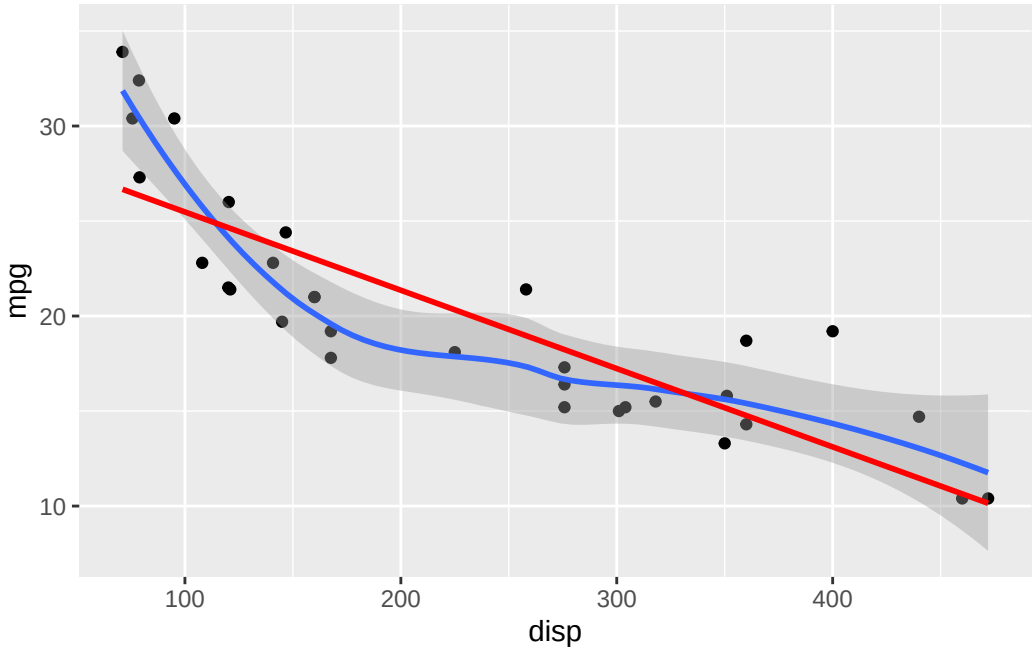
ggplot

Intro ggplot

```
ggplot(
  data = mtcars,
  mapping = aes(x = disp, y = mpg)
  ) +
  geom_point() +
  geom_smooth(level = 0.99) +
  geom_smooth(method = "lm",
              colour = "red",
              se = FALSE)
```

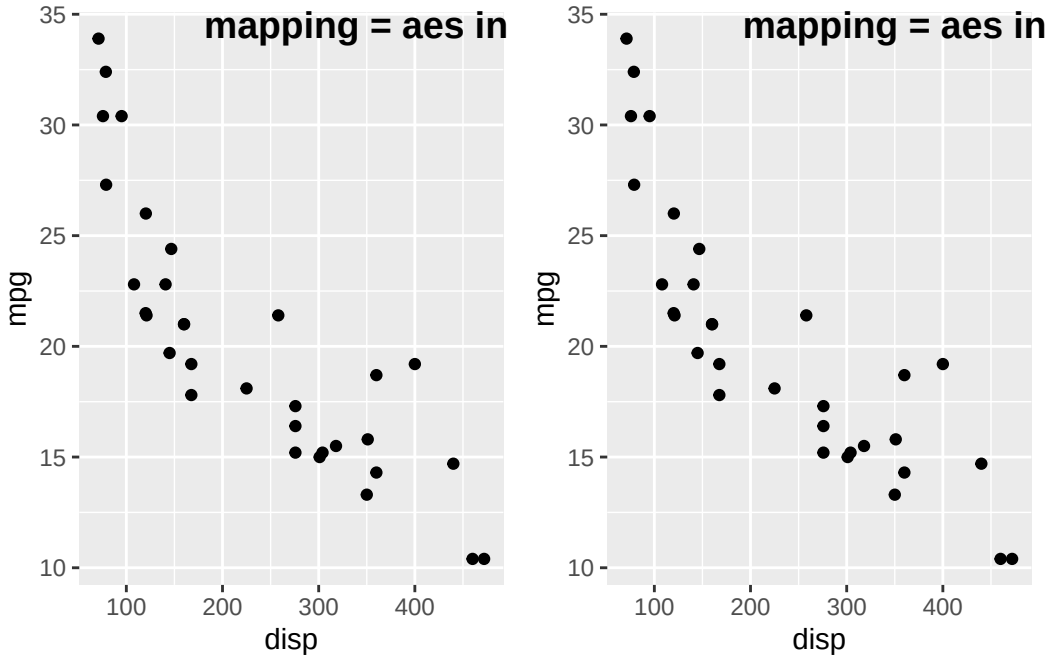
```
`geom_smooth()` using method = 'loess' and formula = 'y ~ x'
`geom_smooth()` using formula = 'y ~ x'
```



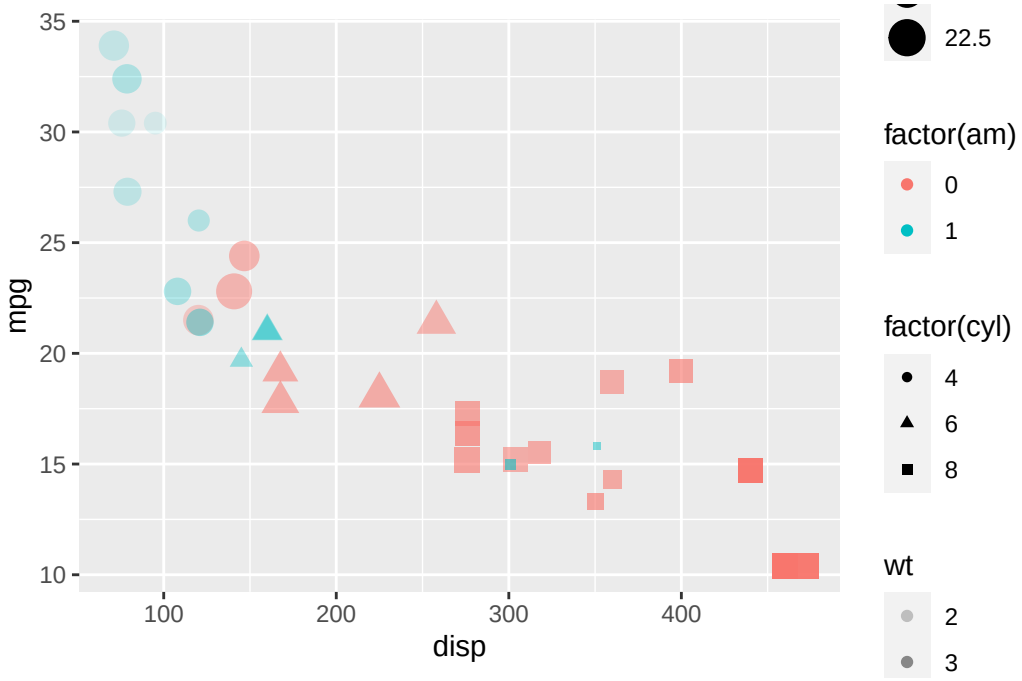

```
gg1 <-   ggplot(data = mtcars, mapping = aes(x = disp, y = mpg)) +
  geom_point()
```

```
gg2 <-   ggplot(data = mtcars) +
  geom_point(mapping = aes(x = disp, y = mpg))
```

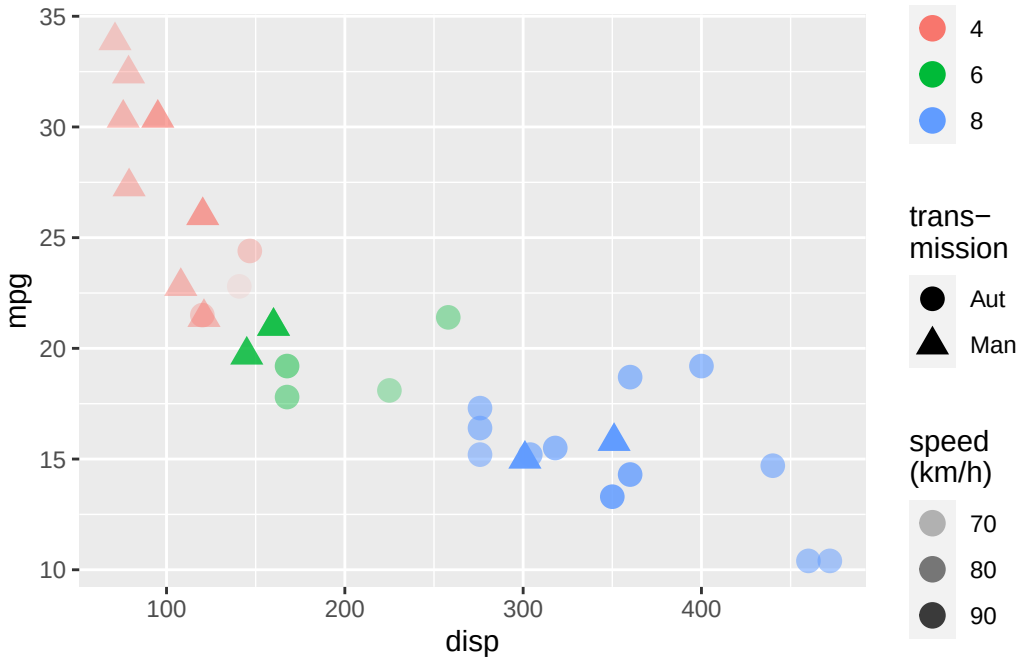
```
ggarrange(gg1, gg2,
          labels = c(
            "mapping = aes in ggplot",
            "mapping = aes in geom_*"
            ),
          nrow = 1)
```




```
ggplot() +
  geom_point(
    mapping = aes(x = disp, y = mpg,
                  shape = factor(cyl),
                  colour = factor(am),
                  size = qsec,
                  alpha = wt
                  ),
    data = mtcars
  )
```



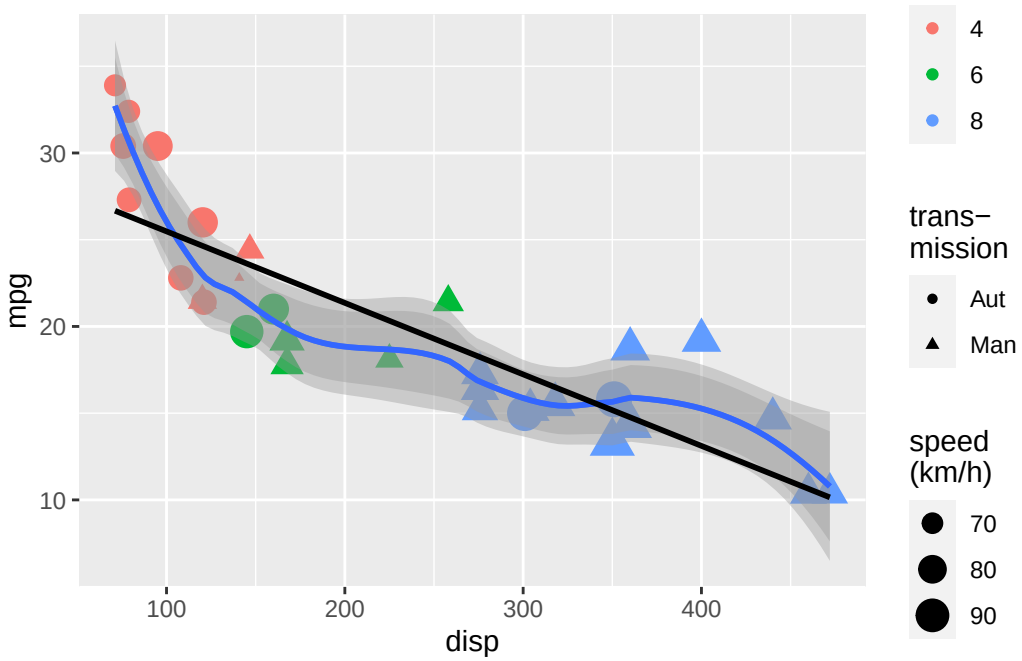

```
ggplot() +
  geom_point(
            data = mtcars,
             mapping = aes(
               x = disp,
               y = mpg,
               colour = factor(cyl),
               alpha = 3.6*(0.25*1609.347)/qsec,
               shape = factor(ifelse(am, "Man", "Aut"))
               ),
            size = 4
             ) +
    labs(
      colour = "cyl",
      alpha = "speed\n(km/h)",
      shape = "trans-\nmission"
      )
```




```
ggplot() +
  geom_point(
    data = mtcars,
    mapping = aes(
      x = disp,
      y = mpg,
      colour = factor(cyl),
      size = 3.6*(0.25*1609.347)/qsec,
      shape = factor(
        # Note codeing am
        # 0 automatic, 1 manual
        ifelse(
          am,
          "Aut",
          "Man"
          )
        )
      )
    ) +
  labs(
    colour = "cyl",
```

```
    size = "speed\n(km/h)",
    shape = "trans-\nmission"
    ) +
  geom_smooth(
    data = mtcars,
    mapping = aes(x = disp, y = mpg),
    span = 0.5,
    level = 0.99
    ) +
  geom_smooth(
    data = mtcars,
    mapping = aes(x = disp, y = mpg),
    span = 0.5,
    level = 0.95
    ) +
  geom_smooth(
    data = mtcars,
    mapping = aes(x = disp, y = mpg),
    method = lm,
    colour = "black",
    se = FALSE
  )
```

```
`geom_smooth()` using method = 'loess' and formula = 'y ~ x'
`geom_smooth()` using method = 'loess' and formula = 'y ~ x'
`geom_smooth()` using formula = 'y ~ x'
```

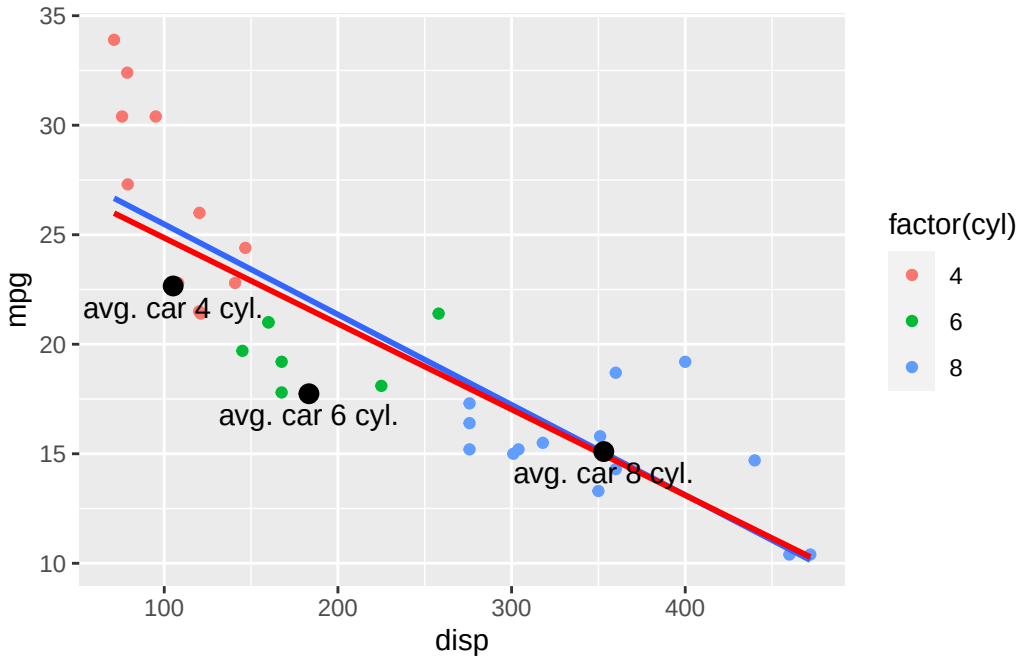



```
## create tibble from scratch
df_mean <-   tibble(
  cyl = c("avg. car 4 cyl.", "avg. car 6 cyl.", "avg. car 8 cyl."),
  mpg = c(22.66, 17.74, 15.10),
  disp = c(105.14, 183.31, 353.10)
  )
```

```
ggplot(
  data = mtcars,
  mapping = aes(x = disp, y = mpg)
  ) +
  geom_point(
    mapping = aes(colour = factor(cyl))
    ) +
  geom_smooth(
    method = "lm",
    se = FALSE
    ) +
  geom_smooth(
    method = MASS::rlm,
    colour = 'Red',
```

```
    se = FALSE
    ) +
  geom_point(
    data = df_mean,
    mapping = aes(x = disp, y = mpg),
    colour = "black",
    size = 3
    ) +
  geom_text(
    data = df_mean,
    mapping = aes(x = disp, y = mpg, label = cyl),
    colour = "black",
    vjust = 1.5
    )
```

```
`geom_smooth()` using formula = 'y ~ x'
`geom_smooth()` using formula = 'y ~ x'
```




```
p_common <- ggplot(
  data = mtcars,
```

```
  mapping = aes(x = disp, y = mpg)
  ) +
  geom_point(
    aes(colour = factor(cyl))
    ) +
  geom_smooth(
    method = "lm",
    se = FALSE
    ) +
  geom_smooth(
    method = MASS::rlm,
    colour = 'Red',
    se = FALSE
    ) +
  geom_point(
    data = df_mean,
    mapping = aes(x = disp, y = mpg),
    colour = "black",
    size = 3
    ) +
  labs(colour = "cyl") +
  theme(legend.position = "bottom")
```

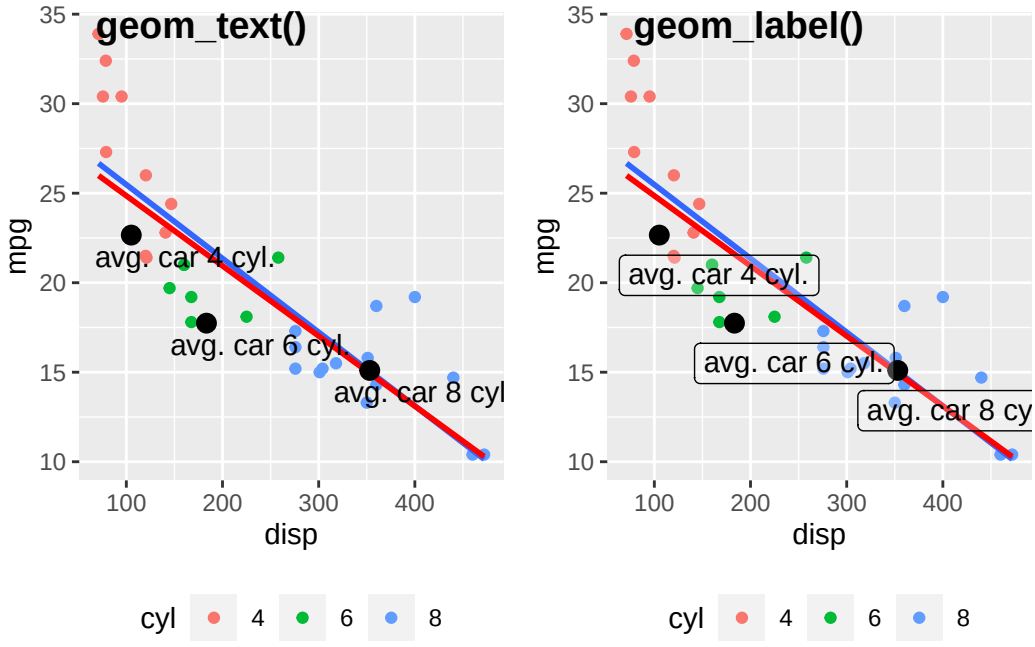
```
# update a ggplot object

# add text labels by geom_text
p1 <- p_common +
  geom_text(
    data = df_mean,
    mapping = aes(x = disp, y = mpg, label = cyl),
    colour = "black",
    vjust = 1.5,
    hjust = 0.2
    )
# add text labels by geom_label
p2 <-   p_common +
  geom_label(
    data = df_mean,
    mapping = aes(x = disp, y = mpg, label = cyl),
    colour = "black",
    vjust = 1.5,
```

```
    hjust = 0.2,
    alpha = 0.25
    ) +
  theme(legend.position = "bottom") +
  labs(colour = "cyl")
```

```
# ggpubr makes it easy to place
# two objects side by side
ggarrange(
  p1,
  p2,
  ncol = 2,
  nrow = 1,
  labels = c(
    "geom_text()",
    "geom_label()"
    )
  )
```

```
`geom_smooth()` using formula = 'y ~ x'
`geom_smooth()` using formula = 'y ~ x'
`geom_smooth()` using formula = 'y ~ x'
`geom_smooth()` using formula = 'y ~ x'
```

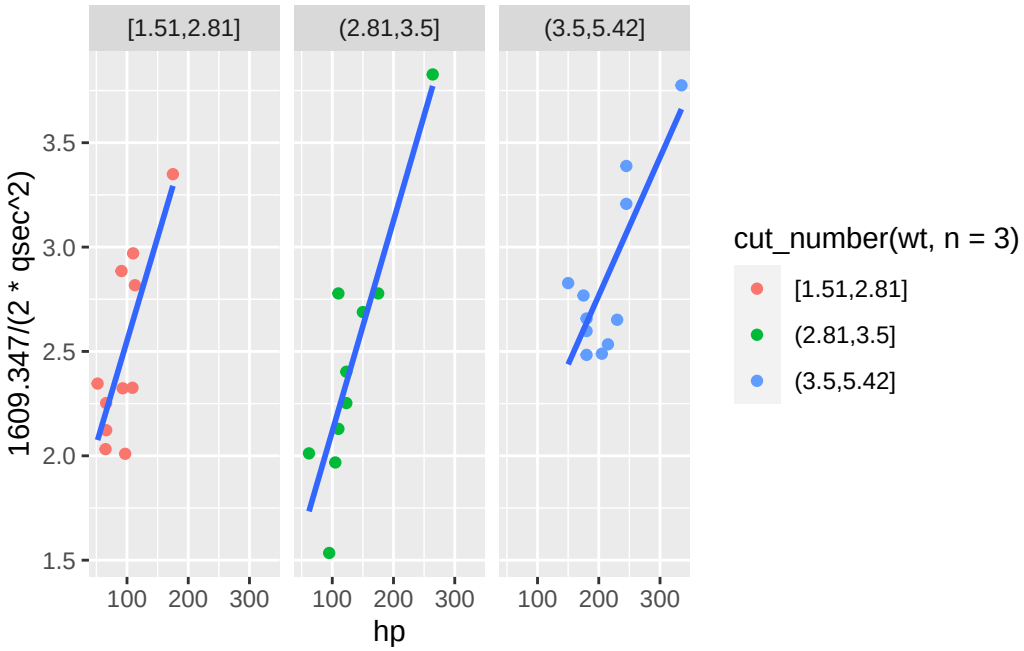



```
cp1 <-   ggplot() +
  geom_point(
    data = mtcars,
    mapping = aes(
      x = hp,
      y = wt,
      colour = 1609.347/(2*qsec^2)
      ),
    size = 4) +
  geom_text(
    data = mtcars,
    mapping = aes(x = hp, y = wt, label = rownames(mtcars)),
    colour = "black",
    size = 2,
    hjust = 0.7,
    vjust = 3
    ) +
  labs(
    size = "Average\nacceleration",
    colour = "Average\nacceleration"
    ) +
```

```
  geom_smooth(
    data = mtcars,
    mapping = aes(x = hp, y = wt),
    method = "lm",
    se = FALSE
    ) +
  theme_classic()
#  scale_size_continuous(range = c(3, 12),
#  breaks = seq(1, 5, by=0.25)) +
```

```
ggplot(
  data = mtcars,
  mapping = aes(
    x = hp,
    y = 1609.347/(2*qsec^2)
    )
  ) +
  facet_wrap(~cut_number(wt, n =3)) +
  geom_point(
    aes(colour = cut_number(
      wt,
      n = 3)
      )
    ) +
  geom_smooth(
    method = "lm",
    se = FALSE
    )
```

```
`geom_smooth()` using formula = 'y ~ x'
```



PxWebApiData

```
# metadata_13891_no <- ApiData(
 # "https://data.ssb.no/api/v0/no/table/13891/",
  #returnMetaFrames = TRUE
#)
```

```
# metadata_13891_no$Kjonn
```

```
#unemp99to02 <- ApiData(
  #"http://data.ssb.no/api/v0/en/table/10540",
  # Have not been able to specify more complex regions
 # Region = list("11*"),
 # Tid = c(paste(
  #  rep(1999:2002, each = 12),
  #  "M",
  #  sprintf("%02d", 1:12),
  #  sep = "")
 #   )
 # )
```

```r
# metadata_10540_no$Tid
```

```r
paste(
  rep(1999:2002, each = 12),
  "M",
  sprintf("%02d", 1:12),
  sep = ""
)
```

```
 [1] "1999M01" "1999M02" "1999M03" "1999M04" "1999M05" "1999M06" "1999M07"
 [8] "1999M08" "1999M09" "1999M10" "1999M11" "1999M12" "2000M01" "2000M02"
[15] "2000M03" "2000M04" "2000M05" "2000M06" "2000M07" "2000M08" "2000M09"
[22] "2000M10" "2000M11" "2000M12" "2001M01" "2001M02" "2001M03" "2001M04"
[29] "2001M05" "2001M06" "2001M07" "2001M08" "2001M09" "2001M10" "2001M11"
[36] "2001M12" "2002M01" "2002M02" "2002M03" "2002M04" "2002M05" "2002M06"
[43] "2002M07" "2002M08" "2002M09" "2002M10" "2002M11" "2002M12"
```