Problem 3

Q1. The matlab codes can be found in the appendix

E[y1]=1.02

E[y2]=1.06

Q2. we have

1. Expected utility of investing into project 1 is 0.0197
2. Expected utility of investing into project 1 is 0.0114

Q3. Foris the household indifferent between investing into two projects when y2=1.06.

1

But when y2=1.1, for is the household indifferent between investing into two projects.

2

Appendix

% problem3

clc

close all

addpath(genpath('CEdemos'));

addpath(genpath('CEtools'));

n=11; % number of nodes

sig=0.25; % s.d.

gam=1.5; % risk aversion

y1=1.02;

y2=1.06;

y2=1.1

epsi=1.0e-6;

% approximate log-normally distributed random variable

sig2=sig^2;

mu=-sig2/2;

[x,w]=qnwnorm(n,mu,sig2);

elnx=w'\*x;

x=exp(x);

% test

ex=w'\*x;

dist=ex-1.0;

if (abs(dist)>epsi)

disp('increase number of nodes');

return;

end;

% form stochastic (gross) return

R=y2\*x;

% expected return of two projects

ey1=y1

ey2=ex\*y2

% specify functions:

utilfun=@(gam,c) f\_util(gam,c);

distfun=@(gam) f\_dist(utilfun,gam,y1,R,w);

% TEST

% utility for risk-free investment

util\_rf=feval(utilfun,gam,y1);

% utility for risky investment

util\_r=feval(utilfun,gam,y2);

util\_r=w'\*util\_r;

% test: plot distance function

gamvec=[0.1:0.1:4]';

ng=length(gamvec);

dist=zeros(ng,1);

for gc=1:ng,

dist(gc)=feval(distfun,gamvec(gc));

end;

plot(gamvec,dist);

xlabel('gamma')

ylabel('Difference between two utilities')

title('Distance Function when y2=1.06')

% evaluate distance at baseline parameter

dist=feval(distfun,gam);

if (abs(dist)>epsi),

gam=fzero(distfun,gam);

disp(['solution for gamma is: ', num2str(gam)]);

else

disp('no numerical solution is required');

end;

function util=f\_util(gam,c)

epsi=1.0e-04;

if (abs(gam-1.0)<epsi),

util=log(c);

else

temp=1.0-gam;

util=1.0./temp\*(c.^temp-1.0);

end

end

function dist=f\_dist(utilfun,gam,y1,R,w)

f1=feval(utilfun,gam,y1);

f2=feval(utilfun,gam,R);

f2=w'\*f2;

dist=f1-f2;

end