

## 데이터문제해결1 과제3

컴퓨터공학과 17011599 안정연

1. Library(MASS) 를 통해 birthwt 데이터를 불러온다.

```
> library(MASS)
> birthwt
      low age lwt race smoke ptl ht ui ftv  bwt
85      0  19 182   2     0   0  0  1   0 2523
86      0  33 155   3     0   0  0  0   3 2551
87      0  20 105   1     1   0  0  0   1 2557
88      0  21 108   1     1   0  0  1   2 2594
89      0  18 107   1     1   0  0  1   0 2600
91      0  21 124   3     0   0  0  0   0 2622
```

2. 인종과 흡연유무에 따른 평균 bwt를 따로 테이블로 추출한다.

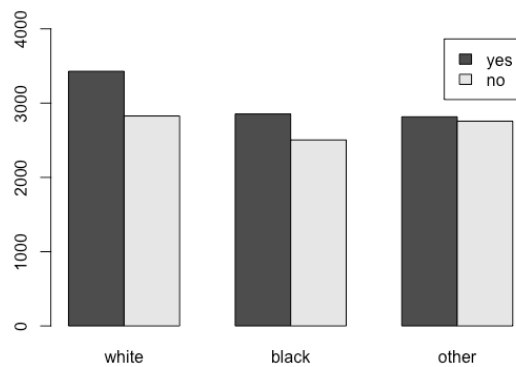
```
> tx <- birthwt %>%
+ group_by(race,smoke) %>%
+ summarise(bwt_mean = mean(bwt),bwt_sd = sd(bwt))
`summarise()` regrouping output by 'race' (override with `.`groups` argument)
> tx
# A tibble: 6 x 4
# Groups:   race [3]
   race smoke bwt_mean bwt_sd
  <int> <int>   <dbl>  <dbl>
1     1     0   3429.   710.
2     1     1   2827.   626.
3     2     0   2854.   621.
4     2     1   2504.   637.
5     3     0   2816.   709.
6     3     1   2757.   810.
```

3. Standard error를 구하기 위해 다음과 같이 데이터를 처리해준다.

```
> bwt.mean <- tx['bwt_mean']
> bwt.sd <- tx['bwt_sd']
> bwt.sd.u <- bwt.mean[1:6,] + bwt.sd[1:6,]
> bwt.sd.u
      bwt_mean
1 4138.849
2 3453.319
3 3475.754
4 3141.057
5 3525.131
6 3567.211
> bwt.sd.l <- bwt.mean[1:6,] - bwt.sd[1:6,]
> bwt.sd.l
      bwt_mean
1 2718.651
2 2200.374
3 2233.246
4 1866.943
5 2106.432
6 1947.122
```

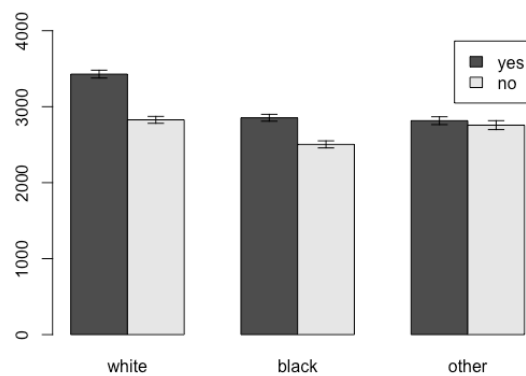
4. Barplot을 이용하여 그래프를 그린다.

```
> b<-barplot(t1, beside = TRUE, ylim = c(0,4000),legend.text = c("yes","no"),names=c("white","black","other"))
```



5. arrows 함수를 이용해 오차그래프를 그린다.

```
> arrows(b,as.matrix(bwt.sd.u),b,as.matrix(bwt.sd.l),angle = 90,length = 0.08, code=3)
```



6. Black의 경우 smoking 별 차이가 유의미하다는 아이콘과 설명을 추가한다.

```
> axis(1,at = c(4.5,5.5),tick = TRUE, pos = 3100, label=c("", ""))
> text(5,3100,"**",pos = 3,offset = -0.05)
```

