```
p=0.95;
format long
prompt = 'How many pairs in sample? ';
N = input(prompt);

prompt ='Area of left tail in confidence interval? (e.g. 0.975)';
gamma= input(prompt);
Degf=N-1;
disp(' Wait. This could take seconds to minutes.')
gammaest=0;
Kest=0;
Kstep=4;
DirectK=+1;

while abs(gammaest-gamma)> 1E-8
Kest=Kest+Kstep;
K=Kest;
stepper=0.05/N;
toprange=8/(N^0.5)+stepper;
xdist=[0:stepper:toprange];
boxes=length(xdist);
boxes=round(boxes/2+.1)*2-1;
Prchi =zeros(1,boxes);
Combpdf= zeros(1,boxes);

halfgauss=exp(-(N/2)*xdist.^2);
shrinkfactor=2*(N/(2*pi))^.5;

for s=1:boxes
xtest=xdist(s);
startp =(0.5+p/2);
resti= norminv(startp,0,1)+xtest-.1;
restiprior=resti;
phigh=normcdf(xtest+resti);
plow=normcdf(xtest-resti);
pesti=phigh-plow;
pestiprior=pesti;

 perror=pesti-p;
resti= resti+.11;
phigh=normcdf(xtest+resti);
plow=normcdf(xtest-resti);
pesti=phigh-plow;
perror=pesti-p;

deltap=pesti-pestiprior;
deltaresti= resti- restiprior;
newresti=resti-perror/deltap* deltaresti;
restiprior= resti;
resti= newresti;
pestiprior=pesti;
phigh=normcdf(xtest+resti);
plow=normcdf(xtest-resti);
pesti=phigh-plow;
perror=pesti-p;


while abs( perror)>2e-15;
```

```
deltap=pesti-pestiprior;
deltaresti= resti- restiprior;
newresti=resti-perror/deltap* deltaresti;
restiprior= resti;
resti= newresti;
pestiprior=pesti;
phigh=normcdf(xtest+resti);
plow=normcdf(xtest-resti);
pesti=phigh-plow;
perror=pesti-p;
end

chiprob=1-chi2cdf((Degf*resti^2)/(K^2),Degf);
Prchi(s) =chiprob;
Combpdf(s)=chiprob*halfgauss(s);
end
Integ=0;
for s=1:2:boxes-2

M= Combpdf(s+1)*stepper*2;
T=( Combpdf(s)+Combpdf(s+2))*stepper;
Integ=Integ+(M*2+T)/3* shrinkfactor;
end
gammaest=Integ;
if gammaest*DirectK>gamma*DirectK
    DirectK=DirectK*-1;
    Kstep=-Kstep/2;
end
end

disp(' Z is 1.96.')
disp(' sample size is '),  disp(N)
disp(' gamma is '),  disp(gamma)
disp(' Coefficient for BA confidence interval for LOAs considered as a pair
is ')
disp(Kest)
```