````
---
title: "Chosun Population and Housholds"
output: html_document
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## Problem

오기수 교수의 논문 조선시대 각 도별 인구 및 전답과 조세부담액 분석에 등장하는 __연도별 호수 및 인구와 호당인구__ 를 도표로 제시

```{r}
knitr::include_graphics("../pics/chosun_population_households.png", dpi = 96)
```

## Data

```{r, data}
Years <- c(1404, 1406, 1432, 1648, 1657, 1669, 1672, 1678, 1717, 1724, 1726, 1777)
Households <- c(153403, 180246, 201853, 441321, 658771, 1313453, 1178144, 1342428,
1560561, 1572086, 1576598, 1715371)
Population <- c(322746, 370365, 692475, 1531365, 2290083, 5018644, 4701359, 5246972,
6846568, 6865286, 7032425, 7238546)
chosun.df <- data.frame(Years, Households, Population)
str(chosun.df)
```

## Plot (R Base)

```{r, base plot, fig.width = 9, fig.height = 6.75}
par(family = "HCR Dotum LVT")
plot(Population / 10000 ~ Years,
     data = chosun.df,
     type = "b",
     pch = 21,
     col = "red",
     bg = "white",
     ylim = c(0, 800),
     xaxt = "n",
     yaxt = "n",
     ann = FALSE)
lines(Households / 10000 ~ Years,
      data = chosun.df,
      type = "b",
      pch = 21,
      col = "blue",
      bg = "white")
Years.ticks <- c(1404, 1432, 1648, 1669, 1678, 1717, 1777)
Years %in% Years.ticks
Households.ticks <- Households[Years %in% c(1404, 1669, 1777)]
Population.ticks <- Population[Years %in% c(1404, 1432, 1648, 1657, 1669, 1717, 1777)]
y.breaks <- c(Population.ticks, Households.ticks) / 10000
y.labels <- format(c(Population.ticks, Households.ticks) / 10000, digits = 3, nsmall = 0)
axis(side = 1,
     at = Years.ticks,
     labels = Years.ticks,
     las = 2)
axis(side = 2,
     at = c(Population.ticks, Households.ticks) / 10000,
     labels = format(c(Population.ticks, Households.ticks) / 10000, digits = 3, nsmall =
0),
     las = 2)
legend("topleft",
       inset = 0.05,
       legend = c("인구", "호수"),
       lty = 1,
       col = c("red", "blue"))
text(x = 1700,
     y = c(500, 100),
     labels = c("인구", "호수"))
````
````

```
main.title <- "조선시대 호수와 인구수의 변화"
x.lab <- "연도"
y.lab <- "호수와 인구수(단위 만)"
title(main = main.title,
      xlab = x.lab,
      ylab = y.lab)
dev.copy(png,
         file = "../pics/chosun_demo.png",
         width = 800,
         height = 450)
dev.off()
```

ggplot

Reshaping

```{r, reshape}
library(ggplot2)
library(reshape2)
source("./theme_kr.R")
chosun.melt <- melt(chosun.df,
                    id.vars = "Years",
                    measure.vars = c("Households", "Population"),
                    variable.name = "Variable",
                    value.name = "Counts")
str(chosun.melt)
```

geom_line, geom_pint, ...

```{r, ggplot, fig.width = 9, fig.height = 5}
g1 <- ggplot(data = chosun.melt,
             mapping = aes(x = Years,
                           y = Counts / 10000,
                           colour = Variable)) +
  geom_line() +
  geom_point(shape = 21,
             fill = "white",
             size = 3,
             show.legend = FALSE)
g1
g2 <- g1 +
  theme_bw() +
  theme.kr
g2
g3 <- g2 +
#  theme(panel.grid.major = element_line(linetype = "dotted", colour = "black")) +
  scale_x_continuous(name = x.lab,
                     breaks = Years.ticks,
                     labels = Years.ticks) +
  theme(axis.text.x = element_text(angle = 90))
g3
g4 <- g3 +
  scale_y_continuous(name = y.lab,
                     breaks = y.breaks,
                     labels = y.labels) +
  theme(axis.text.y = element_text(angle = 0))
g4
g5 <- g4 + scale_colour_manual(name = "구분",
                               values = c("red", "blue"),
                               labels = c("호수", "인구수"))
g5
g6 <- g5 +
  theme(legend.position = c(0.2, 0.8),
        legend.background = element_rect(colour = "black",
                                         linetype = "solid"))
g6
g7 <- g6 +
```

```
  ggtitle(main.title) +
  annotate("text",
           x = 1700,
           y = c(500, 100),
           label = c("인구", "호수"),
           family = "HCR Dotum LVT")
g7
ggsave("../pics/chosun_demo_ggplot.png", width = 9, height = 81/16, units = "in", dpi =
72)
```