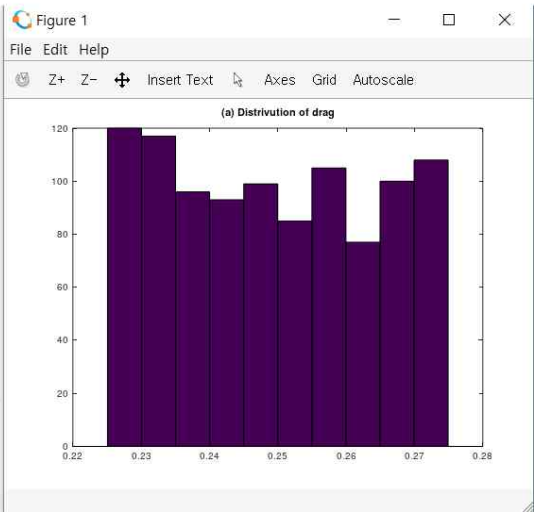
예제 14.2

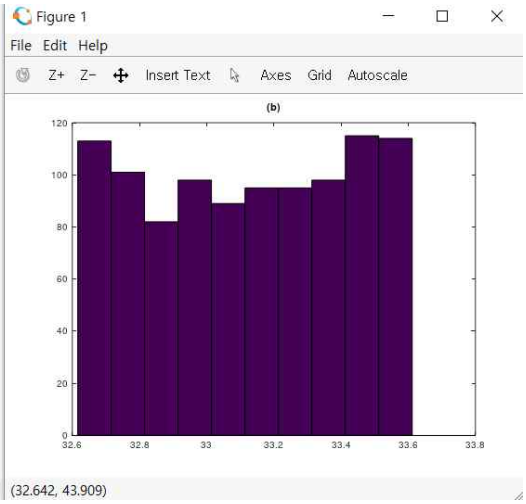
```
   0.88605447
   0.67759443
   0.66659123
   0.27645338
   0.18077915
   0.26597976
   0.12981203
   0.13801886
   0.89873526
   0.78896184
   0.65329706
   0.72580783
   0.41055042

>> r=rand(n,1);
>> cdrand=cdmin+(cdmax-cdmin)*r;
>> meancd=mean(cdrand),stdcd=std(cdrand)
meancd =  0.24925
stdcd =  0.014844
>> subplot(2,1,1)
>> Deltacd=(max(cdrand)-min(cdrand))/meancd/2*100.
Deltacd =  10.003
>> subplot(2,1,1)
>> hist(cdrand),title('(a) Distrivution of drag')
>>
```



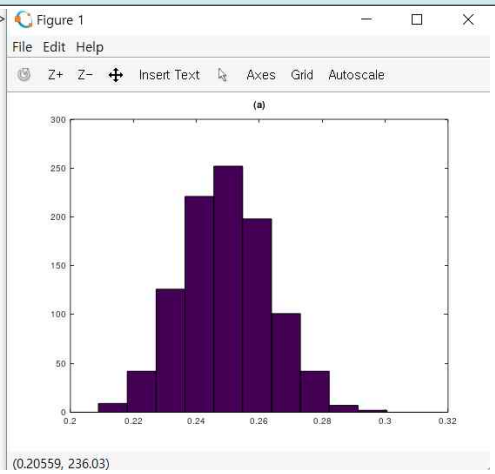

```
   0.65329706
   0.72580783
   0.41055042

>> r=rand(n,1);
>> cdrand=cdmin+(cdmax-cdmin)*r;
>> meancd=mean(cdrand),stdcd=std(cdrand)
meancd =  0.24925
stdcd =  0.014844
>> subplot(2,1,1)
>> Deltacd=(max(cdrand)-min(cdrand))/meancd/2*100.
Deltacd =  10.003
>> subplot(2,1,1)
>> hist(cdrand),title('(a) Distrivution of drag')
>> xlabel('cd(kg/m)')
>> xlabel('cd(kg/m)')
>> xlabel('cd (kg/m)')
>> vrand=sqrt(g*m./cdrand).*tanh(sqrt(g*cdrand/m)*t);
>> meanv = mean(vrand)
meanv =  33.123
>> Deltav = (max(vrand)-min(vrand))/meanv/2*100.
Deltav =  1.5031
>> subplot(2,1,2)
>> hist(vrand),title('(b)')
>>
```

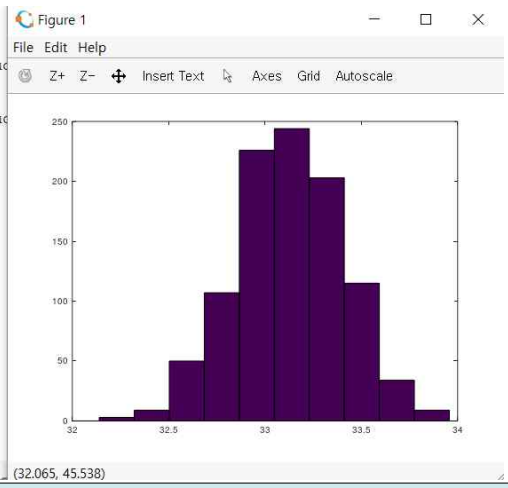


예제 14.3

```
error: can't perform indexing operations for <unknown type>
>> clear
>> n = 1000
n =  1000
>> t=4; m=68.1;g=9.81;
>> cd=0.25;
>> stdev=0.01443;
>> r=randn(n,1);
>> cdrand=cd+stdev*r;
>> meancd=mean(cdrand),stdevcd=std(cdrand)
meancd =  0.24958
stdevcd =  0.013943
>> cvcd=stdevcd/meancd*100.
cvcd =  5.5866
>> subplot(2,1,1)
>> hist(cdrand),title('(a)')
>>
```




```
>> xlabel('cd (kg/m)')
>> vrand=sqrt(g*m./cdrand).*tanh(sqrt(g*cdrand/m)*t);
>> meanv=mean(vrand).stdevv=std(vrand)
error: invalid dot name structure assignment because the struc
pt on the structure array to resolve.
>> meanv=mean(vrand).stdev=std(vrand)
error: invalid dot name structure assignment because the struc
pt on the structure array to resolve.
>> meanv=mean(vrand),stdevv=std(vrand)
meanv =  33.123
stdevv =  0.27793
>> cvv=stdevv/meanv*100.
cvv =  0.83908
>> subplot(2,1,2)
>> his(vrand),titile(
'(b)')
error: 'his' undefined near line 1 column 1
>> his(vrand),titile('(b)')
error: 'his' undefined near line 1 column 1
>> hist(vrand),titile('(b)')
error: 'titile' undefined near line 1 column 13
>>
```



예제 14.4

예제 14.4

$$\bar{x} = \frac{360}{8} = 45 \qquad \bar{y} = \frac{5.135}{8} = 641.875$$

계산기, 절편 ⇒

$$a_1 = \frac{8(312,850) - 360(5,135)}{8(20,400) - (360)^2} = 19.47024$$

$$a_0 = 641.875 - 19.47024(45) = -234.2857$$

$$F = -234.2857 + 19.47024v$$

예제 14.5

예제 14.5

$$S_y = \sqrt{\frac{1,808,297}{8-1}} = 508.26$$

$$S_{y/x} = \sqrt{\frac{216,118}{8-2}} = 189.79$$

$$r^2 = \frac{1,808,297 - 216,118}{1,808,297} = 0.8805$$

또는

$$r = \sqrt{0.8805} = 0.9383$$

⇒ 선형모델이 88.05%의 확실성

예제 14.6

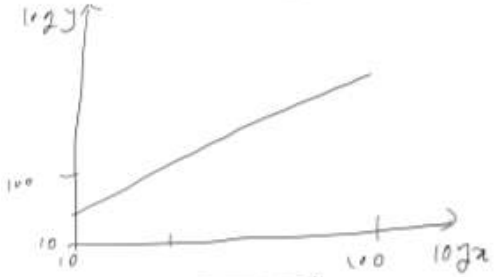
예제 14.6

$$\hat{x} = \frac{12.606}{8} = 1.5757 \qquad \hat{y} = \frac{20.515}{8} = 2.5644$$

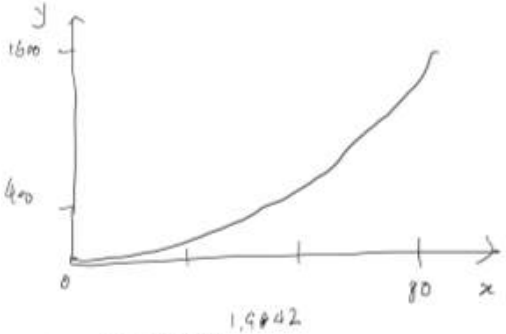
$$a_1 = 1.9842, \quad a_0 = -0.5620$$

$$\log y = -0.5620 + 1.9842 \log x$$

변환된 데이터의 점합



데이터의 멱함수식 점합



1.9842

$F = 0.2741 V$

⇒ 최소제곱점합

case study

```
>> S=[1.3 1.8 3 4.5 6 8 9];
>> v = [0.07 0.13 0.22 0.275 0.335 0.35 0.36];
>> [a,r2] = linregr(1./S, 1./v)
a =

   16.40224    0.19022

r2 =  0.93441
>> vm=1/a(2)
vm =  5.2570
>> ks = vm*a(1)
ks =  86.226
>>
>> [a,r2]=linregr(1./S.^2,1./v)
a =

   19.3760    2.4492

r2 =  0.99293
>> vm=1/a(2)
vm =  0.40829
>> ks=sqrt(vm*a(1))
ks =  2.8127
```