# R 실습 1 다중회귀모형의 예측



1. 횡단면자료의 예측
2. 시계열자료의 예측

# 1. 횡단면자료의 예측

(1) 모형

$$Money_i = \beta_1 + \beta_2 Win_i + \beta_3 Four_i + \beta_4 Save_i + \beta_5 Lose_i + \beta_6 Year_i + u_i \ (i=1,2,3,\cdots,n)$$

- Money : 연봉(만 원)
- Win(승리게임수, 개)
- Four(포볼수, 개)
- Save(세이브수, 세이브)
- Lose(패한 게임수, 패)
- Year(활동 시즌수, 년)

(2) 예측 전제

- Win = 14승
- Save = 5 세이브
- Year = 10년

(chap4-R-1.R)

```
library(openxlsx)
library(stargazer)
library(car)

sample1<-read.xlsx("http://kanggc.iptime.org/data/pitcher.xlsx")

money<-sample1$MONEY
win<-sample1$WIN
four<-sample1$FOUR
save<-sample1$SAVE
lose<-sample1$LOSE
year<-sample1$YEAR

ols1<-lm(money~win+four+save+lose+year)
summary(ols1)

jointHo<-c("four","lose")
linearHypothesis(ols1, jointHo)

ols2<-lm(money~win+save+year)
summary(ols2)

stargazer(ols1, ols2, type="text")

new<-data.frame(win=14, save=5, year=10)
predict(lm(money~win+save+year), new, se.fit=T)

pred.w.clim<-predict(lm(money~win+save+year), new, interval="confidence")
pred.w.clim

pred.w.plim<-predict(lm(money~win+save+year), new, interval="prediction")
pred.w.plim
```

# 2. 시계열자료의 예측

(1) 모형

$$\ln(M1_t) = \beta_1 + \beta_2 \ln(GDP_t) + \beta_3 \ln(CPI)_t + \beta_4 R_t + u_t \ (t=1,2,3,\cdots,T)$$

- M1 : 통화량(십억 원)
- GDP : 국내총생산(십억 원)
- CPI : 소비자물가지수
- R : 정기예금금리(%)

(2) 예측 전제(시나리오)

| 구분 | 시나리오 1 | 시나리오 2 |
|---|---|---|
| GDP 증가율(%) | 0.25 | 0.6 |
| CPI 상승률(%) | 0.25 | 0.6 |
| R 변화(%p) | −0.5 | −0.25 |

## (chap4-R-2.R)

```
library(openxlsx)
library(stargazer)

sample1<-read.xlsx("http://kanggc.iptime.org/data/quarter.xlsx")

m1<-ts(sample1$m1, start=c(1986, 4), frequency=4)
gdp<-ts(sample1$gdp, start=c(1986, 4), frequency=4)
cpi<-ts(sample1$cpi, start=c(1986, 4), frequency=4)
r<-ts(sample1$r, start=c(1986, 4), frequency=4)

lm1=log(m1)
lgdp=log(gdp)
lcpi=log(cpi)

ols1<-lm(lm1~lgdp+lcpi+r)
summary(ols1)

gdp_1=gdp[140]*1.0025
cpi_1=cpi[140]*1.0025
r_1=r[140]-0.5

scen1<-data.frame(lgdp=log(gdp_1), lcpi=log(cpi_1), r=r_1)
predict(lm(lm1~lgdp+lcpi+r), scen1, se.fit=T)
pred.w.clim_scen1<-predict(lm(lm1~lgdp+lcpi+r), scen1, interval="confidence")
pred.w.clim_scen1
pred.w.plim_scen1<-predict(lm(lm1~lgdp+lcpi+r), scen1, interval="prediction")
pred.w.plim_scen1

gdp_2=gdp[140]*1.006
cpi_2=cpi[140]*1.006
r_2=r[140]-0.25

scen2<-data.frame(lgdp=log(176556.9), lcpi=log(116.2), r=3.18)
predict(lm(lm1~lgdp+lcpi+r), scen2, se.fit=T)
pred.w.clim_scen2<-predict(lm(lm1~lgdp+lcpi+r), scen2, interval="confidence")
pred.w.clim_scen2
pred.w.plim_scen2<-predict(lm(lm1~lgdp+lcpi+r), scen2, interval="prediction")
pred.w.plim_scen2
```