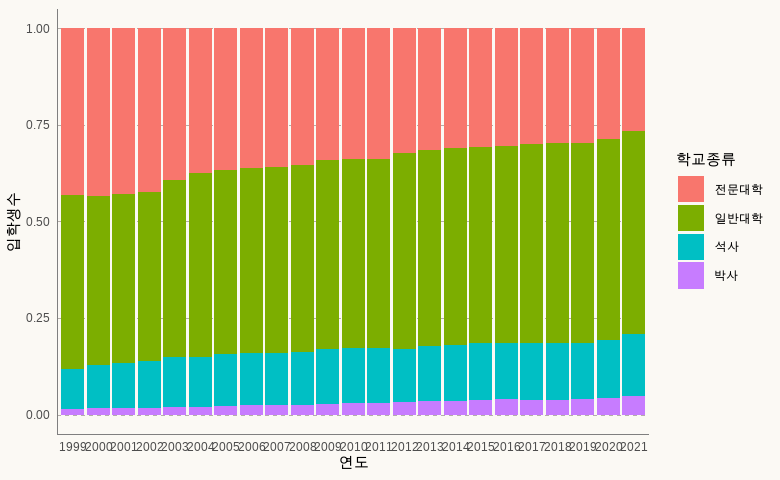
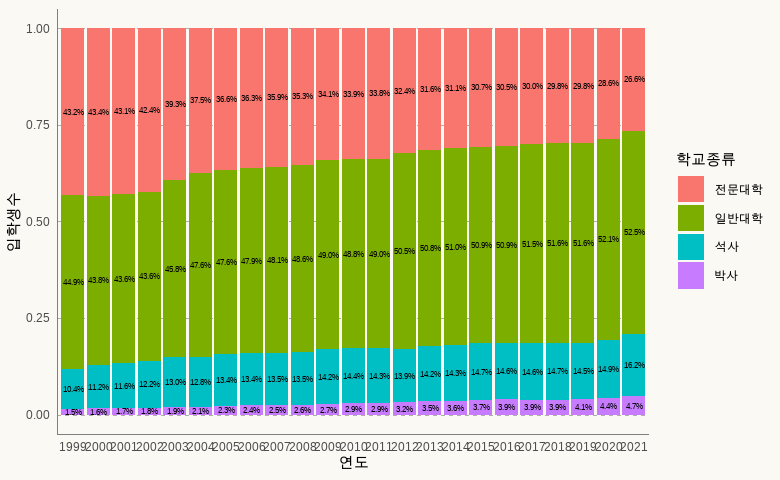
1. 구성(Composition)의 시각화

# 비율 누적 막대 그래프

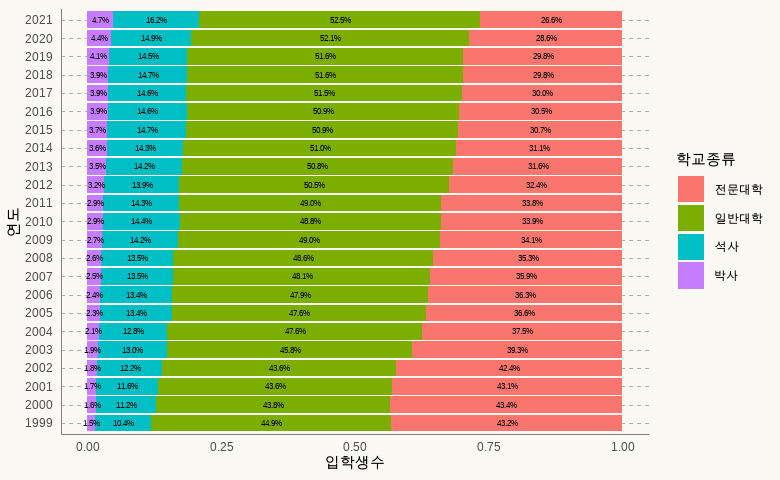
p\_col\_hor <- df\_입학자\_long |>  
 filter(학교종류 %in% c('전문대학', '일반대학', '석사', '박사'), 지역 == '전체') |>  
 mutate(학교종류 = fct\_relevel(학교종류, '전문대학', '일반대학', '석사', '박사')) |>  
 ggplot()  
  
p\_col\_hor1 <- p\_col\_hor +  
 geom\_col(aes(x = 연도, y = 입학생수, fill = 학교종류), position = 'fill')  
  
p\_col\_hor1



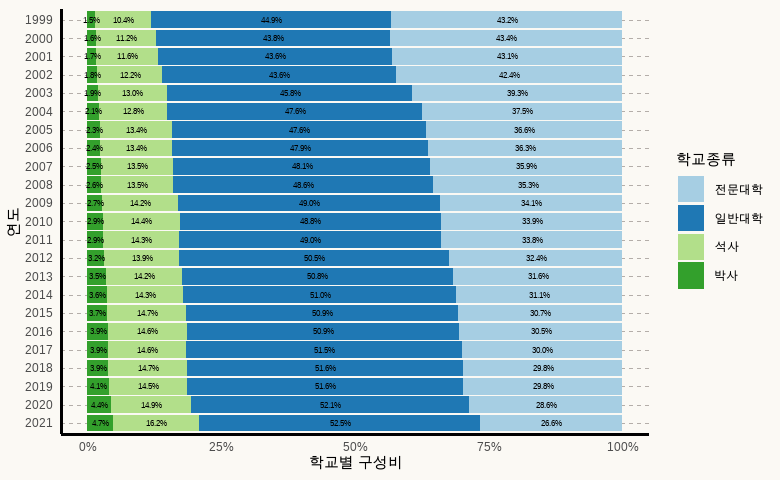
p\_col\_hor2 <- p\_col\_hor1 +   
 geom\_text(data = (df\_입학자\_long |>  
 filter(학교종류 %in% c('전문대학', '일반대학', '석사', '박사'), 지역 == '전체') |>  
 mutate(학교종류 = fct\_relevel(학교종류, '전문대학', '일반대학', '석사', '박사')) |>  
 group\_by(연도) |>  
 mutate(비율 = 입학생수 / sum(입학생수)) |>  
 ungroup()),   
 aes(x = 연도, y = 비율, label = scales::percent(비율, accuracy = 0.1), fill = 학교종류), position = position\_stack(vjust = 0.5), size = 2)  
  
p\_col\_hor2



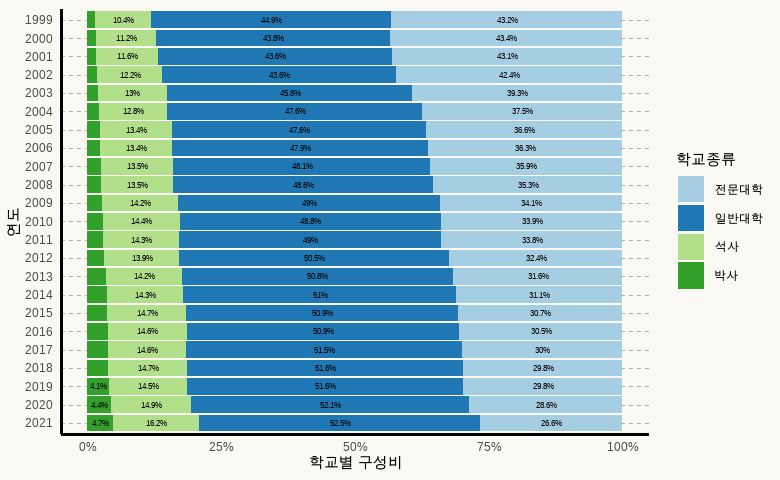
p\_col\_hor3 <- p\_col\_hor2 +   
 coord\_flip()  
  
p\_col\_hor3



p\_col\_hor3 +   
 scale\_y\_continuous(labels = scales::percent\_format(suffix = "%", prefix = "")) +  
 scale\_x\_discrete(limits=rev) +  
 # scale\_y\_discrete(labels = scales::percent\_format()) +  
 labs(y="학교별 구성비") +  
 theme(axis.line = element\_line(size=1, colour = "black"),  
 panel.grid.major = element\_blank(), panel.grid.minor = element\_blank(),  
 panel.border = element\_blank(), panel.background = element\_blank()) + scale\_fill\_brewer(palette="Paired")



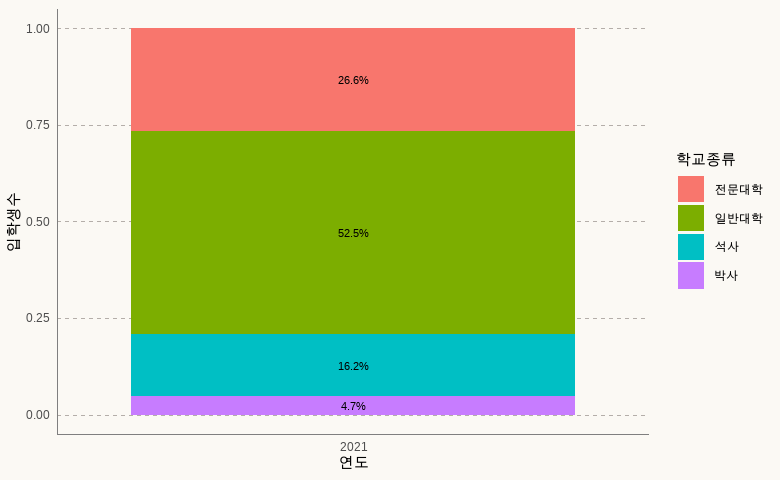
p\_col\_hor1 +   
 geom\_text(data = (df\_입학자\_long |>  
 filter(학교종류 %in% c('전문대학', '일반대학', '석사', '박사'), 지역 == '전체') |>  
 mutate(학교종류 = fct\_relevel(학교종류, '전문대학', '일반대학', '석사', '박사')) |>  
 group\_by(연도) |>  
 mutate(비율 = 입학생수 / sum(입학생수)) |>  
 ungroup()),   
 aes(x = 연도, y = 비율, label = ifelse(비율 > 0.04, paste0(round(비율, 3) \* 100,"%"), ''), fill = 학교종류), position = position\_stack(vjust = 0.5), size = 2) +   
 coord\_flip() +   
 scale\_y\_continuous(labels = scales::percent\_format(suffix = "%", prefix = "")) +  
 scale\_x\_discrete(limits=rev) +  
 # scale\_y\_discrete(labels = scales::percent\_format()) +  
 labs(y="학교별 구성비") +  
 theme(axis.line = element\_line(size=1, colour = "black"),  
 panel.grid.major = element\_blank(), panel.grid.minor = element\_blank(),  
 panel.border = element\_blank(), panel.background = element\_blank()) + scale\_fill\_brewer(palette="Paired")



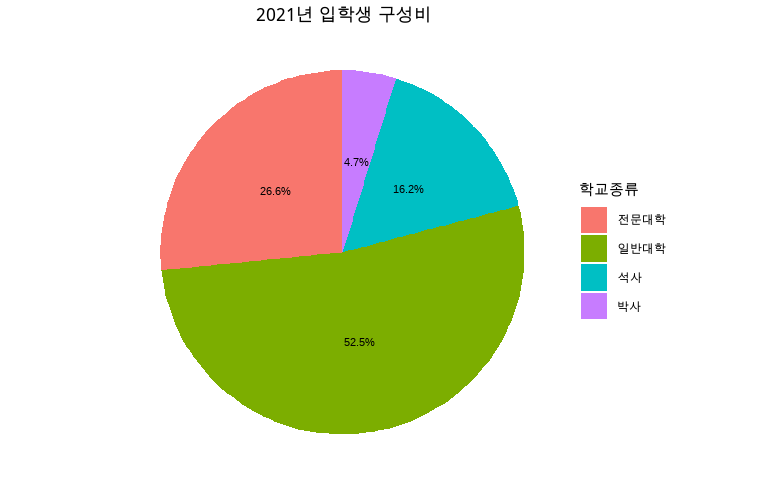
# 파이 차트

## 단일 파이 차트

df\_pie <- df\_입학자\_long |>  
 filter(학교종류 %in% c('전문대학', '일반대학', '석사', '박사'), 지역 == '전체', 연도 == 2021) |>  
 mutate(학교종류 = fct\_relevel(학교종류, '전문대학', '일반대학', '석사', '박사')) |>  
 mutate(비율 = 입학생수 / sum(입학생수))  
  
p\_pie <- df\_pie |>  
 ggplot()  
  
  
p\_pie1 <- p\_pie +  
 geom\_col(aes(x = 연도, y = 입학생수, fill = 학교종류), position = 'fill') +  
 geom\_text(aes(x = 연도, y = 비율, label = scales::percent(비율, accuracy = 0.1), fill = 학교종류), position = position\_stack(vjust = 0.5), size = 3)  
  
p\_pie1

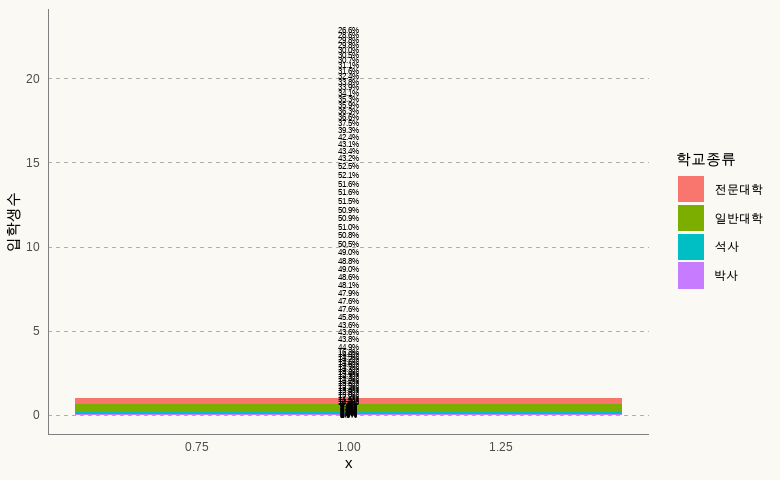


p\_pie1 +  
 coord\_polar(theta = "y") +  
 theme\_void() +  
 theme(plot.title = element\_text(hjust = 0.5)) +  
 labs(title = '2021년 입학생 구성비')

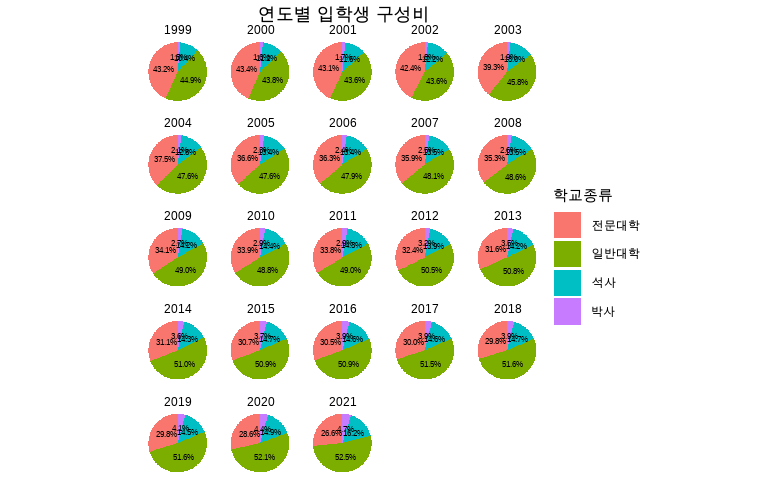


## 분할 파이 차트

df\_pie\_all <- df\_입학자\_long |>  
 filter(학교종류 %in% c('전문대학', '일반대학', '석사', '박사'), 지역 == '전체') |>  
 mutate(학교종류 = fct\_relevel(학교종류, '전문대학', '일반대학', '석사', '박사')) |>   
 group\_by(연도) |>  
 mutate(비율 = 입학생수 / sum(입학생수)) |>  
 ungroup()  
  
  
p\_pie\_all <- df\_pie\_all |>  
 ggplot()  
  
  
p\_pie\_all1 <- p\_pie\_all +  
 geom\_col(aes(x = 1, y = 입학생수, fill = 학교종류), position = 'fill') +  
 geom\_text(aes(x = 1, y = 비율, label = scales::percent(비율, accuracy = 0.1), fill = 학교종류), position = position\_stack(vjust = 0.5), size = 2)  
  
p\_pie\_all1



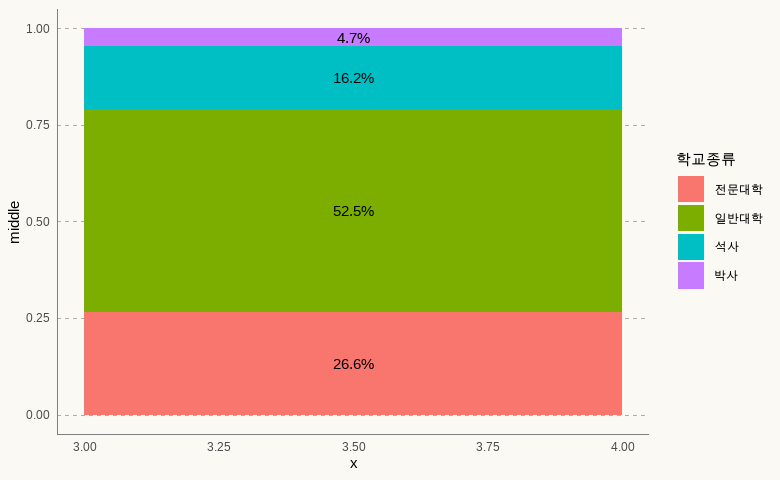
p\_pie\_all1 +  
 facet\_wrap(~연도) +   
 coord\_polar(theta = "y") +  
 theme\_void() +  
 theme(plot.title = element\_text(hjust = 0.5)) +  
 labs(title = '연도별 입학생 구성비')



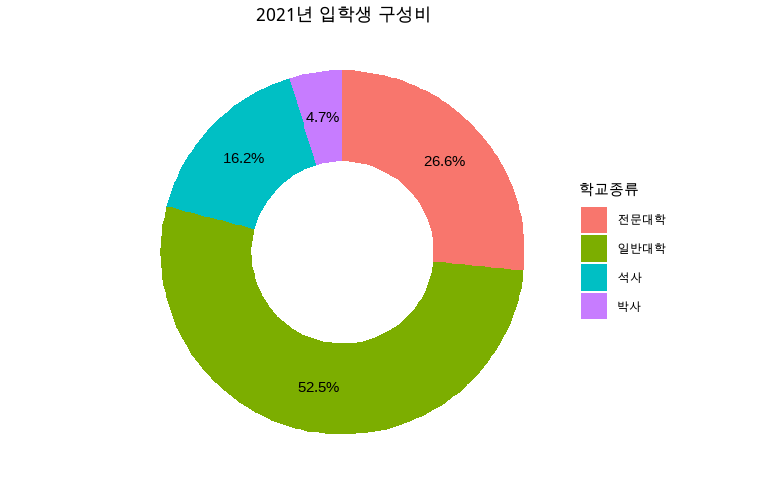
# 도넛 차트

## 단일 도넛 차트

df\_donut <- df\_입학자\_long |>  
 filter(학교종류 %in% c('전문대학', '일반대학', '석사', '박사'), 지역 == '전체', 연도 == 2021) |>  
 mutate(학교종류 = fct\_relevel(학교종류, '전문대학', '일반대학', '석사', '박사')) |>  
 mutate(비율 = round(입학생수 / sum(입학생수), 3))  
  
  
df\_donut$ymax = cumsum(df\_donut$비율)  
  
df\_donut$ymin = lag(df\_donut$ymax, 1, default = 0)  
  
df\_donut$middle = (df\_donut$ymin + df\_donut$ymax) / 2   
  
p\_donut <- df\_donut |>  
 ggplot()  
  
p\_donut1 <- p\_donut +  
 geom\_rect(aes(xmin = 3, xmax = 4, ymin = ymin, ymax = ymax, fill = 학교종류)) +   
 geom\_text(aes(x = 3.5, y = middle, label = scales::percent(비율, accuracy = 0.1)))  
  
p\_donut1

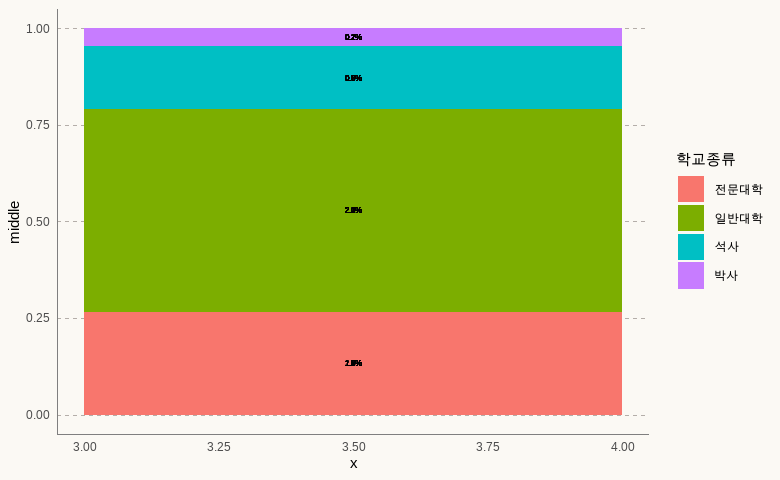


p\_donut2 <- p\_donut1 +  
 coord\_polar(theta = "y") +  
 lims(x = c(2, 4)) +  
 theme\_void() +  
 theme(plot.title = element\_text(hjust = 0.5)) +  
 labs(title = '2021년 입학생 구성비')  
  
p\_donut2

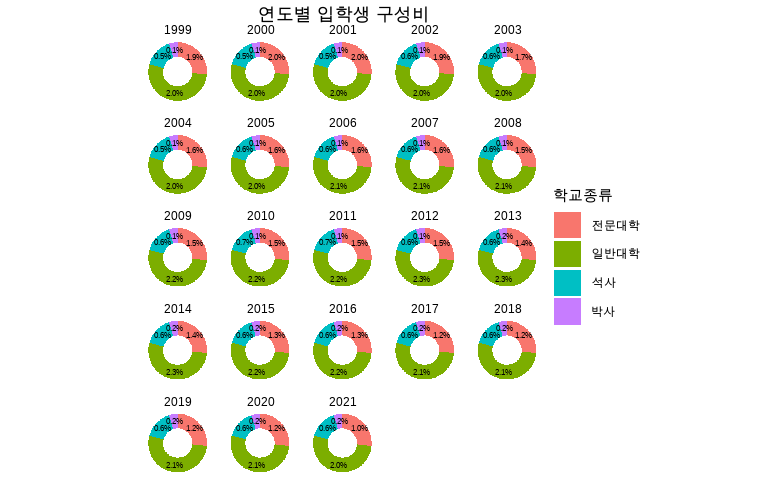


## 분할 도넛 차트

df\_donut\_all <- df\_입학자\_long |>  
 filter(학교종류 %in% c('전문대학', '일반대학', '석사', '박사'), 지역 == '전체') |>  
 mutate(학교종류 = fct\_relevel(학교종류, '전문대학', '일반대학', '석사', '박사')) |>   
 group\_by(연도) |>  
 mutate(비율 = 입학생수 / sum(입학생수), ymax = cumsum(df\_donut$비율), ymin = lag(df\_donut$ymax, 1, default = 0), middle = (df\_donut$ymin + df\_donut$ymax) / 2) |>  
 ungroup() |>  
 mutate(비율 = round(입학생수 / sum(입학생수), 3))  
  
p\_donut\_all <- df\_donut\_all |>  
 ggplot()  
  
p\_donut\_all1 <- p\_donut\_all +  
 geom\_rect(aes(xmin = 3, xmax = 4, ymin = ymin, ymax = ymax, fill = 학교종류)) +   
 geom\_text(aes(x = 3.5, y = middle, label = scales::percent(비율, accuracy = 0.1)), size = 2)  
  
  
p\_donut\_all1



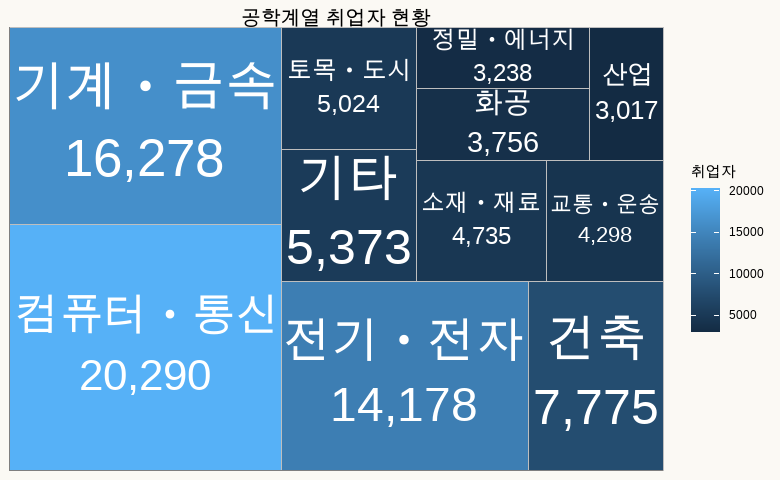
p\_donut\_all1 +  
 facet\_wrap(~연도) +   
 lims(x = c(2, 4)) +  
 coord\_polar(theta = "y") +  
 theme\_void() +  
 theme(plot.title = element\_text(hjust = 0.5)) +  
 labs(title = '연도별 입학생 구성비')



# 트리맵

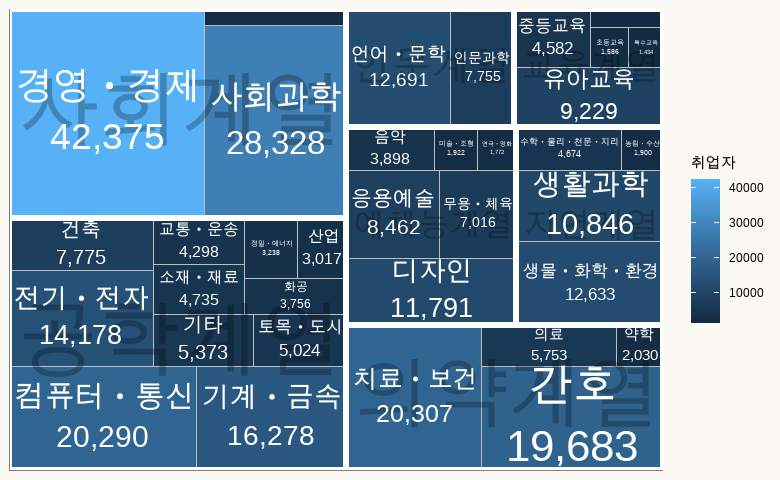
## 단일 그룹 트리맵

if(!require(treemapify)) {  
 install.packages('treemapify')  
 library(treemapify)  
}  
  
df\_treemap <- df\_취업통계 |> filter(대계열 == '공학계열') |> group\_by(중계열) |>  
 summarise(취업자 = sum(취업자\_합계\_계))  
  
df\_treemap |> ggplot(aes(area = 취업자, fill = 취업자, label = paste0(중계열, "\n", scales::comma(취업자)))) +  
 geom\_treemap() +  
 geom\_treemap\_text(colour = "white",  
 place = "centre",  
 size = 10, grow = TRUE) +  
 labs(title = '공학계열 취업자 현황') +  
 theme(plot.title = element\_text(hjust = 0.5, size = 15))



## 다중 그룹 트리맵

df\_treemap\_multi <- df\_취업통계 |> group\_by(대계열, 중계열) |>  
 summarise(취업자 = sum(취업자\_합계\_계))  
  
df\_treemap\_multi |> ggplot(aes(area = 취업자, fill = 취업자, label = paste0(중계열, "\n", scales::comma(취업자)), subgroup = 대계열)) +  
 geom\_treemap() +   
 geom\_treemap\_subgroup\_border(colour = "white", size = 5) +  
 geom\_treemap\_subgroup\_text(place = "centre", grow = TRUE,  
 alpha = 0.25, colour = "black") +  
 geom\_treemap\_text(colour = "white", place = "centre",  
 size = 10, grow = TRUE)



labs(title = '공학계열 취업자 현황') +  
 theme(plot.title = element\_text(hjust = 0.5, size = 15))

## NULL

# 와플차트

var <- df\_취업통계 |> filter(대계열 == '공학계열') |> select(중계열) |> pull() # the categorical data   
  
nrows <- 20  
  
df\_waffle <- expand.grid(y = 1:nrows, x = 1:nrows)  
  
categ\_table <- round(table(var) \* ((nrows\*nrows)/(length(var))))  
  
df\_waffle$category <- factor(rep(names(categ\_table), categ\_table))  
  
ggplot(df\_waffle, aes(x = x, y = y, fill = category)) +   
 geom\_tile(color = "black", size = 0.5) +  
 theme\_void() +  
 labs(title="공학계열 중계열 학과수 Waffle Chart", fill = '중계열') +  
 scale\_fill\_brewer(palette = "Set3")

