

```

proc iml;
n=4;
corr = {1 .7 .5 .1,
        .7 1 .4 -.1,
        .5 .4 1 .6,
        .1 -.1 .6 1};

std = repeat(.1,n);
cov = diag(std)*corr*diag(std);

sim = J(1,n,0); ;

w0 = repeat(1/n,n);

start F_ES(x) global(sim);
  v = sim*x`;
  call sort(v);
  cutoff = floor(nrow(sim)*.05);
  es = v[1:cutoff][:];
  return (-es);
finish F_ES;

lb = repeat(0,1,n);
ub = repeat(1,1,n);
ones = repeat(1,1,n);
addc = ones || {0 1};

con = (lb || {. .}) //
      (ub || {. .}) //
      addc;
optn = {0 0};
x = w0`;

wghts = J(100,n,0);
objs = J(100,1);

do i=1 to 100;
  sim = RANDNORMAL( 10000, repeat(0,n), cov ) ;
  call nlpqn(rc,w,"F_ES",x,optn,con);
  wghts[i,] = w;
  objs[i] = f_es(w);
end;

obj = mean(objs);
wgt = mean(wghts);
print obj;
print wgt;
quit;

```