L*(1+n)

vector_k = [vector_k, vector_kE(i+1)*vector_E(i+1)] # k*E =K/L

vector_y = [vector_y, vector_yE(i+1)*vector_E(i+1)] # y*E =Y/L

vector_K = [vector_K, vector_k(i+1)*vector_L(i+1)] # K

vector_Y = [vector_Y, vector_y(i+1)*vector_L(i+1)] # Y

end

#Rate of increase

temp_kE = []

temp_yE = []

temp_k = []

temp_y = []

temp_K = []

temp_Y = []

```
for i=1:20
temp_kE = [temp_kE, (vector_kE(i+1)/vector_kE(i))-1 ]
temp_yE = [temp_yE, (vector_yE(i+1)/vector_yE(i))-1 ]
temp_k = [temp_k, (vector_k(i+1)/vector_k(i))-1]
temp_y = [temp_y, (vector_y(i+1)/vector_y(i))-1]
temp_K = [temp_K, (vector_K(i+1)/vector_K(i))-1]
temp_Y = [temp_Y, (vector_Y(i+1)/vector_Y(i))-1]
end
```

```
function print_x(x,value)
plot(x);
title(value);
xlabel('period');
ylabel('Rate of increase');
end
print_x(temp_kE,'Rate of increase k; k=K/LE')
print_x(temp_yE,'Rate of increase y; y=Y/LE')
print_x(temp_k,'Rate of increase k*E; k*E=K/L')
print_x(temp_y,'Rate of increase y*E; y*E=Y/L')
print_x(temp_K,'Rate of increase K; K=k*L*E')
print_x(temp_Y,'Rate of increase Y; Y=y*L*E')
```