Quarto and gt tables to PDF

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1 Penguin Anatomy Over Time and Islands: a demo of Quarto, `gt`, and `gtExtras`

Quarto® Quarto is an open-source scientific and technical publishing system built on Pandoc.

gt With the gt package, anyone can make wonderful-looking tables using the R programming language. The gt philosophy: we can construct a wide variety of useful tables with a cohesive set of table parts. These include the table header, the stub, the column labels and spanner column labels, the table body, and the table footer.

gtExtras The goal of gtExtras is to provide some additional helper functions to assist in creating beautiful tables with gt.

1.1 Load packages and prep data

```
library(tidyverse)
library(palmerpenguins)
library(gt)
library(gtExtras)

# make a table of our data
# but let's summarize by year, so first make a year column
dat <- penguins %>%
  dplyr::arrange(year) %>%
  mutate(year = as.factor(year)) %>%
  group_by(species, island, year) %>% # order here will influence table output
  summarise(across(bill_length_mm:body_mass_g, ~ mean(., na.rm = TRUE))) %>%
  select(species, island, year, everything()) %>%
  dplyr::arrange(species, island, year) %>%
  ungroup() # experiment with and without
```

1.2 Build the table, include some gtExtras functions for colors

gt's default is to produce an html table, whose html elements will not render in PDF.

```
# table using gt package
pt <- dat %>%
  dplyr::group_by(species) %>% # add a grouping variable and drop stub info
  #gt(rowname_col = "species") %>%
  #tab_stubhead(label = "species") %>%
  gt() %>%
  tab_header(
    title = md("**Penguin Anatomical Changes**"),
    subtitle = "By species, island, and year from 2007-2009"
  ) %>%
  tab_spanner( # tab spanner!
    label = "mean anatomy measures in mm",
    columns = c(bill_length_mm:flipper_length_mm)
  ) %>%
  fmt_number(
    columns = bill_length_mm:body_mass_g,
    decimals = 1
  ) %>%
```

```
  tab_source_note(
    source_note = "Source: Very cold nights."
  ) %>%
  tab_source_note(
    # hitting return to start new lines so the string will stay inside the PDF
    # but it will be a continuous string when it renders as the footnote
    source_note = md("Reference: Horst AM, Hill AP, Gorman KB (2020).
    palmerpenguins: Palmer Archipelago (Antarctica) penguin data. R package
    version 0.1.0. https://allisonhorst.github.io/palmerpenguins/")
  ) %>%
  tab_footnote(
    footnote = "Only found on a single island.",
    locations = cells_row_groups(groups = c("Chinstrap", "Gentoo"))
  ) %>%
  # trim gives smaller range of colors
  # so the green and purples are not as dark
  gt_hulk_col_numeric(bill_length_mm, trim = TRUE) %>%  # gtExtras!
  gt_hulk_col_numeric(bill_depth_mm, trim = TRUE) %>%  # gtExtras!
  gt_hulk_col_numeric(flipper_length_mm, trim = TRUE) %>%  # gtExtras!
  cols_label( # new column labels!
    bill_length_mm = md("**Bill Length**"), # wrapped in md() for markdown
    bill_depth_mm = md("**Bill Depth**"),
    flipper_length_mm = md("**Flipper Length**"),
    body_mass_g = "Body Mass, g",
    island = "Island",
    year = "Year"
  ) %>%
  tab_options(
    heading.align = "left",
    row_group.font.weight = "800"
  )

pt
```

Penguin Anatomical Changes

By species, island, and year from 2007-2009

		mean anatomy measures in mm			
Island	Year	**Bill Length**	**Bill Depth**	**Flipper Length**	Body Mass, g
Adelie					
Biscoe	2007	38.3	18.4	181.7	3,620.0

Biscoe	2008	38.7	18.1	189.6	3,627.8
Biscoe	2009	39.7	18.6	192.4	3,857.8
Dream	2007	39.1	18.7	186.5	3,671.2
Dream	2008	38.2	18.3	192.0	3,756.2
Dream	2009	38.1	17.7	191.2	3,651.2
Torgersen	2007	38.8	19.0	189.3	3,763.2
Torgersen	2008	38.8	18.1	191.8	3,856.2
Torgersen	2009	39.3	18.0	192.9	3,489.1
Chinstrap[1]					
Dream	2007	48.7	18.5	192.4	3,694.2
Dream	2008	48.7	18.4	197.7	3,800.0
Dream	2009	49.1	18.3	198.1	3,725.0
Gentoo[1]					
Biscoe	2007	47.0	14.7	215.1	5,070.6
Biscoe	2008	46.9	14.9	217.6	5,019.6
Biscoe	2009	48.5	15.3	218.4	5,140.7

[1]Only found on a single island.
Source: Very cold nights.
Reference: Horst AM, Hill AP, Gorman KB (2020). palmerpenguins: Palmer Archipelago (Antarctica) penguin data. R package version 0.1.0. https://allisonhorst.github.io/palmerpenguins/

1.3 To see the colors and other features we need to save the table as an image

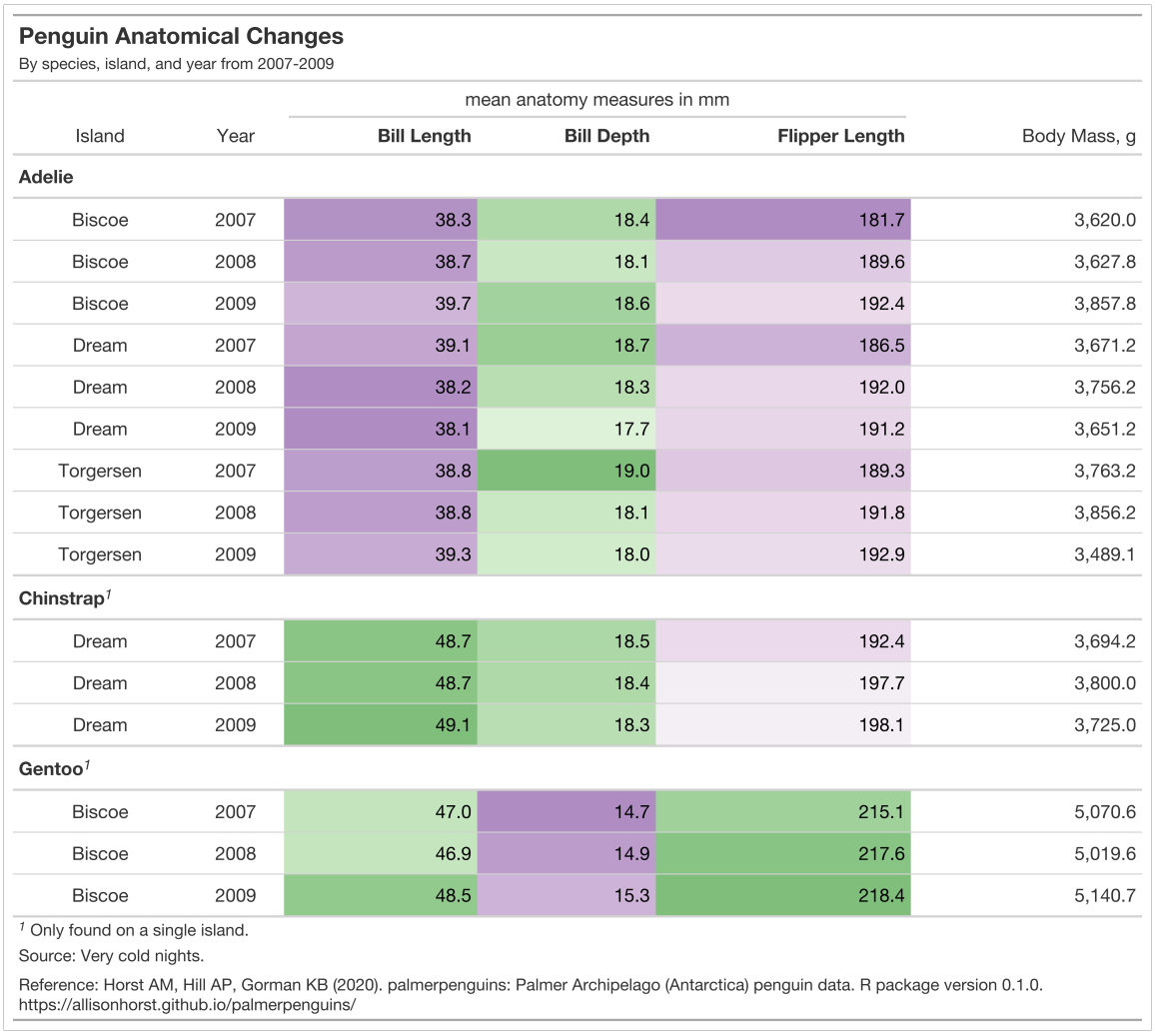
Notice `invisible`. Even though `gtsave` has no visible output, the table will show here in the PDF if we do not wrap it in `invisible`. In our case we want to show the table somewhere else in the PDF.

```
# need to install webshot and also run webshot::install_phantomjs() before
# saving as image, and need to wrap in invisible() so the table will not render
# in output here because we want to use it elsewhere
invisible(
  gtsave(pt, "pt_as_image.png", expand = 25, zoom = 6)
)
```

1.4 Then we read the image back into the file where we want to use it

And html elements show

```
knitr::include_graphics("pt_as_image.png")
```



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2 Your turn! To get started:

- quarto.org
- gt
- gtExtras
- palmerpenguins