/srch1.txt
program to solve simplest continuous time search problem */

closeall:
output file = search.out reset;

/* parameters are defined as follows:
 rho      discount rate
   c        cost of search
   lam      rate of arrival of offers
      alpha parameter which describes wage offer distribution (F)
 */

/* assume that wage offer distribution is exponential in this case, 
  with parameter defined by alpha */
fn cdf_f(x,alpha) = 1 - exp( - alpha * x );
fn pdf_f(x,alpha) = alpha * exp(-alpha * x);

galpha = 0;
gwold = 0;

proc i_rhs(x);
  retp( (x - gwold) .* pdf_f(x,galpha) );
endp;

proc rhs(wold,rho,c,lam,alpha);
local ulim;
  ulim = -ln(.005) / alpha;
  galpha = alpha;
 gwold = wold;
  retp( c + lam / rho * intquad1(&i_rhs,(ulim | wold)) );
endp;

proc 1=wstar(rho,c,lam,alpha);
local crit_val,i,wold,wnew,shrink  ;
  wold = 1/alpha;
  shrink = .4;
  crit_val = 1;
do until crit_val lt .000001;
    wnew = shrink * rhs(wold,rho,c,lam,alpha)
      + (1-shrink) * wold;
    crit_val = abs( wnew - wold );
  wold = wnew;
do;

print "************* RW computation ************** ";
print "rho = " rho;
print "c = " c;
print "lam = " lam;
print "alpha = " alpha;
print "RESERVATION WAGE" wnew;
print "VALUE OF SEARCH " wnew/rho;
print "unemployment exit rate" ( lam * cdf_f(wnew,alpha) );
retp( wnew );
endp;

/* some trial values */
wstar1 = wstar(.03,-5,.3,.1);
wstar2 = wstar(.05,-10,.3,.2);
end;
rho = 0.030000000
\c = -5.0000000
\lambda = 0.3000000
\alpha = 0.1000000
RESERVATION WAGE 14.972948
VALUE OF SEARCH 499.09826
unemployment exit rate 0.23287962

rho = 0.050000000
\c = -10.000000
\lambda = 0.3000000
\alpha = 0.2000000
RESERVATION WAGE 3.6427582
VALUE OF SEARCH 72.855164
unemployment exit rate 0.15521776