# R입문 기말고사

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## 1번문제

### (1)번

```
A=c(rnorm(1000))
```

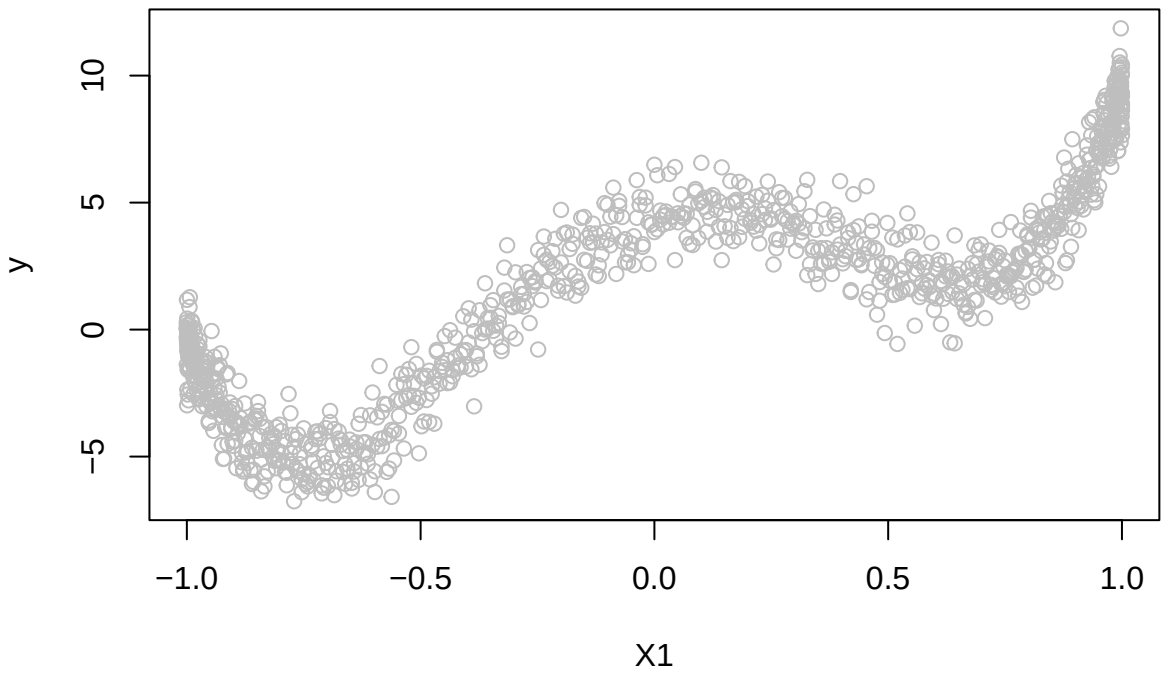
### (2)번

```
myf= function(x){
  sin(2*pi*x/1000)
}
X1=c(myf(1:1000))

myf2 = function(x){
  cos(8*pi*x/1000)
}
X2=c(myf2(1:1000))
```

### (3)번

```
y=c()
y=1.5+5*X1+3*X2+A
plot(X1,y,col='gray')
```




## (4)번

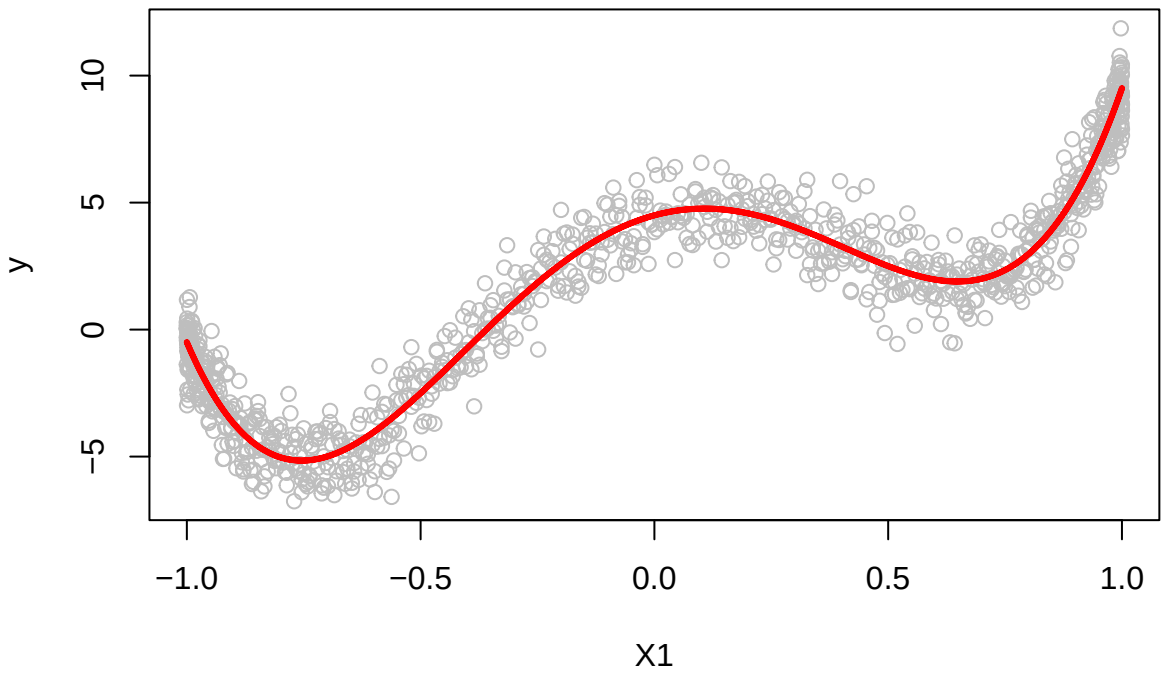
```
z=rep(1,1000)
X=cbind(z,X1,X2)
```

## (5)번

```
B = c(1.5,5,3)
dim(B)
```

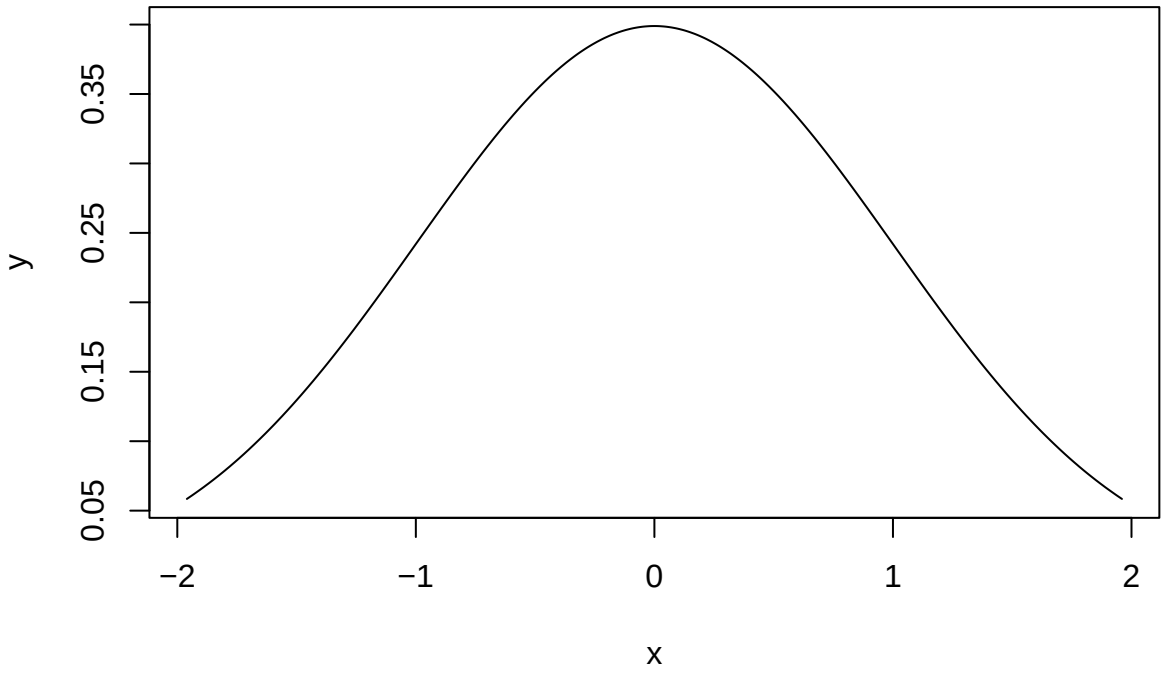
```
## NULL
```

```
dim(B)=c(3,1)
X3=c(X %*% B)
plot(X1,y,col='gray')
lines(X1,X3,col='red',lwd=3)
```

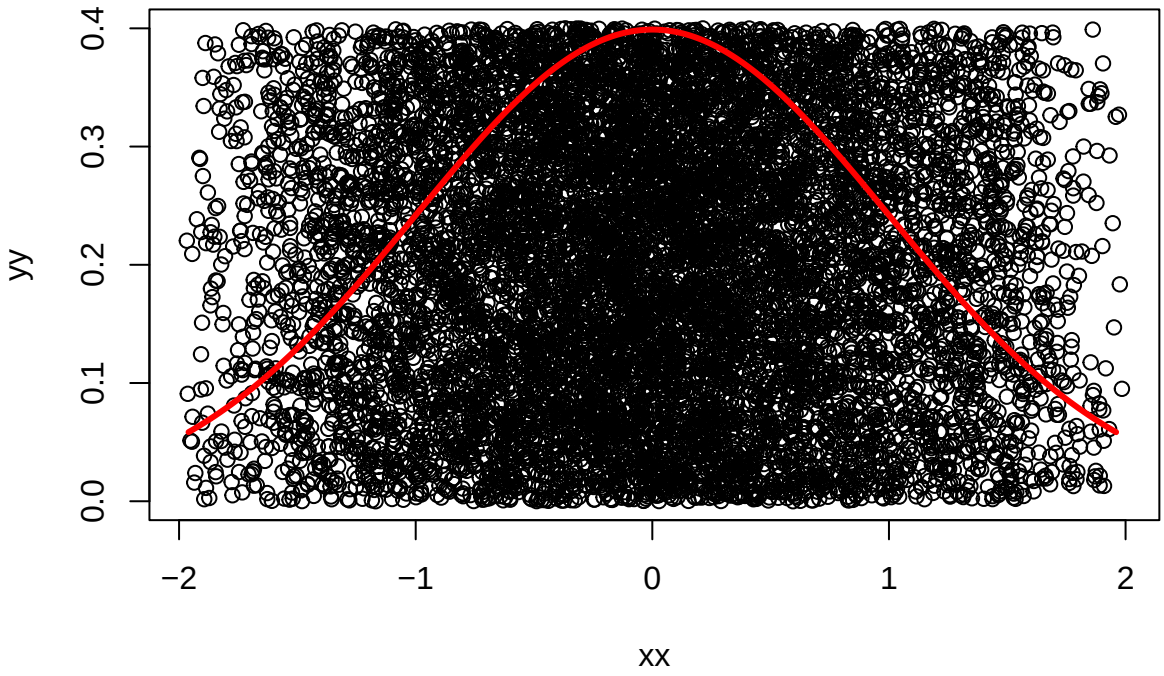

y
10
5
0
−5
−1.0
−0.5
0.0
0.5
1.0
X1

## 2번문제

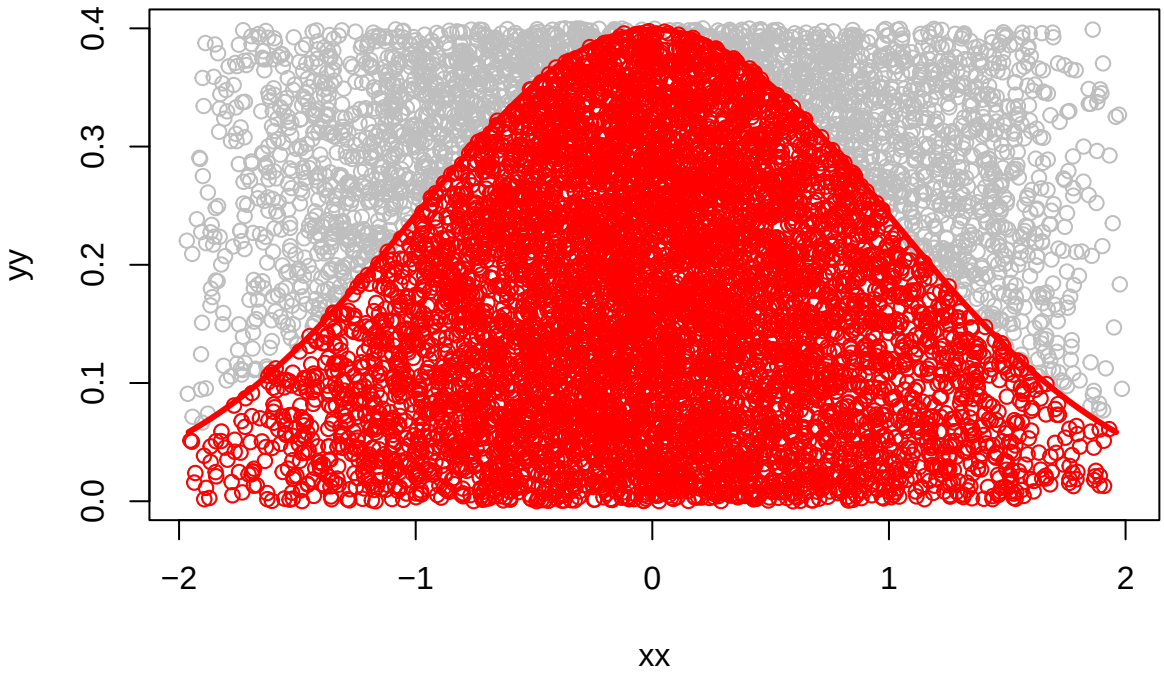
```
x=seq(-1.96,1.96,0.01)
y=1/sqrt(2*pi)*exp(1)^(-1/2*x^2)
plot(x,y,type='l')
```




```
xx=runif(10000)*-2
zz=runif(10000)*2
xx=zz+xx
yy=runif(10000)*0.4
plot(xx,yy)
lines(x,y,col='red',lwd=3)
```




```
plot(xx,yy,col='gray')
lines(x,y,col='red',lwd=3)
test = function(xx,yy){
  yy < 1/sqrt(2*pi)*exp(1)^(-1/2*xx^2)
}
tst = c()
for (i in 1:10000) tst[i] = test(xx[i],yy[i])
points(xx[tst],yy[tst],col='red')
```




```
sum(tst)
```

```
## [1] 7638
```

## (2)번

```
A = as_tibble(rnorm(1000))
A2 = A %>% filter(value<1.96 & value>-1.96)
count(A2)
```

-A2는 약 950이 나옴

# 3번문제

-TypeA

-1)10번 생존(8번은 자동생존)

```
0.5^20
```

```
## [1] 9.536743e-07
```

-2)10번 사망, 9번 생존(8번은 자동생존)

```
surv9_prob=c()
for (i in 1:19) surv9_prob[i]= 0.95^i *0.5^(20-i)
sum(surv9_prob)
```

```
## [1] 0.3983157
```

-3)10번 사망, 9번 사망, 8번 생존

```
surv8_prob=c()
for (i in 0:18) surv8_prob[i+1]=(19-i)*0.5^(19-i)*0.95^i*(0.05)
sum(surv8_prob)
```

```
## [1] 0.04425528
```

-TypeA의 8번 생존확률

```
0.5^20 + sum(surv8_prob) + sum(surv9_prob)
```

```
## [1] 0.4425719
```

-TpyeB

```
8*0.5^20
```

```
## [1] 7.629395e-06
```

-크기비교

```
0.5^20 + sum(surv8_prob) + sum(surv9_prob)>8*0.5^20
```

```
## [1] TRUE
```

-TRUE이므로 TypeA가 생존확률이 높다

# 4번문제

```
df=read_csv('https://raw.githubusercontent.com/guebin/2021IR/master/_notebooks/covid19.c
```

## (1)번

```
df1 = filter(df, year==2020)
sum(df1$cases)
df2 = filter(df,year==2021)
sum(df2$cases)
```

## (2)번

```
df3 = df1 %>% filter(month==2 & day<16)
df3 %>% group_by(prov) %>% summarise(sum(cases))
```

-'경기'에 가장 많은 확진자 발생

## (3)번

```
df4 = df1 %>% filter(month==2 & day>15)
df4 %>% group_by(prov) %>% summarise(sum(cases))
```

-'대구'에 가장 많은 확진자 발생