한국인의 삶을 파악하라(1) - 나이와 월급의 관계 ¶

- 몇살때 월급을 가장 많이 받을까?
- 대상 변수 : 나이(birth), 월급(income)

- 2006~2015년까지 전국에서 7000여 가구를 선정하여 매년 추적 조사한 자료
- 데이터 셋 : Koweps_hpc10_2015_beta1.sav
  - 2016년도 발간한 복지패널 데이터 6,914가구, 16,664명에 대한 정보

In [45]:

```
# install.packages("foreign")
```

In [46]:

```
library(foreign)
library(dplyr)
library(ggplot2)
library(readxl)
```

In [47]:

```
dat_welfare <- read.spss(file="D:WWdatasetWWR_DoitWWKoweps_hpc10_2015_beta1.sav", to.data.frame=T)
welfare <- dat_welfare
```

```
Warning message in read.spss(file = "D:WWdatasetWWR_DoitWWKoweps_hpc10_2015_beta1.sa
v", :
"D:WdatasetWR_DoitWKoweps_hpc10_2015_beta1.sav: Compression bias (0) is not the usua
l value of 100"
```

In [48]:

```
welfare <- rename(welfare,
                  sex=h10_g3,
                  birth=h10_g4,
                  marriage=h10_g10,
                  religion=h10_g11,
                  income=p1002_8aq1,
                  code_job=h10_eco9,
                  code_region=h10_reg7)
names(welfare)
```

'h10_id' 'h10_ind' 'h10_sn' 'h10_merkey' 'h_new' 'h10_cobf' 'h10_reg5'
'code_region' 'h10_din' 'h10_cin' 'h10_flag' 'p10_wgl' 'p10_wsl' 'p10_wgc' 'p10_wsc'
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'c1007_4aq16' 'c1007_4aq17' 'c1007_4aq18' 'c1007_4aq19' 'c1007_4aq20'
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'h10_pers_income3' 'h10_pers_income4' 'h10_pers_income5'

In [49]:

```
welfare <- select(welfare, sex, birth, marriage, religion, income, code_job, code_region)
names(welfare)
```

'sex' 'birth' 'marriage' 'religion' 'income' 'code_job' 'code_region'

01 변수 확인

In [50]:

```
class(welfare$birth)
class(welfare$income)

dim(welfare)
head(welfare)
```

'numeric'

'numeric'

16664 7

sex	birth	marriage	religion	income	code_job	code_region
2	1936	2	2	NA	NA	1
2	1945	2	2	NA	NA	1
1	1948	2	2	120	942	1
1	1942	3	1	200	762	1
2	1923	2	1	NA	NA	1
1	1962	1	1	NA	530	1

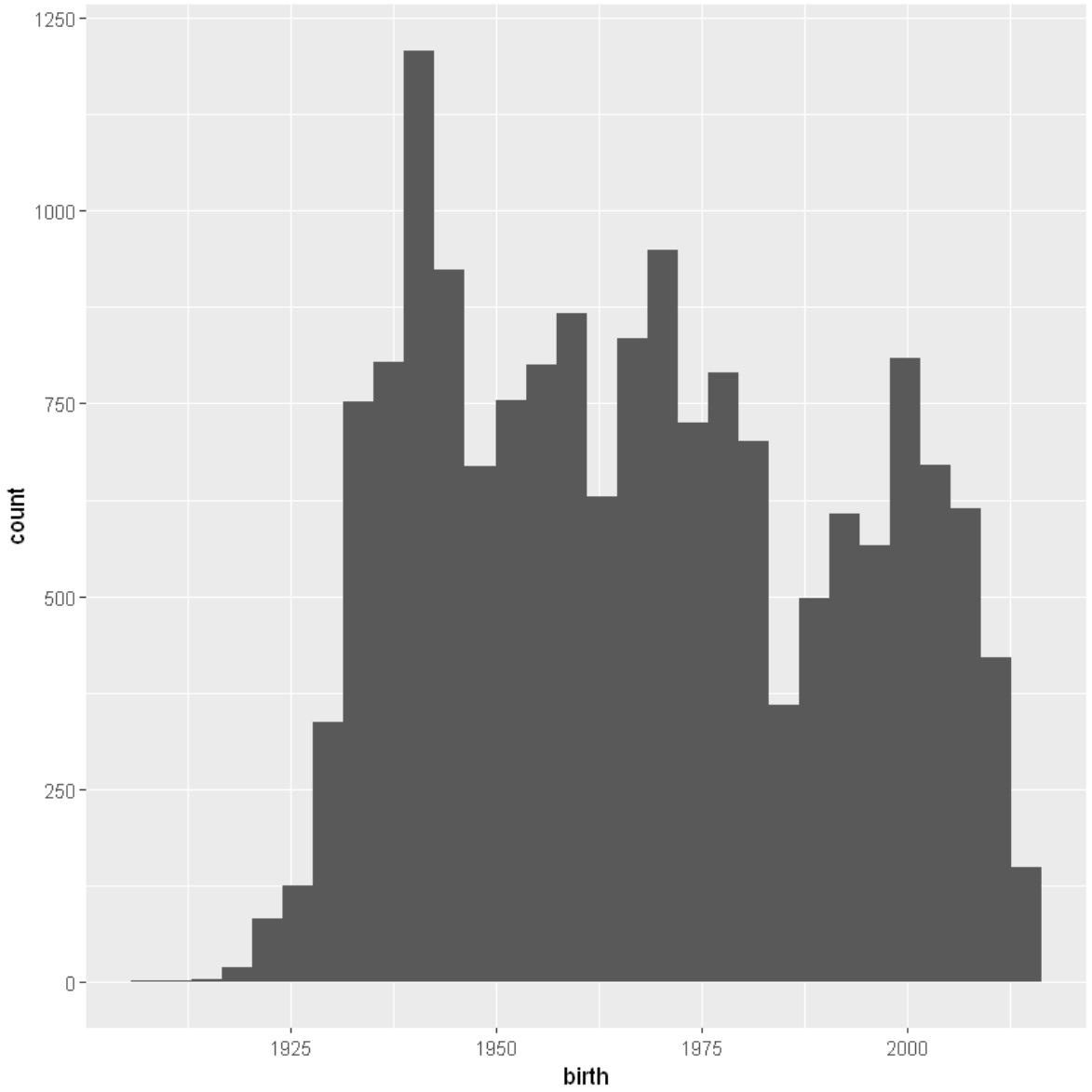
birth 살펴보기

In [51]:

```
summary(welfare$birth)
ggplot(welfare, aes(x=birth)) + geom_histogram()
```

```
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
   1907    1946    1966    1968    1988    2014
```

```
`stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```



02 결측치 확인 및 파생변수 생성

- 1900~2014사이의 값을 지니고, 모름/무응답은 9999로 코딩되어 있음.

In [52]:

```
table(is.na(welfare$birth))
```

```
FALSE
16664
```

In [53]:

```
## 만약 결측치가 있다면 다음과 같이 처리 가능
welfare$birth <- ifelse(welfare$birth==9999, NA, welfare$birth)
table(is.na(welfare$birth))
```

```
FALSE
16664
```

나이변수(age) 만들기

- 2015년도 조사 진행. 2015에서 연도를 뺀 후, 1년을 더하면 된다.
- age <- 2015 - welfare$birth + 1

In [54]:

```
welfare$age <- 2015 - welfare$birth + 1
welfare
```

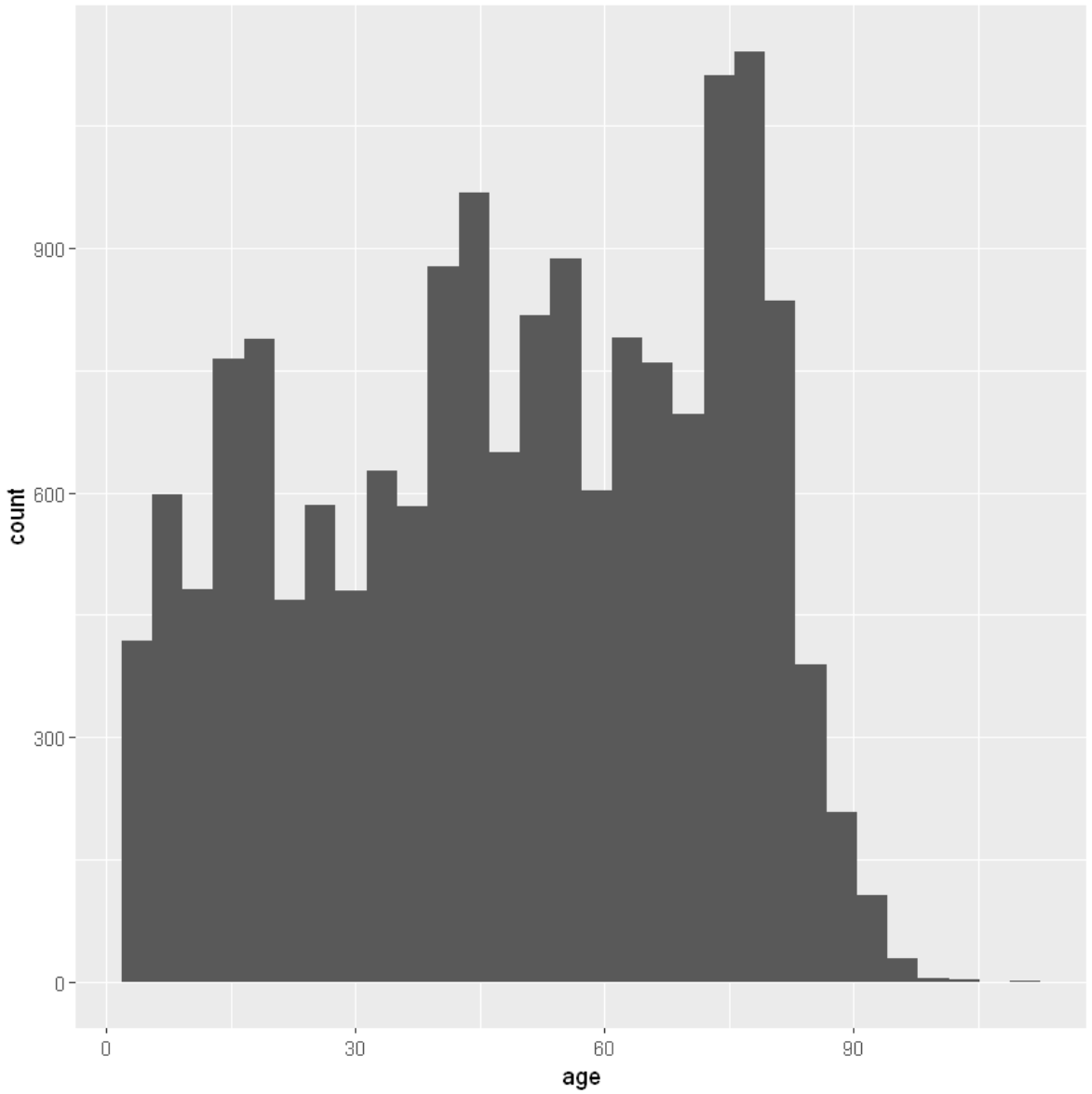
sex	birth	marriage	religion	income	code_job	code_region	age
2	1936	2	2	NA	NA	1	80
2	1945	2	2	NA	NA	1	71
1	1948	2	2	120	942	1	68
1	1942	3	1	200	762	1	74
2	1923	2	1	NA	NA	1	93
1	1962	1	1	NA	530	1	54
2	1963	1	1	NA	NA	1	53
2	2003	0	1	NA	NA	1	13
1	1927	1	1	NA	NA	1	89
2	1934	1	1	NA	NA	1	82
2	1930	2	2	NA	NA	7	86
1	1956	1	2	NA	NA	7	60
2	1960	1	2	NA	NA	7	56
2	1940	2	1	NA	NA	2	76
2	1970	3	1	NA	NA	1	46
2	1992	5	1	NA	NA	1	24
1	1940	1	2	NA	NA	1	76
2	1941	1	2	NA	NA	1	75
1	1962	5	2	40	999	1	54
1	1978	1	2	350	312	1	38
2	1975	1	2	200	254	1	41
2	2004	0	2	NA	NA	1	12
2	2008	0	2	NA	NA	1	8
1	1941	1	1	NA	NA	1	75
2	1942	1	1	150	510	1	74
1	1964	5	2	NA	530	1	52
2	1940	2	2	NA	NA	1	76
1	1975	5	1	NA	286	1	41
1	1978	1	2	NA	521	1	38
2	1961	1	2	NA	NA	1	55
...	...	...	...	...	...	...	...
2	1934	1	2	NA	NA	6	82
1	1942	1	1	75.00	873	6	74
2	1945	1	1	NA	NA	6	71
1	1945	1	2	NA	NA	6	71
2	1948	1	2	NA	NA	6	68

sex	birth	marriage	religion	income	code_job	code_region	age
1	1956	3	1	162.00	873	6	60
1	1941	1	2	NA	611	6	75
2	1939	1	2	NA	611	6	77
1	1966	1	1	188.00	873	6	50
2	1962	1	1	90.00	899	6	54
2	1993	5	1	NA	NA	6	23
1	2000	0	1	NA	NA	6	16
2	2003	0	1	NA	NA	6	13
1	1944	1	2	NA	611	6	72
2	1947	1	2	NA	611	6	69
1	1933	1	2	NA	NA	6	83
2	1947	1	1	NA	NA	6	69
1	1933	1	2	NA	611	6	83
2	1934	1	2	NA	611	6	82
2	1934	2	1	NA	NA	6	82
1	1956	1	2	187.66	743	6	60
2	1958	1	1	NA	611	6	58
1	1932	1	2	NA	NA	6	84
2	1933	1	2	NA	NA	6	83
1	1967	1	1	NA	874	5	49
2	1967	1	1	NA	NA	5	49
2	1992	5	1	302.50	314	5	24
1	1995	5	1	NA	NA	5	21
2	1998	0	1	NA	NA	5	18
1	2001	0	1	NA	NA	5	15

In [55]:

```
ggplot(welfare, aes(x=age)) + geom_histogram()
```

```
`stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```



03 나이(age)와 월급(income)의 관계 분석

(가) 나이에 따른 월급 평균표만들기

In [56]:

```
age_income <- welfare %>%
              filter(!is.na(income)) %>%
              group_by(age) %>%
              summarise(mean_income = mean(income))
head(age_income)
```

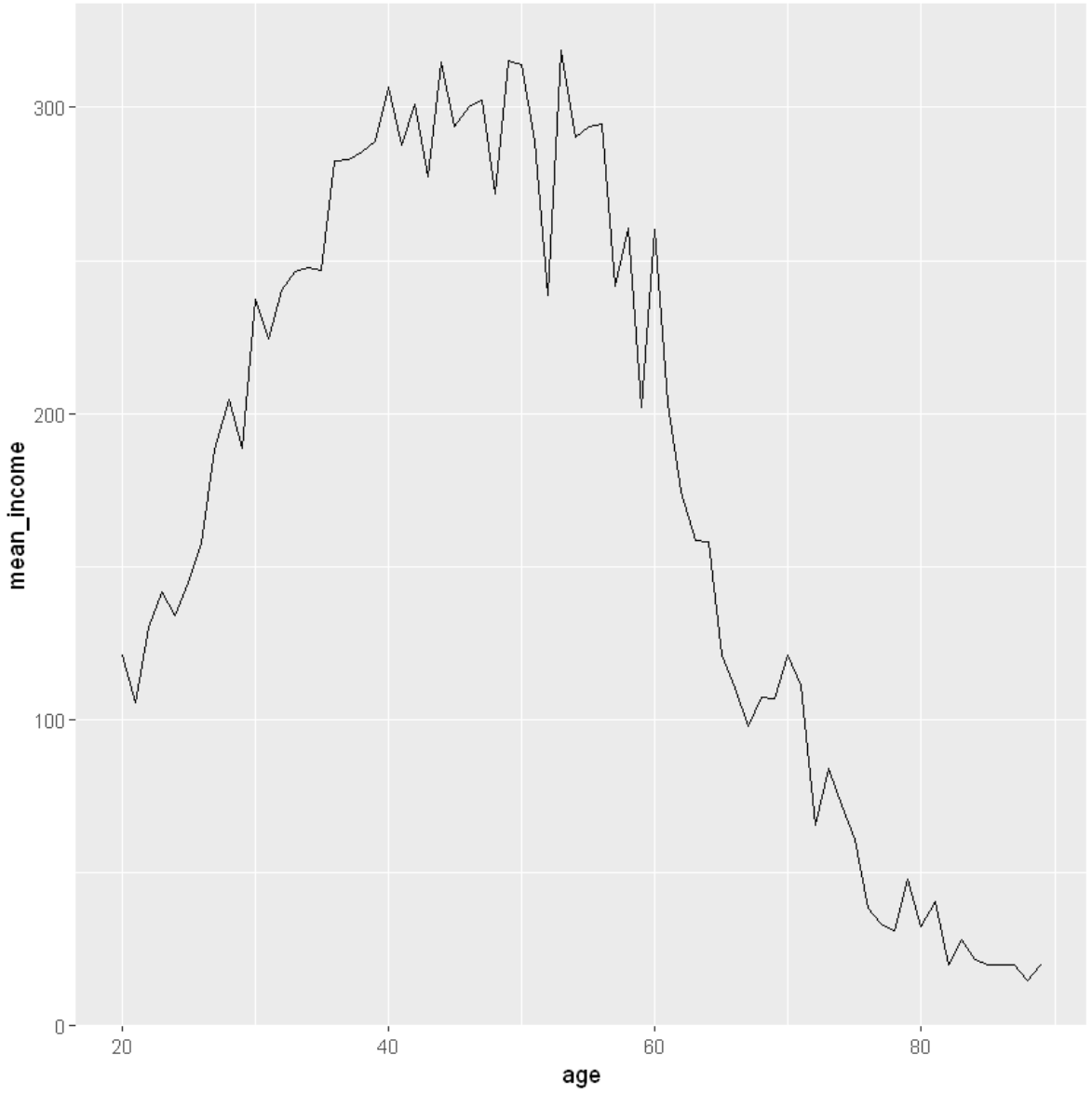
age	mean_income
20	121.3000
21	105.5185
22	130.0923
23	141.7157
24	134.0877
25	144.6559

(나) ggplot를 이용한 그래프 그리기

- x축 : age, y축 : 월급평균(mean_income)

In [57]:

```
ggplot(age_income, aes(x=age, y=mean_income)) + geom_line()
```



한국인의 삶을 파악하라(2) - 나이와 월급의 관계

- 어떤 연령의 월급이 가장 많이 받을까?
- 대상 변수 : 나이(birth)=> 연령대(class), 월급(mean_income)

In [58]:

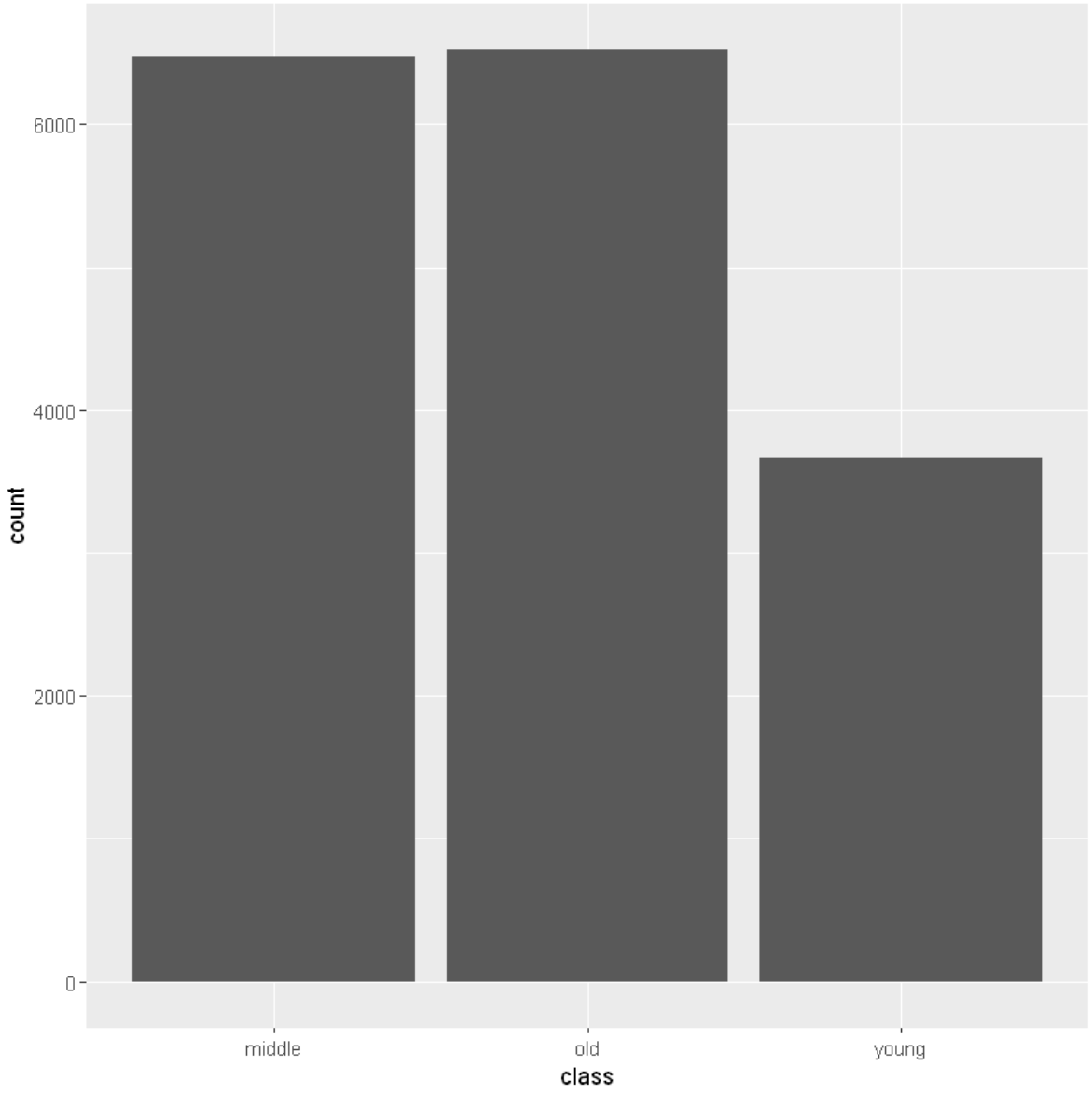
```
welfare <- welfare %>%
           mutate(class=ifelse(age<25, 'young',
                               ifelse(age >= 59, "middle", "old")))
table(welfare$class)
```

```
middle    old  young
  6475   6522   3667
```

막대 그래프

In [59]:

```
ggplot(welfare, aes(x=class)) + geom_bar()
```



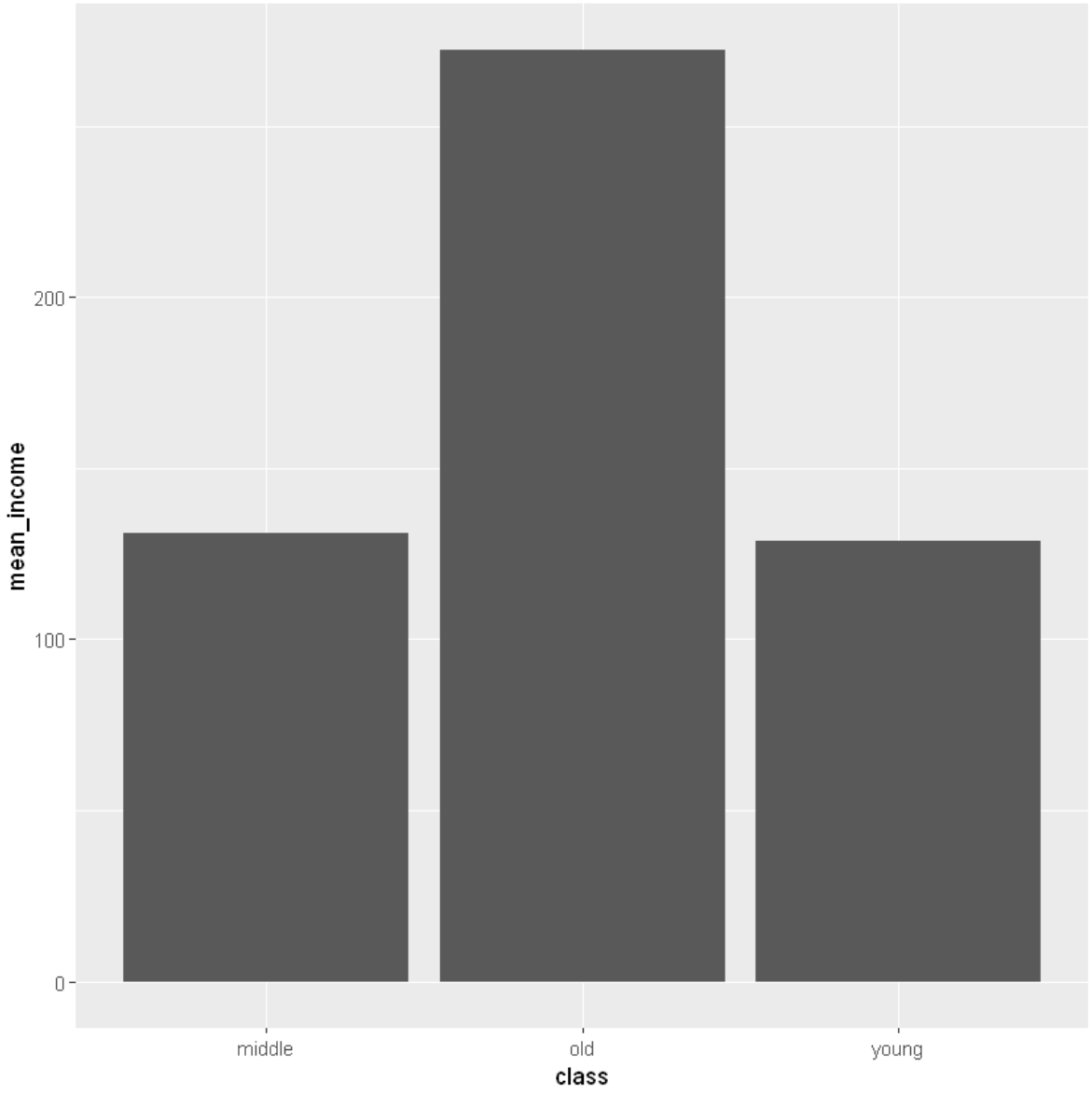
In [60]:

```
### 연령대별 월급 평균표 만들기
class_income <- welfare %>% filter(!is.na(income)) %>%
                           group_by(class) %>%
                           summarise(mean_income = mean(income))
class_income
```

class	mean_income
middle	131.0803
old	272.2487
young	128.5538

In [61]:

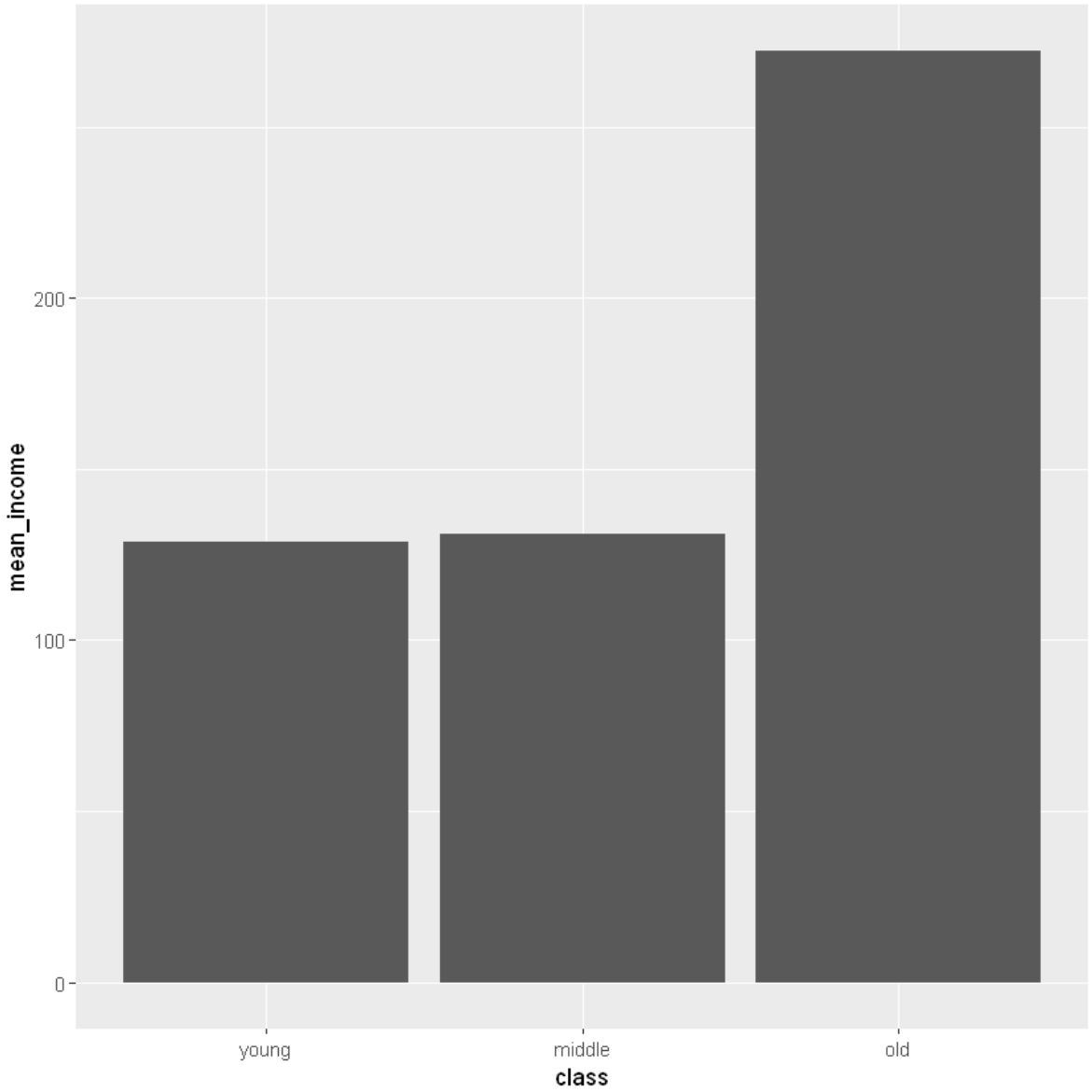
```
ggplot(class_income, aes(x=class, y=mean_income)) + geom_col()
```



x축의 값을 초년, 중년, 노년의 나이 순으로 정렬하도록 설정

In [62]:

```
ggplot(class_income, aes(x=class, y=mean_income)) + geom_col() +
            scale_x_discrete(limits = c('young', 'middle', 'old'))
```



확인

- 중년이 280만원 정도로 가장 높다.
- 노년은(131만) 초년이 받는 것보다 적은 월급(128만원)

(실습과제) P2-1

- (가) 10대, 20대, ...,60대, 기타 연령대로 나누고 가장 수입을 많이 받는 연령대는?
- (나) 10대, 20대, ...,60대, 기타 연령대로 나누고 가장 수입을 적게 받는 연령대는?

한국인의 삶을 파악하라(3) - 연령대 및 성별 월급 차이

- 성별 월급 차이는 연령대별로 다를까?
- 대상 변수 : 나이(birth)=> 연령대(class), 월급(mean_income), 성별(sex)

In [63]:

```
names(welfare)
```

'sex' 'birth' 'marriage' 'religion' 'income' 'code_job' 'code_region' 'age' 'class'

In [64]:

```
summary(welfare)
head(welfare$sex)
table(welfare$sex)
```

```
      sex            birth         marriage        religion
 Min.   :1.000   Min.   :1907   Min.   :0.000   Min.   :1.000
 1st Qu.:1.000   1st Qu.:1946   1st Qu.:1.000   1st Qu.:1.000
 Median :2.000   Median :1966   Median :1.000   Median :2.000
 Mean   :1.545   Mean   :1968   Mean   :1.648   Mean   :1.517
 3rd Qu.:2.000   3rd Qu.:1988   3rd Qu.:2.000   3rd Qu.:2.000
 Max.   :2.000   Max.   :2014   Max.   :6.000   Max.   :2.000

     income          code_job       code_region         age
 Min.   :   0.0   Min.   : 111.0   Min.   :1.000   Min.   :  2.00
 1st Qu.: 122.0   1st Qu.: 314.0   1st Qu.:2.000   1st Qu.: 28.00
 Median : 192.5   Median : 611.0   Median :3.000   Median : 50.00
 Mean   : 241.6   Mean   : 591.2   Mean   :3.705   Mean   : 48.43
 3rd Qu.: 316.6   3rd Qu.: 863.0   3rd Qu.:6.000   3rd Qu.: 70.00
 Max.   :2400.0   Max.   :1012.0   Max.   :7.000   Max.   :109.00
 NA's   :12030    NA's   :9135
    class
 Length:16664
 Class :character
 Mode  :character
```

2 2 1 1 2 1

```
   1    2
7578 9086
```

연령대 및 성별 월급 평균표 만들기

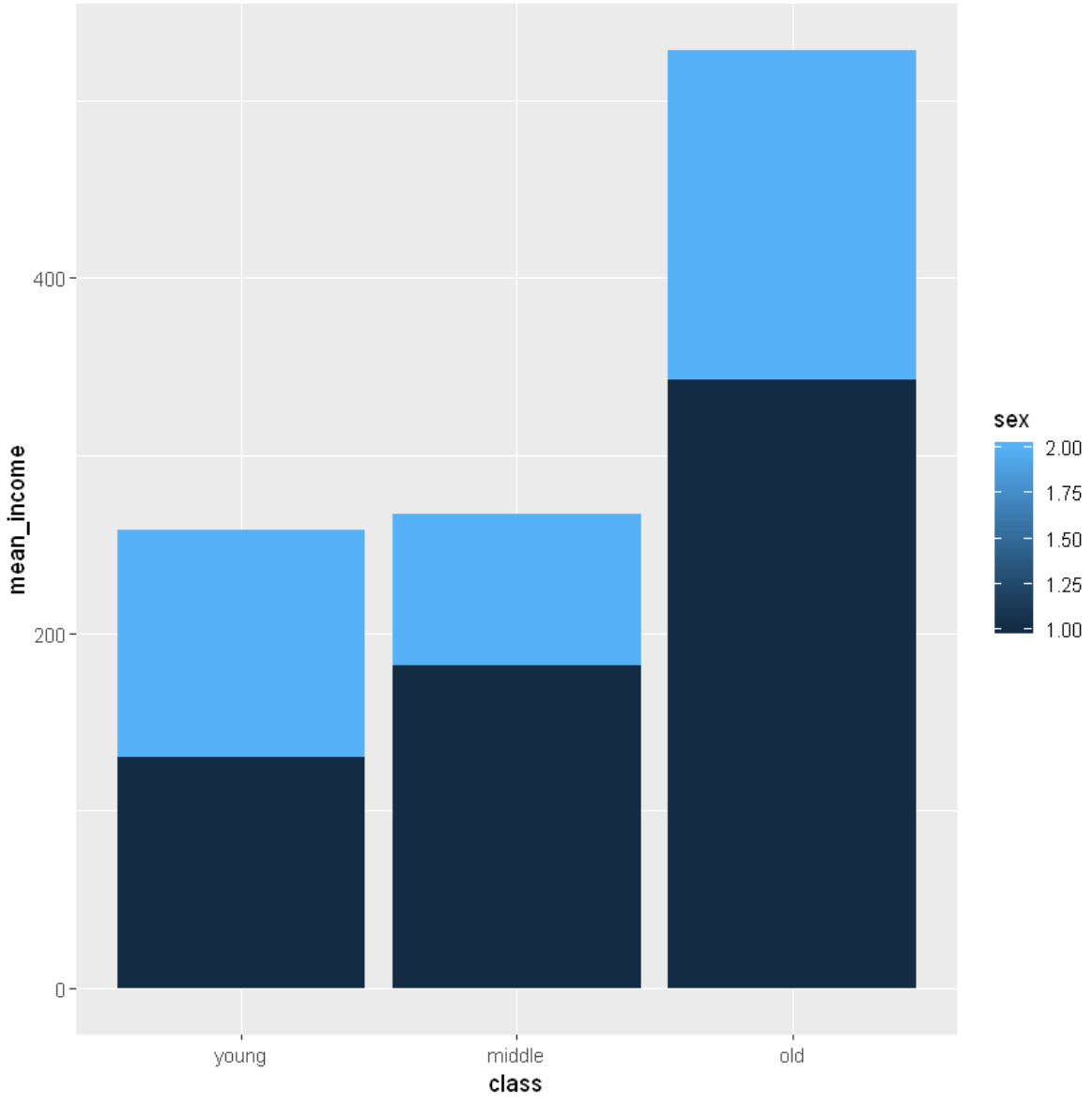
In [65]:

```
sex_income <- welfare %>% filter(!is.na(income)) %>%
                group_by(class, sex) %>%
                summarise(mean_income = mean(income))
sex_income
```

class	sex	mean_income
middle	1	181.82479
middle	2	85.24303
old	1	342.73009
old	2	185.72525
young	1	130.24825
young	2	127.85505

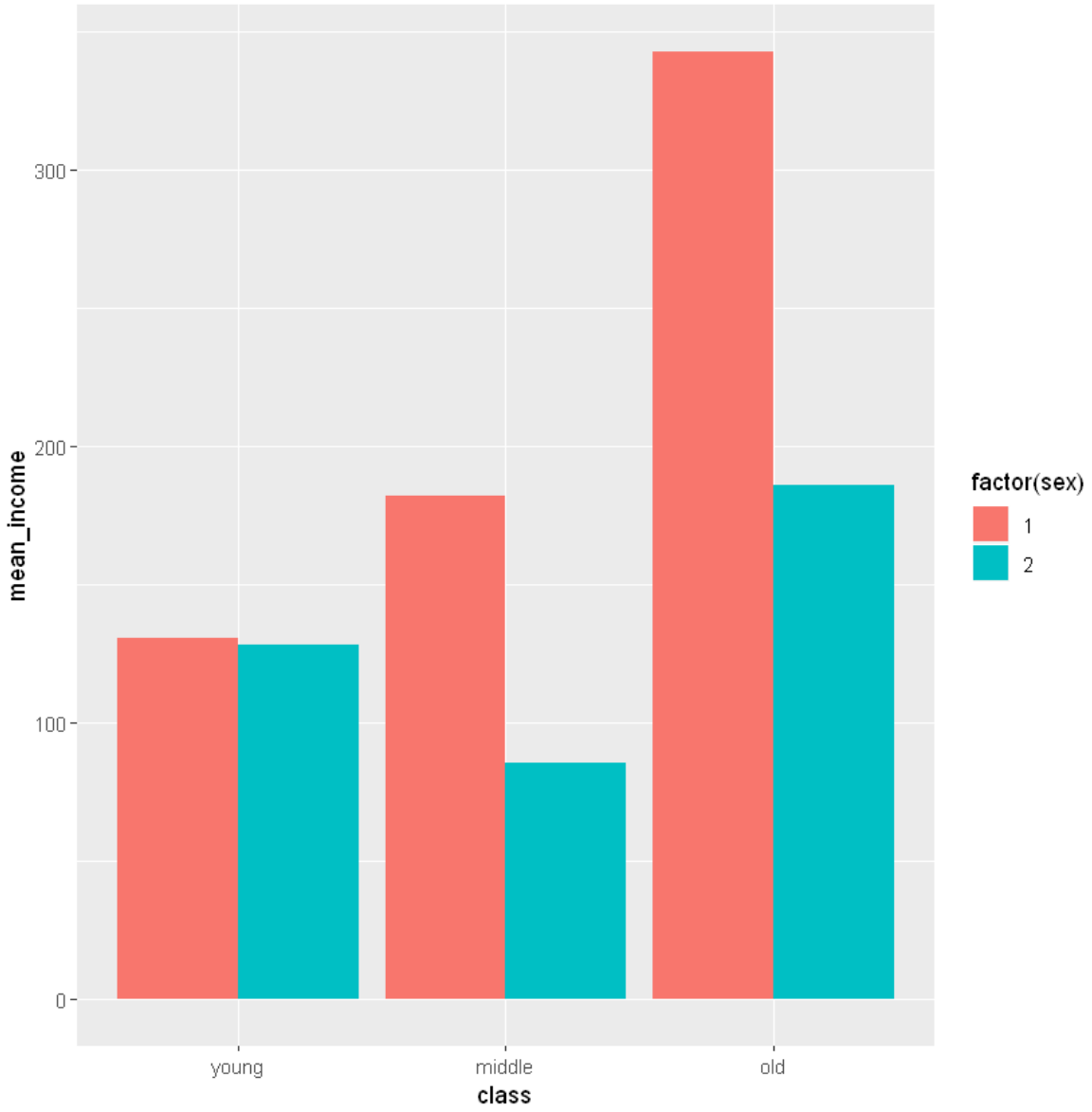
In [66]:

```
ggplot(data=sex_income, aes(x=class, y=mean_income, fill=sex)) +   # fill=성별에 따른 색깔 표시
             geom_col() +                                          # 그래프 종류
             scale_x_discrete(limits=c("young", "middle", "old"))  # 축 순서 설정
```



In [73]:

```
ggplot(data=sex_income, aes(x=class, y=mean_income, fill=factor(sex))) +   # fill=성별에 따른 색깔
            geom_col(position="dodge") +                                   # 그래프 종류
            scale_x_discrete(limits=c("young", "middle", "old"))   # 축 순서 설정
```



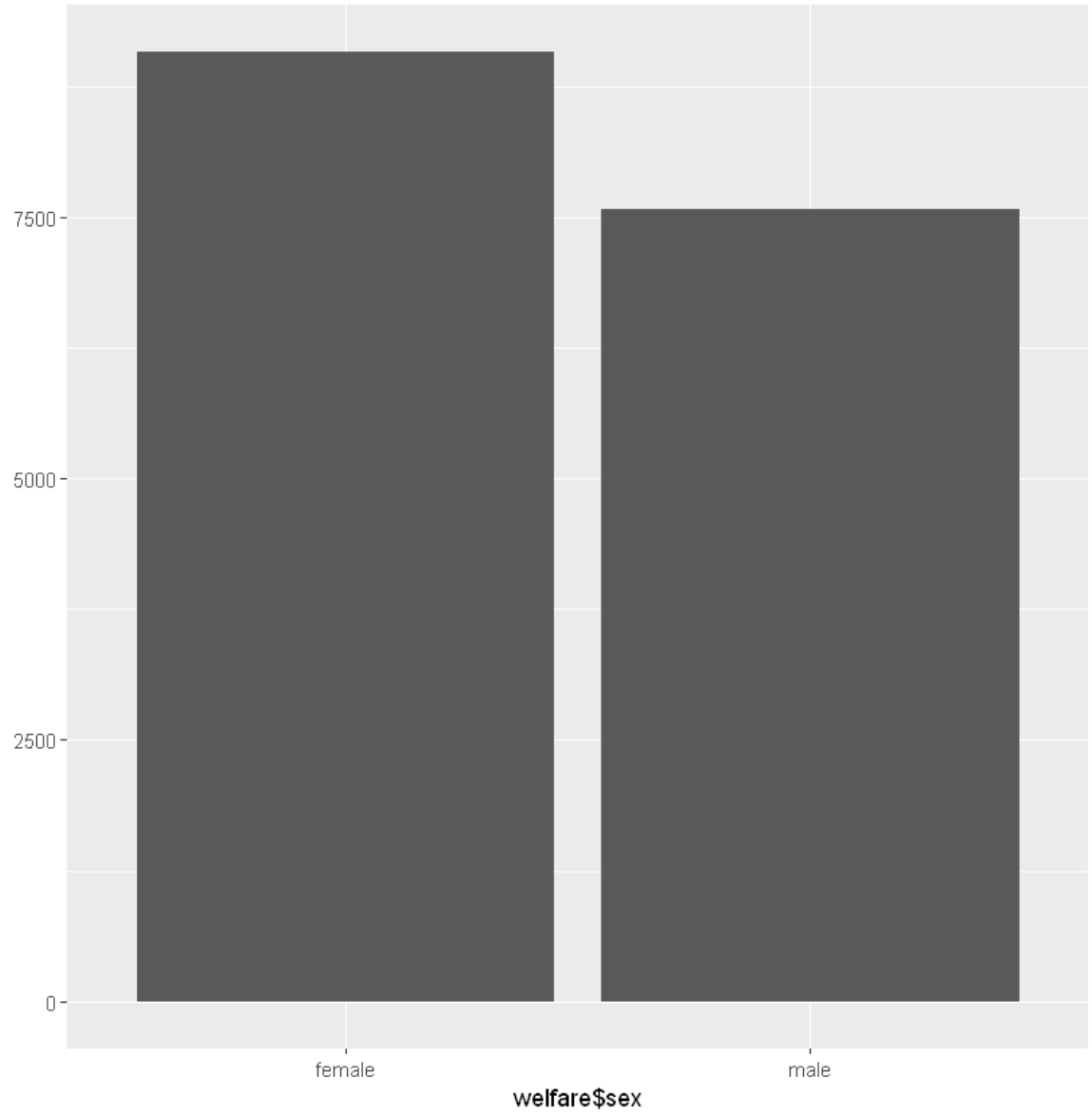
(실습과제) p2-2

- (가) 성별(1,2)를 'male', 'female'로 변경해 보자.
- (나) 연령대별 성별 그래프를 만들어보자
- (다) 성별과 어떤 연령대의 사람들이 많이 수입을 받는가? 남녀의 차이가 가장 적은 연령대는 어떤 연령대인가?

연령대 구분없이 나이와 성별을 이용한 평균표

In [68]:

```
welfare$sex <- ifelse(welfare$sex==1, 'male', 'female')
qplot(welfare$sex)
```



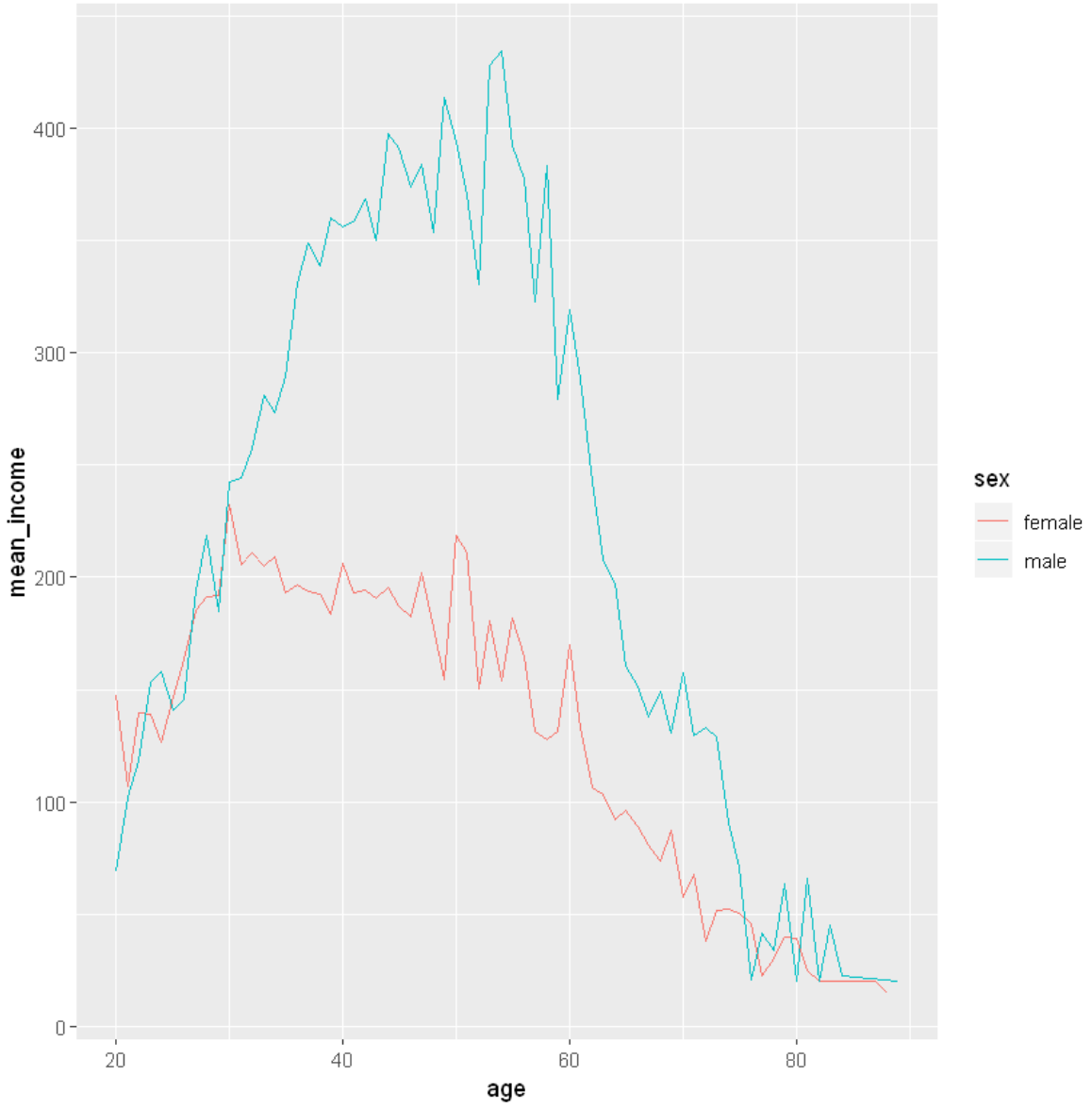
In [70]:

```
sex_age <- welfare %>%
          filter(!is.na(income)) %>%
          group_by(age, sex) %>%
          summarise(mean_income=mean(income))
head(sex_age)
```

age	sex	mean_income
20	female	147.4500
20	male	69.0000
21	female	106.9789
21	male	102.0500
22	female	139.8547
22	male	118.2379

In [71]:

```
ggplot(data=sex_age, aes(x=age, y=mean_income, col=sex)) + geom_line()
```



fill vs col : fill은 색 채우기, col : 테두리 색

In [ ]:

```

```