Case Study 08: One Script, Many Products

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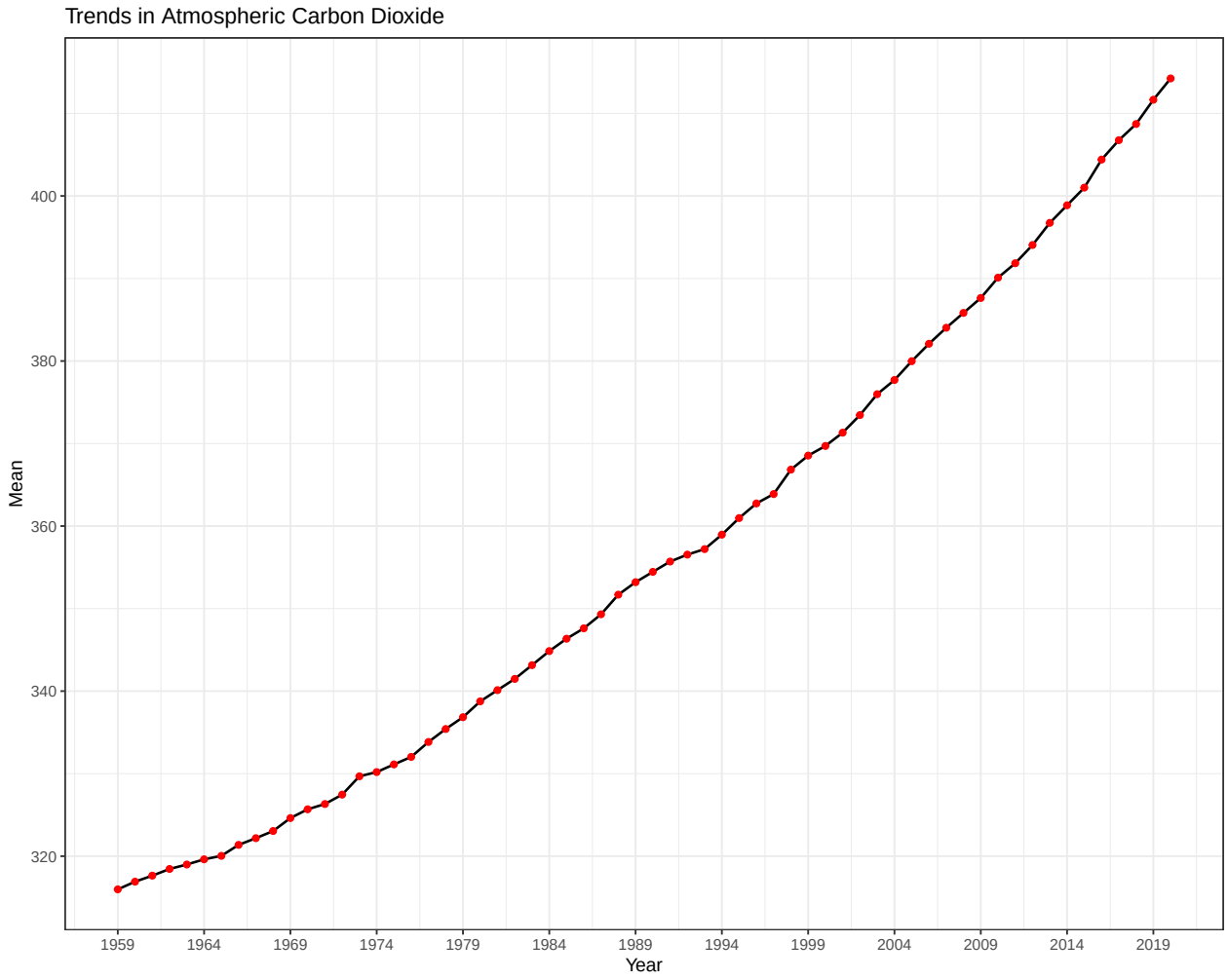
Load data

```
url <- "ftp://aftp.cmdl.noaa.gov/products/trends/co2/co2_annmean_mlo.txt"
df <- read.table(url, col.names = c("year", "mean", "unc"))
```

Visualize

```
#Use ggplot to plot a time series of CO2 levels through time
min_year <- df$year %>% min()
max_year <- df$year %>% max()
df %>%
  mutate(sd = sd(mean)) %>%
  as_tibble() %>%
  ggplot(., aes(x = year, y = mean)) +
  geom_line(color = "black", lwd = 0.7) +
  # geom_errorbar(aes(ymin = mean-sd, ymax = mean+sd),
                # width = 0.4) +
  geom_point(size = 1.5, color = "red") +
  scale_x_continuous(breaks = seq(min_year, max_year, 5)) +
  theme_bw() +
  labs(x = "Year", y = "Mean", title= "Trends in Atmospheric Carbon Dioxide")
```



Creat table

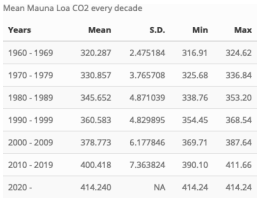
Method 1

```
# statistical summary
summ <- df %>%
  slice(-1) %>%
  mutate(Years = case_when(
    year %in% seq(1960, 1969) ~ "1960 - 1969",
    year %in% seq(1970, 1979) ~ "1970 - 1979",
    year %in% seq(1980, 1989) ~ "1980 - 1989",
    year %in% seq(1990, 1999) ~ "1990 - 1999",
    year %in% seq(2000, 2009) ~ "2000 - 2009",
    year %in% seq(2010, 2019) ~ "2010 - 2019",
    year %in% seq(2020, 2029) ~ "2020 -  "
  )) %>%
  group_by(Years) %>%
  dplyr::summarise(Mean = mean(mean),
                   S.D. = sd(mean),
                   Min = min(mean),
                   Max = max(mean))
```

```
# suitable for github doc output
knitr::kable(summ)
```

Years	Mean	S.D.	Min	Max
1960 - 1969	320.287	2.475184	316.91	324.62
1970 - 1979	330.857	3.765708	325.68	336.84
1980 - 1989	345.652	4.871039	338.76	353.20
1990 - 1999	360.583	4.829895	354.45	368.54
2000 - 2009	378.773	6.177846	369.71	387.64
2010 - 2019	400.418	7.363824	390.10	411.66
2020 -	414.240	NA	414.24	414.24

```
# suitable for html output
kbl(summ,
  caption = "Mean Mauna Loa CO2 every decade",
  format = "html", table.attr = "style='width:40%;'") %>%
  kableExtra::kable_styling(bootstrap_options = "striped",
  position = "float_right") %>%
  as_image(width = 10, file = "table.png")
```


Mean Mauna Loa CO2 every decade

Years	Mean	S.D.	Min	Max
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2020 -	414.240	NA	414.24	414.24

Method 2

```
# suitable for html output
DT::datatable(summ,
                caption = 'Mean Mauna Loa CO2 every decade',
                rownames = F,
                filter = 'top')
```

Show 10 entries Search:

Mean Mauna Loa CO2 every decade

Years	Mean	S.D.	Min	Max
All	All	All	All	All
1960 - 1969	320.287	2.47518371933165	316.91	324.62
1970 - 1979	330.857	3.76570799009518	325.68	336.84
1980 - 1989	345.652	4.87103867545494	338.76	353.2
1990 - 1999	360.583	4.82989544400291	354.45	368.54
2000 - 2009	378.773	6.17784581297469	369.71	387.64
2010 - 2019	400.418	7.36382418765323	390.1	411.66
2020 -	414.24		414.24	414.24

Showing 1 to 7 of 7 entries Previous 1 Next

Render output files

```
rmarkdown::render("week_08/case_study_08.Rmd",output_format = "all")
```