LAGRANGE INTERPOLATION FORMULA

PROGRAM 1

c l.for

real,dimension(5)::x,y

open(unit=1,file="l.in")

read(1,\*)n,a

open(unit=2,file="l.out")

write(2,\*)"n=",n

write(2,\*)"a=",a

do 5 i=1,n

read(1,\*) x(i),y(i)

5 continue

sum=0

do 2 i=1,n

product=1.0

do 3 j=1,n

if(i.ne.j)then

product=product\*(a-x(j))/(x(i)-x(j))

end if

3 continue

sum=sum+(product\*y(i))

2 continue

write(2,\*)"y(a)=",sum

stop

end

INPUT FILE

5

55000

0 9.81

20000 9.7487

40000 9.6879

60000 9.6278

80000 9.5682

OUTPUT FILE

n= 5

a= 55000.0000

y(a)= 9.64276314

PROGRAM 2

c l1.for

real,dimension(5)::x,y

open(unit=1,file="l1.in")

read(1,\*)n,a

open(unit=2,file="l1.out")

write(2,\*)"n=",n

write(2,\*)"a=",a

do 5 i=1,n

read(1,\*) x(i),y(i)

5 continue

sum=0

do 2 i=1,n

product=1.0

do 3 j=1,n

if(i.ne.j)then

product=product\*(a-x(j))/(x(i)-x(j))

end if

3 continue

sum=sum+(product\*y(i))

2 continue

write(2,\*)"y(a)=",sum

stop

end

INPUT FILE

5

372.1

361 154.9

367 167.0

378 191.0

387 212.5

399 244.2

OUTPUT FILE

n= 5

a= 372.100006

y(a)= 177.830414