社統作業

姓名：王思勻

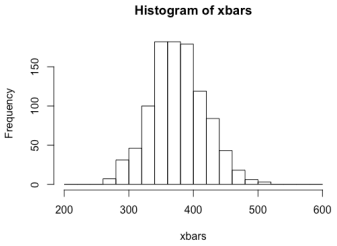
學號：105204027

日期：2016/11/09

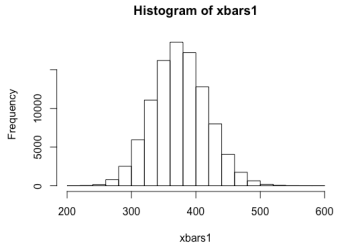
一、

1.

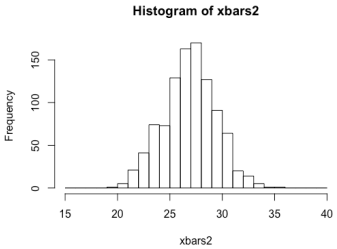
```
> library(XLConnect)
Loading required package: XLConnectJars
XLConnect 0.2-12 by Mirai Solutions GmbH [aut],
  Martin Studer [cre],
  The Apache Software Foundation [ctb, cph] (Apache POI, Apache Commons
    Codec),
  Stephen Colebourne [ctb, cph] (Joda-Time Java library),
  Graph Builder [ctb, cph] (Curvesapi Java library)
http://www.mirai-solutions.com ,
http://miraisolutions.wordpress.com
> sample1990 <- readWorksheetFromFile("/Users/angelwang/Desktop/Sample.
1990.xlsx",sheet=1,header=T)

> xbars <- vector(length = 1000)
> var(sample(x=sample1990$Age,size=120,replace = T))
[1] 420.7361
> for(i in 1:1000){xbars[i]<-var(sample(x=sample1990$Age,size=120,replace = T))}
> hist(xbars,breaks = seq(200,600,20))
> mean(xbars)
[1] 375.9333
```



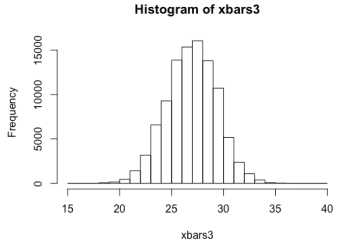

```
> xbars1 <- vector(length = 100000)
> var(sample(x=sample1990$Age,size=120,replace = T))
[1] 308.9745
> for(i in 1:100000){xbars1[i]<-var(sample(x=sample1990$Age,size=120,replace = T))}
> hist(xbars1,breaks = seq(200,600,20))
> mean(xbars1)
[1] 375.2245
```




```
> xbars2 <- vector(length = 1000)
> median(sample(x=sample1990$Age,size=120,replace = T))
[1] 29
> for(i in 1:1000){xbars2[i]<-median(sample(x=sample1990$Age,size=120,replace = T))}
> hist(xbars2,breaks = seq(15,40,1))
> mean(xbars2)
[1] 27.206
```




```
> xbars3 <- vector(length = 100000)
> median(sample(x=sample1990$Age,size=120,replace = T))
[1] 28
> for(i in 1:100000){xbars3[i]<-median(sample(x=sample1990$Age,size=120,replace = T))}
> hist(xbars3,breaks = seq(15,40,1))
> mean(xbars3)
[1] 27.24273
```

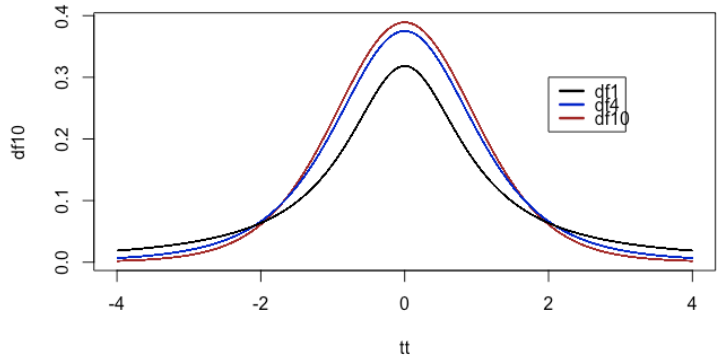


不會更集中，從圖上看不出有太多差距

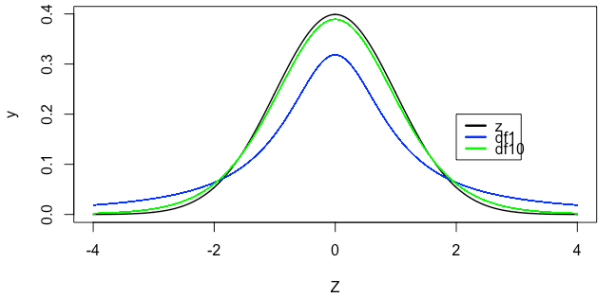
2.

```
> t.10<-abs(round(qt(0.10, df = c(1:30,40,60,120,Inf)),3))
> t.05<-abs(round(qt(0.05, df = c(1:30,40,60,120,Inf)),3))
> t.025<-abs(round(qt(0.025, df = c(1:30,40,60,120,Inf)),3))
> t.01<-abs(round(qt(0.01, df = c(1:30,40,60,120,Inf)),3))
> t.005<-abs(round(qt(0.005, df = c(1:30,40,60,120,Inf)),3))
> t.0005<-abs(round(qt(0.0005, df = c(1:30,40,60,120,Inf)),3))
> df<-c(1:30,40,60,120,Inf)
> t<-cbind.data.frame(df,t.10,t.05,t.025,t.01,t.005,t.0005)
> names(t)<-c("df","0.10","0.05","0.025","0.01","0.005","0.0005")
> t
```

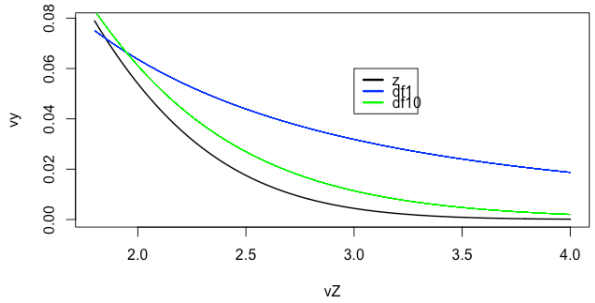
	df	0.10	0.05	0.025	0.01	0.005	0.0005
1	1	3.078	6.314	12.706	31.821	63.657	636.619
2	2	1.886	2.920	4.303	6.965	9.925	31.599
3	3	1.638	2.353	3.182	4.541	5.841	12.924
4	4	1.533	2.132	2.776	3.747	4.604	8.610
5	5	1.476	2.015	2.571	3.365	4.032	6.869
6	6	1.440	1.943	2.447	3.143	3.707	5.959
7	7	1.415	1.895	2.365	2.998	3.499	5.408
8	8	1.397	1.860	2.306	2.896	3.355	5.041
9	9	1.383	1.833	2.262	2.821	3.250	4.781
10	10	1.372	1.812	2.228	2.764	3.169	4.587
11	11	1.363	1.796	2.201	2.718	3.106	4.437
12	12	1.356	1.782	2.179	2.681	3.055	4.318
13	13	1.350	1.771	2.160	2.650	3.012	4.221
14	14	1.345	1.761	2.145	2.624	2.977	4.140
15	15	1.341	1.753	2.131	2.602	2.947	4.073
16	16	1.337	1.746	2.120	2.583	2.921	4.015
17	17	1.333	1.740	2.110	2.567	2.898	3.965
18	18	1.330	1.734	2.101	2.552	2.878	3.922
19	19	1.328	1.729	2.093	2.539	2.861	3.883
20	20	1.325	1.725	2.086	2.528	2.845	3.850
21	21	1.323	1.721	2.080	2.518	2.831	3.819
22	22	1.321	1.717	2.074	2.508	2.819	3.792
23	23	1.319	1.714	2.069	2.500	2.807	3.768
24	24	1.318	1.711	2.064	2.492	2.797	3.745
25	25	1.316	1.708	2.060	2.485	2.787	3.725
26	26	1.315	1.706	2.056	2.479	2.779	3.707
27	27	1.314	1.703	2.052	2.473	2.771	3.690
28	28	1.313	1.701	2.048	2.467	2.763	3.674
29	29	1.311	1.699	2.045	2.462	2.756	3.659
30	30	1.310	1.697	2.042	2.457	2.750	3.646
31	40	1.303	1.684	2.021	2.423	2.704	3.551
32	60	1.296	1.671	2.000	2.390	2.660	3.460
33	120	1.289	1.658	1.980	2.358	2.617	3.373
34	Inf	1.282	1.645	1.960	2.326	2.576	3.291




```
> tt <- seq(-4,4,by=0.0001)
> df10 <- dt(tt,df=10)
> plot(tt,df10,type = "l",col="brown")
> df4 <- dt(tt,df=4)
> lines(tt,df4,type = "l",col="blue3")
> df1 <- dt(tt,df=1)
> lines(tt,df1,type = "l",col="black")
> legend(2,0.3,c("df1","df4","df10"),lty = c(1,1,1),lwd=c(2.5,2.5,2.5),col=c("black","blue3","brown"))
```




```
> Z<-seq(from=-4.00,to=4.00,by=0.01)
> y<-dnorm(Z,mean=0,sd=1)
> plot(x=Z,y=y,type = "l",col="black",lwd=1.5)
> xx <- seq(-4,4,by=0.0001)
> df1 <- dt(xx,df=1)
> lines(xx,df1,type = "l",col="blue")
> df10 <- dt(xx,df=10)
> lines(xx,df10,type = "l",col="green")
> legend(2,0.2,c("z","df1","df10"),lty = c(1,1,1),lwd=c(2.5,2.5,2.5),col=c("black","blue","green"))

> vZ<-seq(from=1.8,to=4.00,by=0.01)
> vy<-dnorm(vZ,mean=0,sd=1)
> plot(x=vZ,y=vy,type = "l",col="black",lwd=1.5)
> vxx <- seq(1.8,4,by=0.0001)
> vdf1 <- dt(vxx,df=1)
> lines(vxx,vdf1,type = "l",col="blue")
> vdf10 <- dt(vxx,df=10)
> lines(vxx,vdf10,type = "l",col="green")
> legend(3,0.06,c("z","df1","df10"),lty = c(1,1,1),lwd=c(2.5,2.5,2.5),col=c(“black","blue","green"))
```



df越大越接近z線

3.

```
> s <- vector(length = 100000)
> for(i in 1:100000){s[i]<-data.frame(table(sample(x=sample1990$Sex,size=20,replace = T)))["1","Freq"]}
> pd<-data.frame(table(s))
> pd$Percent <- pd$Freq/sum(pd$Freq)*100
> ProbabilityDistributionMale <- pd
> names(ProbabilityDistributionMale)<-c("Male","Freq","Percent")
> ProbabilityDistributionMale
```

	Male	Freq	Percent
1	2	14	0.014
2	3	68	0.068
3	4	343	0.343
4	5	1077	1.077
5	6	3108	3.108
6	7	6348	6.348
7	8	10890	10.890
8	9	15041	15.041
9	10	17506	17.506
10	11	16771	16.771
11	12	13195	13.195
12	13	8503	8.503
13	14	4469	4.469
14	15	1881	1.881
15	16	608	0.608
16	17	148	0.148
17	18	28	0.028
18	19	2	0.002

男生為7到11個的機率比較高，其中又以9個的機率最高．男生個數為0,1,20的機率皆為0．