Homework 10

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Answers:

Task 1:

```r
library(pacman)
p_load(classicecon, tidyverse, ggplot2, ggthemes)

df <- ak91 |>
  group_by(birthyear, quarter_birth) |>
  summarise(mean_educ = mean(education), .groups = "drop") |>
  arrange(birthyear, quarter_birth) |>
  mutate(label = as.character(quarter_birth)) |>
  mutate(birthyear2 = birthyear - 1900) |>
  mutate(x_axis = birthyear2 + (quarter_birth) / 4)

ggplot(df, aes(x = x_axis, y = mean_educ)) +
  geom_line() +
  geom_point(shape = 15, size = 3) +
  geom_text(aes(label = label), vjust = 2.5, size = 3) +
  scale_x_continuous(
    limits = c(30, 40),
    breaks = seq(30, 40, by = 2)) +
  scale_y_continuous(
    limits = c(12.2, 13.2),
    breaks = seq(12.2, 13.2, by = 0.2)) +
  labs(
    x = "Year of Birth",
    y = "Years of Completed Education",
    caption = "Figure I\nYears of Education and Season of Birth\n1980 Census\nNote: Quarter of birth is listed bel
  ) +
  theme_tufte() +
  theme(
    panel.border = element_rect(color = "black", fill = NA, linewidth = 1),
    plot.caption = element_text(hjust = 0.5, size = 8),
    axis.title.x = element_text(size = 11, face = "bold"),
    axis.title.y = element_text(size = 11, face = "bold")
```

```
  )
```

```
Warning: Removed 80 rows containing missing values or values outside the scale range
(`geom_line()`).
```

```
Warning: Removed 80 rows containing missing values or values outside the scale range
(`geom_point()`).
```

```
Warning: Removed 80 rows containing missing values or values outside the scale range
(`geom_text()`).
```

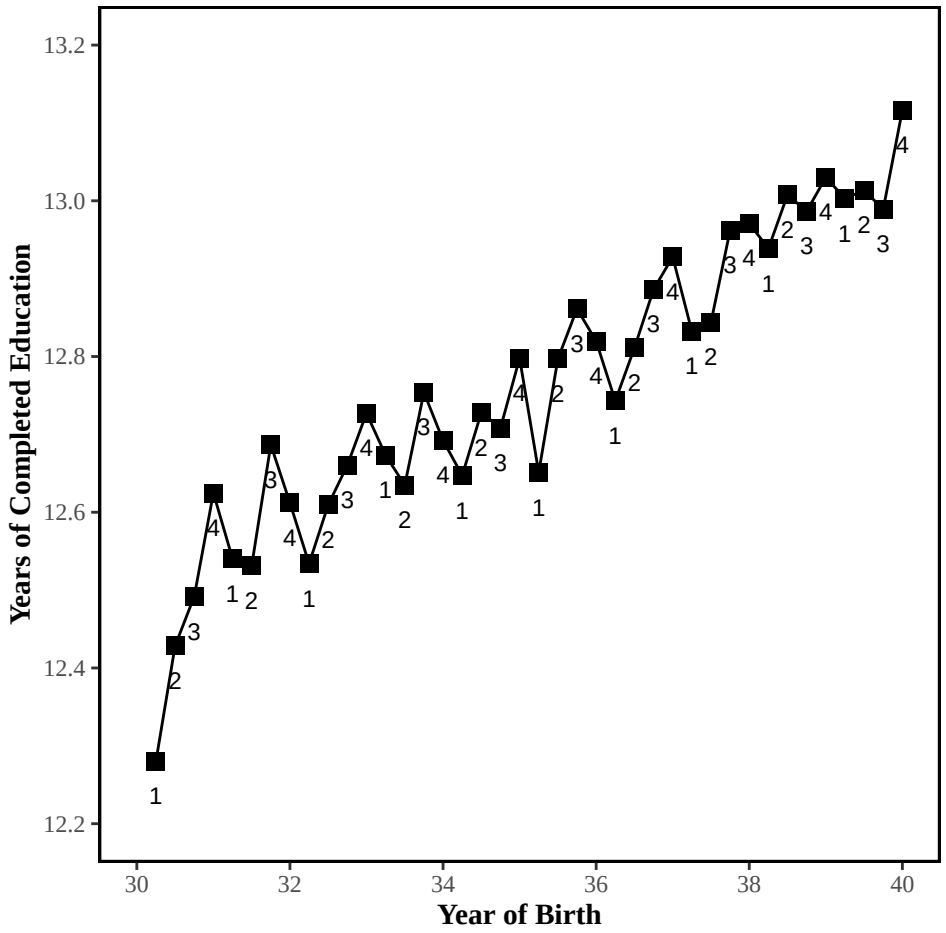

Figure I
Years of Education and Season of Birth
1980 Census
Note: Quarter of birth is listed below each observation.

Task 2: **Clarification:** I have written the codes, however, there is something wrong with rendering, the gt table looks different from what it should be in the R studio. I asked the Professor and he suggests to read the png file back to the file. Therefore, I used the `knitr::include_graphics` to embed the graph to the pdf file.

```
library(pacman)
p_load(gt, palmerpenguins, knitr)

penguins2 <- penguins |>
  filter(sex %in% c("male", "female")) |>
  group_by(sex, species) |>
  summarise(
    `Body Mass (g)` = round(mean(body_mass_g, na.rm = TRUE)),
    `Flipper Length (mm)` = round(mean(flipper_length_mm, na.rm = TRUE)),
    `Bill Length (mm)` = round(mean(bill_length_mm, na.rm = TRUE), 2),
    `Bill Depth (mm)` = round(mean(bill_depth_mm, na.rm = TRUE), 2),
    .groups = "drop"
  ) |>
  mutate(sex = ifelse(sex == "female", "Female", "Male")) |>
  mutate(species = factor(species, levels = c("Adelie", "Chinstrap", "Gentoo")))

  penguins2 |>
  arrange(sex, species) |>
  gt(groupname_col = "sex", rowname_col = "species") |>
  tab_header(
    title = md("**Palmer penguin allometry by species and sex**")
  ) |>
  tab_style(
  style = cell_text(align = "left"),
  locations = cells_title(groups = "title")
  ) |>
  cols_label(
    `Body Mass (g)` = md("BODY MASS (G)"),
    `Flipper Length (mm)` = md("FLIPPER LENGTH (MM)"),
    `Bill Length (mm)` = md("BILL LENGTH (MM)"),
    `Bill Depth (mm)` = md("BILL DEPTH (MM)")
  ) |>
  tab_source_note(
    source_note = md("Note: Data were collected at Palmer Archipelago, Antarctica 2007 - 2009
  ) |>
  opt_table_lines(extent = "none") |>
  cols_align(align = "center", columns = everything()) |>
tab_style(
```

```
  style = cell_borders(
    sides = "top",
    color = "black",
    weight = px(3)
  ),
  locations = cells_row_groups(groups = "Female")
) |>
tab_style(
  style = cell_borders(
    sides = "bottom",
    color = "gray80",
    weight = px(3)
  ),
  locations = cells_row_groups(groups = "Female")
) |>
tab_style(
  style = cell_borders(
    sides = "top",
    color = "gray90",
    weight = px(1)
  ),
  locations = list(
  cells_stub(rows = 2),
  cells_body(rows = 2))
) |>
tab_style(
  style = cell_borders(
    sides = "top",
    color = "gray90",
    weight = px(1)
  ),
  locations = list(
  cells_stub(rows = 3),
  cells_body(rows = 3))
) |>
tab_style(
  style = cell_borders(
    sides = "bottom",
    color = "gray80",
    weight = px(3)
  ),
  locations = cells_row_groups(groups = "Male")
```

```
) |>
tab_style(
  style = cell_borders(
    sides = "top",
    color = "gray90",
    weight = px(1)
  ),
  locations = list(
  cells_stub(rows = 5),
  cells_body(rows = 5))
) |>
tab_style(
  style = cell_borders(
    sides = "top",
    color = "gray90",
    weight = px(1)
  ),
  locations = list(
  cells_stub(rows = 6),
  cells_body(rows = 6))
) |>
tab_style(
  style = cell_borders(
    sides = "top",
    color = "gray80",
    weight = px(3)
  ),
  locations = cells_source_notes()
)
```

```
include_graphics("/Users/edisonkung/Desktop/R for empirical research/HW/my_table.png")
```

Palmer penguin allometry by species and sex

	BODY MASS (G)	FLIPPER LENGTH (MM)	BILL LENGTH (MM)	BILL DEPTH (
Female				
Adelie	3369	188	37.26	17.62
Chinstrap	3527	192	46.57	17.59
Gentoo	4680	213	45.56	14.24
Male				
Adelie	4043	192	40.39	19.07
Chinstrap	3939	200	51.09	19.25
Gentoo	5485	222	49.47	15.72

Note: Data were collected at Palmer Archipelago, Antarctica 2007 - 2009.

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