

HW2

Summary

We are going to produce an R package with functions with documentation. The application is functionality to visualize and process data and estimates on family planning worldwide. Note that we already developed the function in HW1. We will further work on it and wrap it up in an R package in this HW2.

What to hand in

Please submit your zipped package and associated files described below. The submission needs to contain:

1. an R package that includes the functions needed for the HW exercises, including documentation for the function `plot_cp`
2. an R notebook called `hw2_exercises.Rmd` and associated knitted html that shows the function calls and output as displayed in the hw2 starter Rmd/pdf with example solutions.
3. a link to your GitHub repo, which contains your package, Rmd, and knitted html file.

Grading: 25 points

- 10 points for exercise 1
- 10 points for exercise 2
- 5 points for exercise 3

```
# to load your package  
# my package is called hw2  
# load_all("../hw2")
```

HW2 exercises

In HW2, we are going to set up a package and add the plotting function, called ‘`plot_cp`’, which is developed in HW1.

Exercise 1: Function call in R packages

You should put your data files under `data` folder within your R package.

The data set csv file `contraceptive_use.csv` contains observed mCPR values. Relevant variable info is as follows:

- `contraceptive_use_modern` = observed mCPR
- `division_numeric_code` = country iso code

- `is_in_union == "Y"` refers to observations among married women.
- $(\text{start_date} + \text{end_date})/2$ is the reference time for the observation.

Extend the plotting function to produce the plots below, with additional arguments `CI`, which indicates what uncertainty interval to plot, or none uncertainty intervals shown when `CI` is set to be missing.

The first plot shows mCPR (%) among married women against time in Afghanistan (country iso code 4) as before but with observed data added from `contraceptive_use.csv`. Dots are observed data, lines are point estimates and the shaded areas represent 95% uncertainty intervals.

The second plot shows mCPR (%) among married women against time in Afghanistan (country iso code 4) without uncertainty intervals.

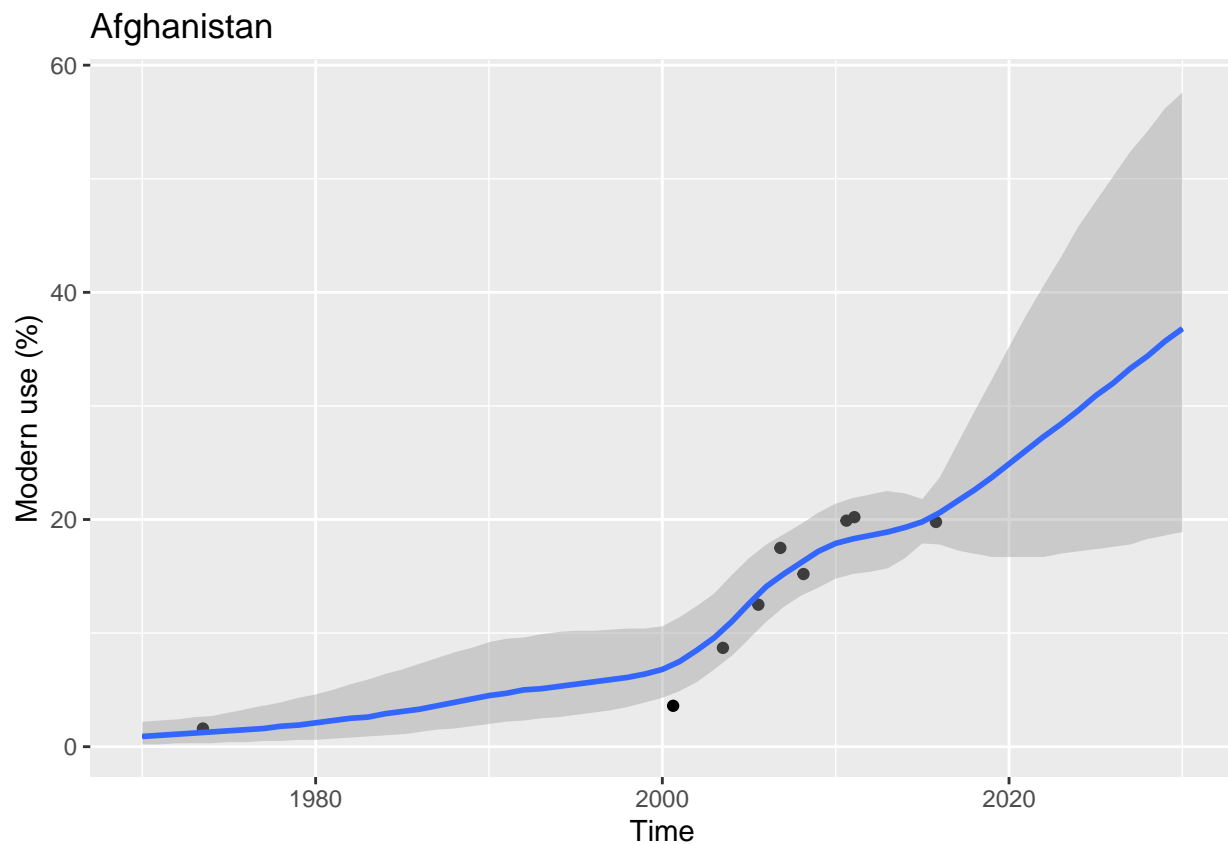
The third plot shows mCPR (%) among married women against time in Kenya (country iso code 404) with the shaded areas representing 80% uncertainty intervals.

Note that in the example solution, `dat` refers to the processed data set with variables `iso`, `year` (referring to reference year), and `cp` (`contraceptive_use_modern * 100`).

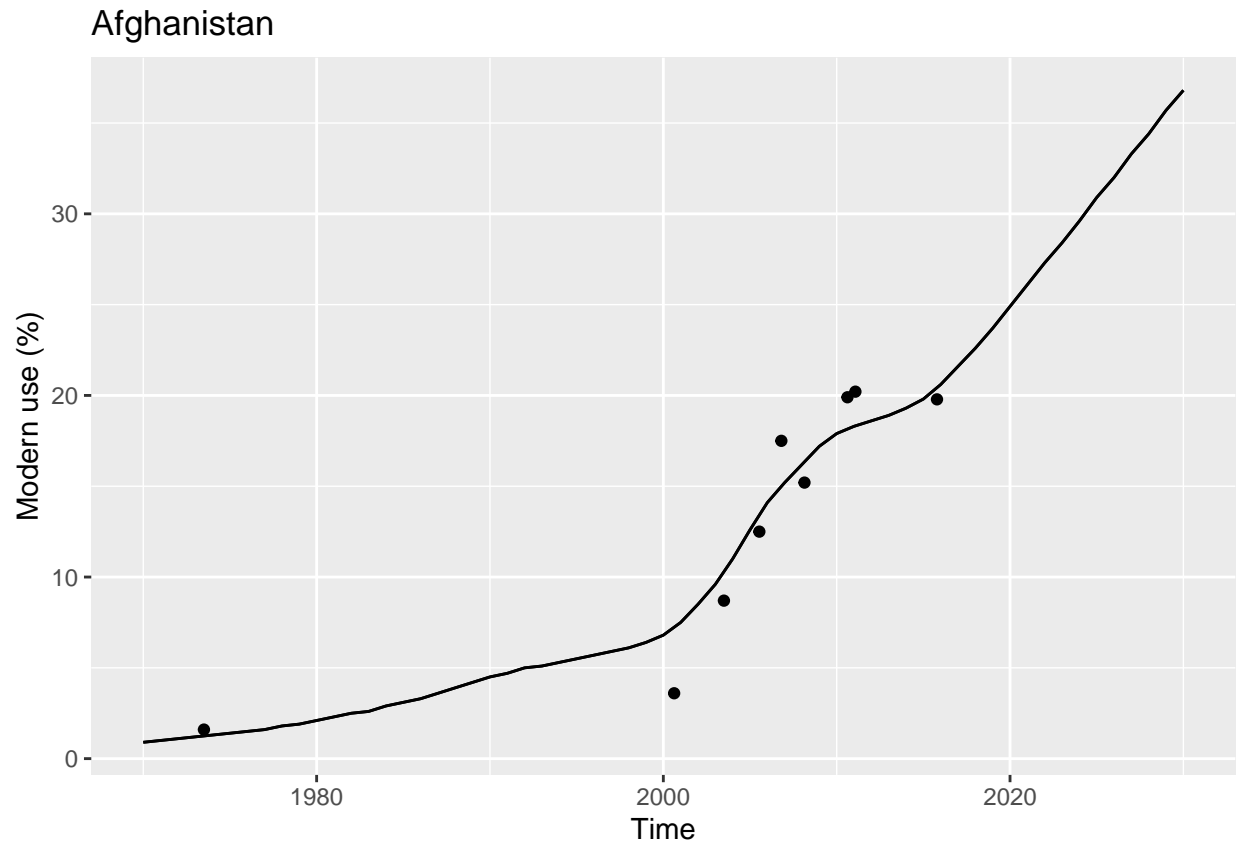
In this HW2, you should not define the `plot_cp()` in this Rmd. Instead, you should define it in `R/plot_cp.R` file and load it by `load_all()` function call before.

You should be able to replicate the following plots:

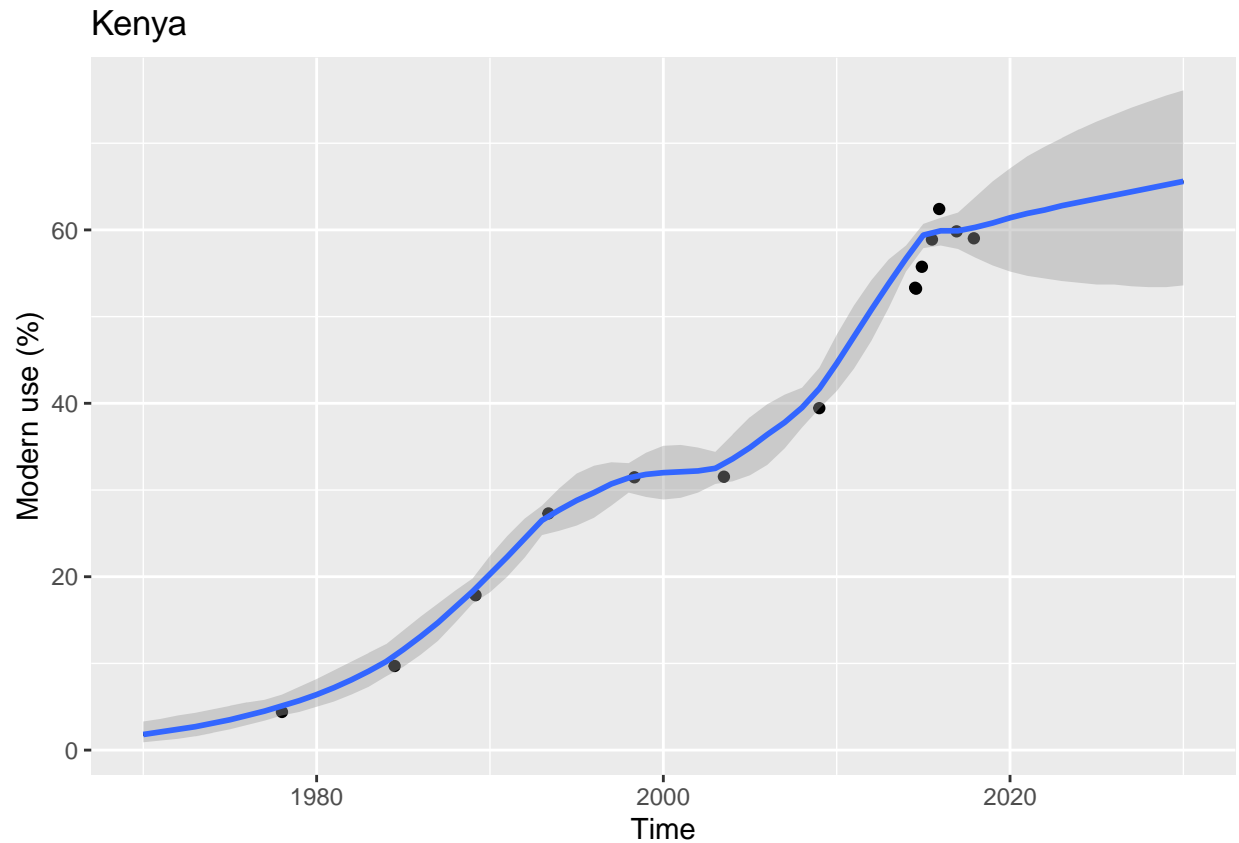
```
plot_cp(dat, est, iso_code = 4)
```



```
plot_cp(dat, est, iso_code = 4, CI = NA)
```



```
plot_cp(dat, est, iso_code = 404, CI = 80)
```



Exercise 2: Add documentation

Document the arguments and output of `plot_cp`. To do that, add a helpfile (.Rd file in subfolder `man`) using the approach from the class material “documenting an r package”:

- add roxygen skeleton to the `plot_cp` function, fill in the details
- use the function document to generate the Rd file

In order to show the help file in the knitted Rmd, install the package `Rd2md` and use this code block:

```
library(Rd2md)
Rd2markdown(rdfile = "man/plot_cp.Rd", outfile = "plot_cp.md")
```

Below is an example help file.

Plot mCPR data and estimates

Description

Plot mCPR data and estimates

Usage

```
plot_cp(dat, est, iso_code, CI = 95)
```

Arguments

- **dat**: tibble which contains mCPR observations. Columns: iso, year, cp
- **est**: tibble which contains mCPR estimates. Columns: “Country or area”, iso, Year, Median, U95, L95
- **iso_code**: country iso code
- **CI**: confidence intervals to be plotted. Options can be: 80, 95, or NA (no CI plotted)

Value

ggplot object with data and estimates

Exercise 3: GitHub

Now it is time to share your work! Create a repo on your GitHub. Commit and push your package files, Rmd and knitted html to your repo. Paste the link to your GitHub repo below.

Note that in order to earn full credits, your GitHub repo commit history should show at least two commits.

Paste your link here. . .